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Editorial

As part of his epistemology and in his criticism of Heraclitus' theory of constant flux and the Sophists' world-view, the philosopher Plato argues, in a way that is as solid as it is graphic, that change has two dimensions. On the one hand, renewal and movement towards the creation of a new and hitherto unheard-of category; and, on the other, partial permanency, which maintains links with the essence, with the innermost parts of what comprises the being, thus configuring it as an identifying and distinctive factor. According to Plato, this is how the idea of *movement* makes sense, in contrast with that of *replacement*, which has various consequences for practical life.

Some lines by the Colombian writer and photographer Andrés Hurtado also illustrate this well. In his book *Cartas del camino* (*Letters from the path*, 2013), he describes the potential elevated horizons that open up to us during our watchful journey along new pathways over the passage of time:

Somewhere it waits for you.

Set off now, my little nomad!

Abandon the usual pastures.

Give up your plots of land and, thus,

naked as all new-borns,

one day you will know

the watering places of the eagles.

The conjunction between this Platonic idea and these hopeful lines is appropriate for defining the moment the **Revista Española de Pedagogía (REP)** finds itself in, more than eighty years since its creation: namely, in a gradual transition, with a constant view to improving and staying up to date while, at the same time, aspiring to maintain high standards of quality and an equilibrium between its identity as an academic journal with a long tradition in the area of pedagogy.

With this dual aim, in recent months, we have launched a number of initiatives, which will be joined by others under the framework of the principles of *internationalisation*, *openness*, and *improving the quality of management*. So, we have expanded and updated our editorial team, adding researchers from different universities and geographical locations, making it possible to continue to consolidate the international scope of the research we publish. At the same time, this restructuring has required a review of our internal processes with the aim of improving and guaranteeing the editorial quality of our journal and its relationship with potential authors, reviewers, and the different members of its committees.

We have also launched a significant digitalisation process that is implemented at various levels. Thus, from January 2024, the journal is published digitally in open access, with whole issues and articles being available online, from the first work (published in the **REP** in 1943 by the Catalan psychologist and pedagogue Fernando M.

Palmés, and titled "Technique of memory in the learning process") up to the present day. This means the end of subscriptions and the sale of printed copies, placing us in line with the majority of academic journals in the countries surrounding us.

Lastly, our web page will undergo a significant update with the aim of modernising the **REP**'s. A more in-depth innovation will be additionally put in place. This will fundamentally affect our authors and reviewers, as it comprises the use of a platform for managing submissions in their entirety, from reception to review and notification.

In the rough scientific waters that academic journals navigate nowadays, we trust that these measures will to help maintain our readers' interest in the **REP**. Also to increase the journal's appeal for new researchers from around the world, owing to its accessibility, visibility, breadth of distribution, transparency and the ease of use of the management resources. All this without losing sight of our academic responsibility when faced with the high demands of quality educational research in the works we publish.

Elias Said-Hung and Juan Luis Fuentes

Directors

Satan's virtues: On the moral educational prospects of fictional character

Las virtudes de Satanás: perspectivas de educación moral del personaje de ficción

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Abstract:

Recent attention to character formation as the key to moral education has also regarded personal and fictional role models as appropriate means to this end. Moreover, while one may have grave reservations about the influence of personal role-models (perhaps upon the young by those they happen to admire), serious fiction has often been considered an inspirational source of moral example. Still, while this paper ultimately mounts a defence of the moral educational potential of literature, it is also concerned to press two significant reservations about any and all attention to fictional character as a means to such education. First, since the ultimate meaning of any fictional character and conduct is largely, if not exclusively, confined to their narrative contexts, we should not suppose them to have any direct role-modelling application to the affairs of human life beyond such contexts. Second, and more significantly, since morality is also ultimately more than and/or not entirely reducible to the contingencies of human character, attention to either fictional or real-life character must anyway fall somewhat short of full moral education.

Keywords: literature, fiction, character, virtue, moral education.

Resumen:

El interés reciente por la formación del carácter como aspecto clave en la educación moral ha llevado a considerar también los modelos de referencia personales y ficcionales como medios apropiados para este fin. Además, aunque uno pueda albergar serias reservas con respecto a la influencia de los modelos de referencia personales (quizá la que ejercen sobre los jóvenes las personas que estos admiran), la ficción seria se ha visto a menudo como una fuente inspiradora de ejemplo moral. Aun así, a pesar de que este artículo defiende el potencial de la literatura como promotor de la educación moral, también expresa dos reservas importantes sobre la atención dedicada a los personajes de ficción como medio para dicha educación. En primer lugar, puesto que el sentido final de cualquier personaje y conducta ficcionales está, en su mayoría (si no en exclusiva), limitado a sus contextos narrativos, no deberíamos asumir que tienen alguna aplicación directa como modelo de referencia en los asuntos de la vida humana fuera de esos contextos. En segundo lugar, y aún más importante, puesto que la moralidad es, en última instancia, algo más que (o no reducible totalmente a) las contingencias del carácter humano, la atención a un personaje de ficción o de la vida real no es suficiente, en cualquier caso, para una educación moral completa.

Palabras clave: literatura, ficción, personaje, carácter, virtud, educación moral.

"Poetry is something more philosophic and of graver import than history, since its statements are of the nature more of universals, whereas those of history are singulars. By a universal statement I mean one as to what such or kind of a man will probably or necessarily say or do, which is the aim of poetry."

(Aristotle, 1941a, p. 1464)

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"We touch here on a central dilemma of literature. If literature is didactic, it tends to injure its own integrity; if it ceases wholly to be didactic, it tends to injure its own seriousness."

(Frye, 1974, p. 169)

1. Theorising moral education

Briefly, the dial of modern academic thought about moral learning and education seems to have swung between two apparently opposite poles of attention to rational thought and principle on the one hand and focus on character and practical conduct on the other. The former emphasis on thought and principle, under the (probably main) influence of sociologist Emile Durkheim (1973) and psychologists Jean Piaget (1932) and Lawrence Kohlberg (1974), was to dominate moral educational theorising for much of the twentieth century. For all these theorists, it was basically an application to educational practice of the deontological ethics of the philosopher Immanuel Kant. On this view, moral development is largely a matter of cultivation of rational respect for universal principles of other-regarding rights and justice. On the other hand, the emphasis on moral education more as the psychological cultivation of character and correct practical conduct, while undoubtedly drawing some inspiration from the learning theory of early twentieth century (Russian and American) behaviourism, seems to have been largely a late twentieth-century reaction to what was perceived as the excessive rationalism and intellectualism and insufficiently practical focus of cognitive developmental theory (see, for example, Ryan & Bohlin, 2003; Lickona, 2004).

A moment's thought, however, should suffice to show that any extreme swing of the pendulum between moral reason and practical conduct is hardly helpful and that responsible moral agency (as in the case of other human action) cannot be other than appropriate conduct in the light of some form of reason. In this light, it has seemed for many contemporary theorists of moral education that final reconciliation of any and all oppositions between moral educational reason and conduct is to be found in a recently revived ethics of virtue drawing mainly on Aristotle's *Nicomachean ethics* (1941b). On this view, to be sure, the key components of moral life, commonly referred to in Anglophone usage as *virtues* (via the Greek *arete* and the Latin *virtus*) are basically qualities of *good character*. Such qualities are considered good (morally and otherwise) as conducive to the human well-being or flourishing of Aristotle's ethically naturalist conception of *eudaimonia*. Virtues such as self-control, courage, justice and fair dealing shape or condition human conduct in generally positive or beneficial directions, whereas human vices, such as indiscipline, cowardice and deceit, are the source of human ill or harm. However, such virtues are not merely mechanical or conditioned routines or habits. Rather, they are discriminating responses to the needs or requirements of some particular human circumstances under the rational guidance of that *intellectual* virtue of practical wisdom to which Aristotle refers as *phronesis*. It is via the rational exercise of *phronesis* that we can come to appreciate that courage, for example, is not always a matter of mere fearlessness: in short, that as much moral error may lie in store from the insufficient fear or caution of recklessness as from the excessive fear of cowardice.

To be sure, this is something that we may know on the basis of familiar (empirical) human interactive experience: those who are characteristically self-controlled, courageous and respectful of the interests, rights and feelings of others are generally regarded as better and admired more than those who have no self-control, pluck or fellow-feeling. Still, while such considerations about good character appear well and good up to a point, they are far from morally conclusive or unproblematic. To start with, *phronesis*, or practical wisdom, may have its uses for the right psychological balance of rational perception and affect in (say) the proper exercise of courage; thus, for example, absence of fear may be as (morally or otherwise) bad as excessive fear. However, it is less than clear how it might serve well in advising us how to act in those not humanly infrequent circumstances of moral uncertainty wherein it is precisely unclear what we should do. Thus, for example, in the famous soliloquy of Shakespeare's *Hamlet*, the prince asks (presumably, about which is of more virtuous character): "Whether 'tis nobler in the mind to suffer the slings and arrows of outrageous fortune or to take up arms against a sea of troubles and by opposing end them?". Here, whatever *phronesis* may have to contribute to Hamlet's grasp of courageous action, it would hardly seem to help much towards advising what he should *do*. And, to be sure, Aristotle himself is fairly explicit that practical wisdom, as a form of *deliberation* rather than knowledge (Aristotle, 1941b), must fall short of any such advice in Hamlet's or like circumstances. Indeed, all that *phronesis* seems to offer to would-be virtuous agents is

the advice that there are no *general* rational principles whereby such moral questions might be decided and that what it *might* be right to do depends much upon the agent's particular context or circumstances. But this is not much help to Hamlet either: he could be as clear as day about his circumstances, but yet quite unclear about precisely whether he should or should not rightly slay his uncle and stepfather Claudius.

But it seems a no less serious problem about basing morality on some notion of good or virtuous character that, apart from the fact that agents of bad or vicious character may sometimes perform good actions, agents of virtuous or morally exemplary character can act badly or even wickedly. It is neither logically contradictory nor at odds with common experience that genuinely temperate, courageous (or even mostly other-regarding) agents may often behave in quite morally wrong or unjustifiable ways. To be sure, it may be insisted by some virtue ethicists that there can be no *genuine* courage, temperance or other virtues unless these character traits are directed towards *morally* justified ends (see, for example, Geach, 1977); and it is possible (though by no means certain) that Aristotle himself may have subscribed to some such *unity of virtues* thesis. Still, first, if this position is not just actually question-begging, it would certainly set an impossibly high bar for most if not all common ascription of temperance, courage or even kindness or forgiveness: it makes perfectly good sense to regard a bank robber as truly courageous person or as a genuinely kind father even though he is not good or virtuous in other respects. Secondly, however, it is far from clear how (on a strict virtue ethical perspective) any such *moral* justification might be grounded. For while Aristotle certainly explored the idea of justice as both as character trait and more general moral principle (supposing this to be one likely yardstick of the moral), it therefore seems hard to construe virtuous character as other than largely strict observance of the principle. But such dependency of character on principle would now seem to jeopardise the status of virtue ethics as a strict ethics of character. And it should here be recalled that Elizabeth Anscombe, the founder of modern virtue ethics, commended return to an Aristotelian ethics of character precisely in view of her rejection of any useful search for a more principled measure of moral value (Anscombe, 1958).

Moreover, if we are to agree with Aristotle that the human virtues (bearing in mind that ancient Greek virtue and virtues could be other than human) of his *Nicomachean ethics* are not innate, but acquired, this last point brings into quite sharp relief the problem of how such qualities of character might be developed through experience or education. To be sure, Aristotle affirms that regular practice of the virtues is a key mechanism of virtuous character formation, but this obviously cannot be in and of itself sufficient. Besides, primary focus on habit formation risks some relapse into cruder behavioural conceptions of character education and losing sight of the contextualised guidance of Aristotelian *phronesis*, or practical wisdom. Nonetheless, the same Aristotelian repudiation in the name of *phronesis* of any appeal to *general* principles of moral conduct, reinforced by Anscombe's later dismissal of the principled ethics of duty (deontology) and utility (utilitarianism or consequentialism) of her day, would also seem to leave the nature of virtue acquisition no less uncertain. In short, if virtuous character needs to avoid the devil of habituation to fairly routine patterns of behaviour on the one hand and the no less undiscriminating deep blue sea of appeal to general moral principles on the other, how are aspiring virtuous agents to learn or acquire the more context-sensitive patterns of practical deliberation and judgement that serve to define genuine virtuous agency? Indeed, bearing in mind here that the virtues of good character are far from synonymous with *moral* conduct, by what measure might such judgements count as moral rather than (say) merely prudential or instrumentally opportune?

2. The prospects of moral learning from character

In the event, those drawn to the contemporary virtue ethical focus on qualities of so-called good character as the heart and soul of human moral life are inclined to regard something like close (empirical) encounter with or observation of the motives and conduct of others as the key means to moral learning. In short, on this view, effective moral learning crucially requires exposure to the moral example of others via the process that is usually referred to as role-modelling. Indeed, it might here be noticed that the function of role-modelling in moral learning has been strongly reinforced in latter day virtue ethics by a theory of so-called "exemplarism" (Zabzebski, 2010, 2013; for insightful criticism, see Szutta, 2019) that takes *admiration* of others to be the key mechanism of moral learning. To be sure, this perspective may appear compelling insofar as it seems undeniable that much moral learning does evidently follow from the influence of others, especially

those to whom the young are exposed in the persons of such early custodians as parents and teachers. This, in turn, speaks strongly in favour of some social and professional case for ensuring, as far as possible, that such early carers are persons of decent and responsible character and conduct (see, for example, Carr, 2007). Still, this line of argument may seem to be little more than question-begging and to put the empirical cart of admirable or imitable character before the horse of moral or normative appreciation. For how is the potential moral learner to recognise that those to whom they are exposed as appropriate role models come up to reputable moral scratch? Indeed, the very social and professional case for trying to ensure that early carers are morally respectable agents itself rests upon the commonly accepted fact that the influence of other people can be as often for moral ill as good: it is all too clear, from the slightest acquaintance with past human history and contemporary global politics, that very large numbers of people have been and continue to be all too easily influenced by persons of the worst possible human character and conduct in the course of close or more remote encounter, and thereby prompted towards the perpetration of unspeakable human injustices and atrocities. (For recent criticism of role-modelling approaches to moral education, see Carr, 2023a.)

That said, virtue ethicists and other would-be character educators have been drawn to another rather less immediately personal but clearly time-honoured route to good or virtuous character formation via the exposure of young or old to the rich heritage of literary narrative. A literary narrative which, from the earliest days of oral and written storytelling, has invariably been directly concerned with often detailed exploration of the consequences for (moral or other) good or ill of human psychology and agency. Thus, while moral and educational advocates of more normatively principled deontological, or consequentialist, ethics (of precisely the sort condemned by Anscombe) have been largely indifferent to past literature as a potential means to moral education, philosophers interested in character as a key engine of moral agency have been increasingly attentive to this possibility or prospect. One notable example is the distinguished twentieth century philosopher and popular novelist Iris Murdoch. While more influenced by Plato than Aristotle and perhaps not a virtue ethicist of recent stamp, she has clearly defended non-literal narrative or fiction as a key means to human understanding of the moral implications of character in both her philosophical and fictional writings (Murdoch 1970, 1973, 1997). For another, the highly influential (especially with regard to various forms of educational and other applied ethics) contemporary virtue ethicist Alastair MacIntyre has insisted that fictional literature and narratives (as distinct from the descriptive literature or discourse of this or that empirical scientific enquiry) reflect or constitute the basic logical form of human self-understanding in terms of moral agency (MacIntyre, 1981). On such views, we may stand to learn much if not everything about good or bad human motives and conduct and what makes them so from close attention to the past and present imaginative works of Euripides, Shakespeare or Tolstoy (which may also serve to explain why such fictions have so often found their way into the educational curricula of many if not most schools).

This general perspective on the moral educational significance and prospects of what has been celebrated as great or serious literature merits serious attention. Various defences of this view, such as so-called ethicism (Gaut, 1996) and moderate moralism (Carroll, 1996, 1998), have lately appeared in the literature of aesthetic theory. That said, this view is neither uncontested, entirely well formulated nor problem-free (especially in any overstated form). In this light, we may for the moment briefly notice and dismiss the general drift of one familiar objection to the moral educational potential of literature from the direction of so-called aestheticism. Aestheticism (defended of late with specific regard to fiction by Peter Lamarque; see, for example, Lamarque & Olsen, 1990, or Lamarque, 1996) is the source of two main complaints about any suggested moral educational use of literature. First, insofar as fictions are artworks, no reading of them for the purpose of moral edification may amount to genuine literary appreciation. Second, insofar as such works are imaginative creations, they cannot be expected and must fail to shed much if any light on real human moral issues. Indeed, far from shedding further light on human moral concerns, the ascription of moral significance to any fictional literature would appear to *presuppose* some already existing moral perspective on the part of readers. For present purposes, however, the key flaw of aestheticism would seem to be some serious conflation of the fairly distinct concepts of the artistic and the aesthetic; indeed, of effective reduction of the former to the latter.

Briefly, for present purposes, while the distinction between the aesthetic and the artistic has been variously made in recent times (see, for example, Best, 1982;

Hepburn, 1984; Carroll, 1986; Carr, 1999; Stecker, 2005; McFee, 2005), it is clear that there are objects or events of aesthetic concern (such as sunsets or birdsong) that are of no artistic point or significance. And (at least notionally) there are artistic concerns or achievements (such as some *conceptual* works) of little or no aesthetic import. To be sure, there is some danger of overstating this distinction insofar as artworks entirely devoid of aesthetic qualities (such as perhaps Cage's *4'33"*) seem to be also the exception rather than the rule. Still, it seems safe enough to say that while most literary artists are concerned to give aesthetic form to their works, they are also mostly concerned to express something of substantial artistic point substance. Unlike sunsets or birdsongs, literary works such as poems, novels or plays invariably have some dramatic, psychological, moral or other point or purpose. Thus, while such poets as Wordsworth, Yeats and Eliot; such dramatists as Euripides and Shakespeare, and such novelists as Austen, Dickens and Dostoevsky are evidently creators of works of aesthetically significant shape and form, they are no less clearly concerned to express or convey substantial points or lessons to readers about the world, human association and psychological, moral or other human nature. Indeed, any failure to appreciate this would clearly miss the artistic point of such works almost entirely. This said, unlike (say) histories or newspapers, it is not the main point or intent of artworks to report or comment directly on the happenings of everyday human life and association. To this extent, there would still seem to be something in the aestheticist objection to which we will need to return following some attention to the moral prospects and limitations of any and all attention to the fictional depiction of human character.

3. Fictional attention to human virtuous and other character

There cannot, of course, be much doubt that books (of all kinds and genres) comprise much of the educational input of modern literate societies and cultures. To be sure, while some of this literature has sought to transmit scientific and technical knowledge of human material or economic progress, much has evidently been concerned with the wider moral and spiritual formation of societies and cultures. Thus, the Christian Bible and Shakespeare have been jointly cited as the basic texts of western civilization. That said, the plays of Shakespeare and other great literary figures of the western canon, beginning perhaps with Homer and the classic Greek tragedians, are evidently works of *fiction*; as, indeed, the Christian Bible is also likely to be considered by many, if not most people, in the secular climate of contemporary western society. Thus, on one extreme view, it may be said that such works could or should have no significant influence on anything of much modern concern. As already noted, however, the virtue ethicist Alasdair MacIntyre has compellingly argued (broadly in the spirit of Aristotle) that the creative and imaginative narratives of received culture are rich and indispensable sources of moral and spiritual wisdom to which human agents cannot avoid turning for guidance. From the very dawn of humanity, on this view, such narratives have been the main source or vehicle for exploration of the complexities of character, motive and conduct (even where these have been attributed to non-human agents or animals) as implicated in the human search for ultimate purpose and meaning in life.

In this light, MacIntyre (1981) regards narrative as the basic logical form of human moral understanding of self and others: as he puts it, humans essentially understand themselves as characters in stories. Again, however, this view has also been echoed by other moral theorists and is perhaps most significantly anticipated (though, from a rather different Platonic perspective) by the distinguished twentieth century philosopher and novelist Iris Murdoch. More precisely, Murdoch argued that novelists should regard it as the very purpose of fictional work to explore the moral complexities of human character and association, and professed this to be her aim in her own fictional work. While this view would appear somewhat overstated (since novels and other fictional literature have often set out with the rather less ambitious purposes of entertaining or exploring other aspects of human life), it is nevertheless consistent with a time-honoured perspective on the role of fiction and drama in the economy of human moral edification. Hence, exploration of moral character, association and conduct have certainly had a large, if not pre-eminent, role in the works of such authors of the western canon as Sophocles, Euripides, Shakespeare, Cervantes, Jane Austen, Charles Dickens, William Thackeray, Thomas Hardy, James, George Eliot, D. H. Lawrence and countless others.

Still, alongside his defence of imaginative literature as a prime vehicle of moral and spiritual narratives, MacIntyre also embraced (at least in his early and more influential major works) a non-naturalist

ethics according to which virtues are socially constructed products of essentially rival cultural and moral traditions that have also often diverged to the point of direct opposition or conflict. Hence, while still following Aristotle in construing virtues as integral to, or constitutive of, human flourishing, divergent or rival social and cultural traditions have often enshrined or celebrated different virtues or moral priorities. While this case is made by MacIntyre mainly by reference to past cultural, theological and philosophical trends (for example, in terms of the contrast between the *heroic* virtues of past pre-modern societies and the more compassionate virtues of Christendom, or between the Christianity and pagan Aristotelianism that Aquinas sought to reconcile), such moral divergence might well be expected to show up quite as conspicuously in past and present literature (and he does illustrate this by reference to Icelandic sagas and other literature). As I have elsewhere argued (Carr, 2017), Macintyre's overall presentation of this case seems questionable on the grounds that, while human literary works could be hardly other than products of their historical socio-cultural contexts, it is nevertheless apparent that the work of most past great authors (such as those already cited) is often notable for its *moral critique* of the values of such authors' own societies. All the same, it appears that attention to imaginative literature does indeed reveal quite dramatic conflicts and ambivalences between conceptions of virtue and moral flourishing, ancient and modern, that also seem quite beyond MacIntyrean or other (not least Aristotelian) resolution.

There can also, of course, be little doubt about the enormous economic, social, cultural and other changes that have overtaken human life and association (perhaps most notably in developed western countries) from antiquity to the modern day (for brief notice of these, one might need only consult Marx's *Communist manifesto*.) With respect to present literary concerns, however, we might observe two crucial periods of western European history. The first of these is the period of complex transition from medieval feudalism to modern industrialism that is generally termed the Renaissance. While, on the one hand, often nostalgic for the ideals and learning of classical antiquity, it is also a period of shifting post-medieval social and economic trends and of a new humanism of scientific discovery and artistic creation. This general period is witness to the emergence of writers of such enduring stature, impact and importance as Thomas More, Edmund Spenser, Shakespeare, Cervantes, Francis Bacon and Christopher Marlowe, whose works variously reflect such social and economic transition from the medieval to the modern (as evident, for example, in emerging class tension between an older feudal aristocracy and a rising economically powerful mercantile bourgeoisie).

Clearly, however, the other highly significant revolutionary episode of European history, occurring around the height of the Renaissance, was the Reformation. Thus, from its early sixteenth century origin, rejection of the traditional hegemony of the Roman church by various movements of religious reform also resulted (along with much bloodshed) in social, cultural, moral, spiritual, intellectual (and, inevitably, literary) ferment and revolution from one end of Christendom to the other.

In this light, one author whose work perhaps more than any other reflects the cultural and intellectual turmoil, tensions and ambivalences of such times (particularly in his own politically and religiously divided country) is the English poet John Milton. The moral and spiritual tensions and ambivalences in Milton's work are plain enough. On the one hand, as an advocate of religious reform, Milton aspires to purify Christian faith of what he and other reformers construe as the tyrannical and oppressive abuses of Roman ecclesiastical hierarchy. However, he does so without any fundamental rejection of the essentially authoritarian Christian narrative of sin through disobedience and redemption via (according to much Protestant theology) fairly arbitrary divine grace and forgiveness. On the other hand, however, as a proto-liberal champion of freedom of conscience, thought and speech, Milton is also an advocate of religious and political dissent from unwarranted or arbitrary (especially secular) authority or coercion.

Once these two inclinations or commitments on Milton's part are made explicit, their evident tensions or conflicts are not hard to see. They are also conspicuously apparent in the literary work for which Milton is best remembered: his remarkable blank verse epic *Paradise lost*. To begin with, it is fairly evident that the rebel angel Satan is the most prominent and memorable character of Milton's poem (if not, indeed, its actual hero). To be sure, Satan is on the wrong side of the Christian religious tracks and his downfall (in line with orthodox Christian theology) is attributed to his disobedience of a benevolent and merciful God. In this regard, Milton's narrative has Satan confessing at one point to his ingratitude for God's favours: "What could be less

than to afford him praise. The easiest recompense, and pay him thanks. How due! Yet all his good proved ill in me. And wrought but malice" (Milton, 2005).

On the other hand, Satan (in more the patrician spirit of Aristotle) seems to see no compelling reason for gratitude if divine or other benefits are bestowed *de haut en bas* by imposed, if not arbitrary, authority: "Lifted up so high, I denied subjection, and thought one step higher would set me highest; and in a moment quit the debt immense of endless gratitude, so burdensome still paying, still to owe" (Milton, 2005).

At all events, leaving aside for the moment his theologically ambivalent stance, the most striking feature of Satan is that he is a courageous rebel who is unwilling to accept a destiny of submission to the will of others and a life that is not self-determined, authentic or self-determined. On the one hand, to be sure, such self-assertion or refusal of any authority may sometimes appear to be no more than misplaced or perverse pride, or *hubris*: indeed, the Devil's tempting of Christ to throw himself from the pinnacle of the temple in the gospel narratives is evidently the theological warrant for regarding Satan's pride in *Paradise lost* as the last, worst and most unpardonable of sins. But Satan's defiance of authority may clearly also be regarded as morally exemplary; as, precisely, a source of admirable virtues of courage, initiative and resilience in the face of unequal and (literally) hopeless odds and adversity. Moreover, to those with some acquaintance with literary traditions and trends prior and subsequent to *Paradise lost*, it is impossible to ignore the conspicuous (moral or other) literary predecessors and successors to Milton's Satan.

4. The devil's ancestors, disciples and heirs

It would seem that Satan's most conspicuous literary antecedent is the titan Prometheus of Greek myth, memorably dramatized by the tragedian Aeschylus in *Prometheus bound*. In defiance of Zeus, he stole fire to liberate humans from impotent submission to a divinely ordained state of nature. As Satan was punished by God to an eternity in hell, so Prometheus was condemned by Zeus to crucifixion and eternal torment by daily devouring of his liver by an eagle. To be sure, the obvious objection to any such parallel is that whereas the mythical rebel Prometheus was an apparent benefactor of mankind, Milton's rebel Satan plots the downfall of mankind by tempting Eve and subsequently Adam to disobedient consumption of the apple from the tree of knowledge. However, something may here depend on theological interpretation of the *Genesis* myth. For it seems that, in ancient gnostic pagan and Christian versions of the narrative, the mythical creator of Eden and its human occupants was not the supreme ruling spirit of the universe, but a local demiurge intent on keeping his creation in ignorant thrall to his arbitrary will. Thus, in *The Apocryphon of St John* (one of the non-canonical gospels discovered at Nag Hammadi in 1945), an explicit dialogue on the *Genesis* narrative occurs between the apostle John and Jesus the saviour in which the latter takes full responsibility for encouraging Adam and Eve to eat of the tree of knowledge by asserting "But I was the one who induced them to eat" (Meyer, 1998, p. 175.) On this ancient reading of *Genesis*, the original temptation opened up a spiritually progressive route to knowledge or wisdom (enabling freedom from the tyranny of a false deity). Thus, Jesus of the New Testament gospels appears as a teacher of the knowledge (*logos*, or Word) of the true world-transcendent God which aspires to replace and transcend the oppressive and repressive law of the Old Testament Jehovah. (Gnostic construal of the *Genesis* story us also evident in the cinematic narrative of the 1998 movie *Pleasantville*; see Carr, 2023b.)

Moreover, this gnostic take on the *Genesis* narrative is also fairly evident in the poetic works of the early modern English author and artist who was an ardent admirer of Milton: namely, the visionary painter and poet William Blake. Thus, in Blake's somewhat perplexing *Prophetic books*, some such overall gnostic drift seems evident in the general construction and *dramatis personae* of these complex narratives. On the one hand, Blake's Urizen (identifiable with the oppressive conventional morality of church and state and/or the cold rationality of Newtonian scientific reason) resembles the repressive demiurge of gnostic theology. On the other hand, such characters as Los (Urthona), Luvah and/or Orc are expressive (more or less respectively) of imagination, love and passion as largely opposed to such cold reason. Of course, the rebellious powers and sentiments opposed to Urizen are inspired more by the altruistic virtues of the canonical gospel Jesus than by Satanic pride. But Blake famously observed in his *Marriage of heaven and hell* that "Milton…was of the Devil's party without knowing it". His own work (along with that of such contemporaries as Wordsworth, Coleridge and Shelley) plays a significant part in fueling a new romantic literary sensibility of individual independence, self-determination

and emancipation from the repressive political, religious, economic and other influences and institutions of both traditional (feudal) and modern (industrial and capitalist) society and culture. To be sure, while the literary genius of early romantics may well have been expressive and supportive of the distinctively new modern politics of freedom and democracy pioneered by the likes of John Locke and Jean Jacques Rousseau, it should not be forgotten that Blake and Wordsworth were no less strongly opposed to the utilitarianism, philistinism and human degradation that the new political and economic liberalism of industrial capitalist exploitation trailed in its wake.

In this light, one cannot doubt that the new modern moral sensibility of earlier and later literary romanticism (broadly speaking, the main drift of fiction, drama and poetry from the late eighteenth century to the end of the nineteenth century, if not beyond) seems more sympathetic to the rebellious, self-assertive and iconoclastic virtues of Milton's Satan than to the Christian virtues of humility and service to others promoted by official eastern and western churches for the purpose of encouraging lower feudal orders to know and accept their subordinate place. Thus, despite all other significant and interesting differences, such major English nineteenth century novelists as Jane Austen, the Brönte s, Charles Dickens, George Eliot, Thomas Hardy (as well as their foreign counterparts) are much concerned to promote an essentially romantic project of liberation of their heroes and heroines from various constraints of social convention, class prejudice or patriarchy that prevent them from realizing their mature moral growth, individual potential or ambition. To be sure, it cannot be denied that the fictional worlds invented by these authors (in which their various self-affirming characters pursue their imagined destinies) are (even in the case of an evident non-believer such as Hardy) also informed by moral ideals and virtues of some Christian provenance. That said, it is fairly evident, as early as Matthew Arnold's mid-nineteenth poem "Dover Beach", that a major cultural and literary break with the traditional Christian moral basis of western culture is looming on the horizon.

Moreover, it seems plausible to trace the decisive break with traditional western European subscription to the moral authority, or truth of the Christian gospels (at least, in literary terms) to the work of the nineteenth century German philosopher Friedrich Nietzsche. While it is customary to regard Nietzsche as a founding father (perhaps along with Soren Kierkegaard) of twentieth century existentialism, he is no less aptly regarded as a philosophical spokesman of nineteenth century romanticism (itself a main source of much later existentialism). While it is also of considerable present interest that Nietzsche has lately been lauded as a type of virtue ethicist (Swanton, 2003), the virtues that he extolls could hardly be further away from the moral and theological virtues celebrated by (for obvious example) such major Christian theologians as St Thomas Aquinas. In short, Nietzsche's virtues are not at all the Christian virtues of love, humility and selflessness. On the contrary, they are significantly closer to Miltonian satanic (or perhaps, in the terms of later romanticism, Byronic) virtues of self-assertion, personal independence, revolutionary action, resistance to imposed authority and individuality of expression, showing thus much disdain for humility or servility of character. Indeed, Nietzsche's contempt for and dismissal of what he evidently considered to be the pusillanimous and feeble character of the specifically western Christian social morality of humility and selflessness could hardly be more evident:

> Our weak, unmanly social concepts of good and evil and their tremendous ascendancy over body and soul have finally weakened all bodies and souls and snapped the self-reliant, independent, unprejudiced men, the pillars of a *strong* civilization. (Nietzsche, 2012, p. 163)

Indeed, it is not merely that Nietzschean virtues seem significantly satanic, but that they are invoked and celebrated to the end of opposition to Satan's very own enemy, namely, the Christian God, whose final demise was also famously pronounced by Nietzsche. For many, of course, such radical departure from or opposition to received Christian faith and morality will be sufficient to dismiss the Nietzschean perspective as false, immoral and even demonic. In this light, the influence of Nietzsche's satanically virtuous *Übermensch* on the toxic twentieth century Nazi ideology will also no doubt spring to mind. That said, aside from his formative influence on the mid-twentieth century philosophy and fictional literature of existentialism, it is hard to think of a major literary figure of early to middle years of that century who was not influenced by some reading of Nietzsche, including, amongst many others, James Joyce, Henrik Ibsen, D. H. Lawrence, George Bernard Shaw, Eugene O'Neill, Oscar Wilde, W. B. Yeats, Thomas Mann, Hermann Hesse, Andre Gide and Albert Camus. Many new literary traditions (such as stream of consciousness fiction, the neo-symbolist literature of existentialism and

new social realist fiction) were also undoubtedly influenced by the problematization of traditional Christian morality of the new twentieth century climate of secularism, to which Darwin and Marx, as well as Nietzsche, clearly contributed. However, a large proportion of such post-Nietzschean literature is aptly construed as neo-romantic by virtue of its significant concern with themes of the human search for authentic identity, self determination and liberation from the shackles of convention pioneered by nineteenth century forbears. Thus, for example, the (especially female) protagonists of D. H. Lawrence are much exercised with the issue of escaping traditional patriarchal gender or sexual constraints in a way that is not at all dissimilar in spirit from the aspirations of Charlotte Brönte's *Jane Eyre*. Still, it may be that the Nietzschean quest for the uncompromising honesty and integrity of personal independence and authenticity is best captured by the declaration (as well as the actions) of Dr. Stockman in Ibsen's *Enemy of the people*, that "the strongest man is he who stands most alone".

At all events, this abundance of past and more recent fictional literature serves only to compound the immense difficulties in the way of efforts to discern any clear moral compass for human moral development via primary or exclusive attention to human character in the rich heritage of literary tradition. It cannot be doubted that much (if not all) ancient and modern imaginative literature has often primarily sought to plumb the psychological and moral depths and complexities of character in a potentially infinite range of individual and social contexts and circumstances. However, the greatest, most memorable and enduring of such literature has often been just as if not more concerned to explore the frequent ambivalence and conflict of such character and can rarely be taken (as aesthetic formalists are wont to complain) to provide certain or unequivocable advice of much direct relevance or application to everyday human life. Indeed, we are all too often shown how agents of many admirable qualities (such as Homer's Achilles) can be capable of morally bad or squalid conduct and those of weak, corrupt or deplorable qualities (such as Sydney Carton in Dickens' *A Tale of Two Cities*) may yet be redeemed by actions of morally positive or altruistic conduct. Thus, however sympathetic we may be towards the desire of Shakespeare's Hamlet (perhaps the most conflicted and ambivalent of all literary characters) for revenge on Claudius, it might well seem ill-advised to endorse his final murderous expression of this sentiment in similar circumstances (even if it might make any sense to speak here of *similar* circumstances). Likewise, however much we might admire Milton's Satan for his impressive courage and heroism (which the poet also shows to be mixed with other morally less desirable qualities), we might, at the very least, want to question the morality of the ends to which such qualities are directed. In any case, whether we finally judge such characters to be morally good or bad, right or wrong, will ultimately depend on moral values that we bring to such fictions rather than derive from them.

5. Conclusion: art is not life

While we have lately taken modern aesthetic formalism to task on the grounds of its misguided confusion between, or reduction of, artistic to aesthetic significance, we are nevertheless now better placed to comprehend the real point behind formalist or aestheticist resistance to artistic moralism or other *instrumental* construal of the ultimate ends or purposes of art. To be sure, insofar as extreme aesthetic formalism (of, as it were, art for art's sake) has often appeared to hold that genuine artistic appreciation must be exclusively focused on the intrinsic formal or aesthetic properties of artworks, it would seem to confine all significant art to (perhaps non-cognitive) entertainment or distraction. Thus, it precludes the prospect of much real human instruction or learning from literary or other art. But this clearly cannot be right. In the first place, as our second prefatory quote from Northrop Frye indicates, this risks emphasis on the integrity of fictions to the exclusion of their seriousness. In the second place, however, it also fatally ignores the crucial distinction between the language of history and other *descriptive* human literary contexts or purposes and its more *philosophical* deployment in poetry that Aristotle draws in our first prefatory quote from his *Poetics* (a work that may also be fairly considered the foundational text of western aesthetic theory).

To be sure, Aristotle's distinction is perfectly in line with a very basic tenet of much post-Kantian formalist and other modern aesthetic theory which aims to observe a quite fundamental distinction between the language or semantics of ordinary descriptive discourse (which is also employed in history or the sciences to report the contingent facts of past or present human experience) and the literary or other artistic language or semantics of human imaginative creation of, for example, tragedy or other art. Briefly, in the terms of modern analytical (post-Fregean) philosophy and log-

ic, the fictional language or narrative of imaginative artworks is *intensional* (not to be confused with *intentional*) rather than *extensional*. That is to say that, while the propositions that we encounter in a novel, such as Jane Austen's *Emma* or Charles Dickens' *Oliver Twist,* have evident *sense*, or meaning, within such fictional contexts, they do not (unlike the propositions of ordinary, historical or scientific discourse) have any *reference* to events in the actual world beyond such contexts. Thus, the narratives in which such propositions or (pseudo) statements occur are entirely the constructs or inventions of human *imagination* and should not be confused with the real world of empirical experience. Moreover, while this point might seem so trivial as to be hardly worth making, it is of quite wide-ranging educational import. To begin with, while most people of mature years will have little difficulty distinguishing the non-literal or fictional narratives of fairy story or Greek mythology from the purportedly factual reports of history or science, much modern mischief continues to be caused by failure to distinguish what are clearly the myths of past religious traditions (perhaps especially of the Old and New Testaments of the Christian Bible) from actual historical record. At all events, there can here be little doubt that this basic distinction of the non-referential language of art and fiction from forms of referential discourse lies at the heart of latter-day aesthetic formalist objection to any and all attempts to derive moral or other lessons from imaginative narratives.

That said, it seems no less mistaken to hold (as, at least, more extreme of such aestheticists appear to have held) that, because fictional narratives have no direct external reference, there can be little or nothing of any wider worldly value or relevance to be gained from them. Indeed, this is quite evidently *not* the position of Aristotle in our introductory quote, where he quite explicitly affirms that "poetry is something more philosophic and *of graver import* than history". Indeed, it might here be noted that, while some distinguished modern advocates of the educational significance of fictional literature (such as Iris Murdoch 1970, 1227) seem to have held that narrative fiction has more human relevance the closer it approximates to *real life*, it would to the contrary appear that the highest of literary regard has more often been accorded to works of evidently pure fantasy (such as Sophocles' *King Oedipus*, Milton's *Paradise lost* and Shakespeare's *The tempest*; not to mention the parables of Jesus) at the very farthest remove from any actual (empirical) human experience. This, to be sure, clearly underscores the general danger of failing to distinguish the real human significance of imaginative fiction from that of literal description. For while generations of readers have greatly profited by way of profound human insight from Swift's *Gulliver's Travels* or Cervantes' *Don Quixote* (without the least illusion as to the non-literal or figurative character of such stories), it is evident that many more have quite failed to appreciate the real human import or significance of the no less fictional narratives of *Genesis* or *Kings* by literal readings of these biblical books.

But then, how can stories or narratives that clearly do not report on or refer directly to actual human events or affairs be said to have meaning outside or beyond their distraction or entertainment value? On the face of it, Aristotle's more particular response to this question (at least, as applied to ancient Greek drama), in terms of the *cathartic* power of tragedy to purge or purify human emotions of pity or fear, may appear less than helpful. While it may be true up to a point that audiences are often moved in this fashion by tragedies or other literary narratives, this does not seem to be the case of all such works (though it would also appear that other works are instructive in ways that tragedy is not). Thus, the more generally compelling Aristotelian point evidently lies in his understanding of the language of poetry or other literary art (as distinct from that of history) as concerned with the *universalization* or *typification* more than description of human actions or affairs. Following Aristotle's lead, the great twentieth century literary critic Northrop Frye usefully distinguishes the language and idioms of imaginative literature from the descriptive discourses of science and other more literal enterprises as "myths of concern" (Frye, 1974). It should also be clear here that Frye is here strictly faithful to Aristotle's own use of the term *myth* to denote the stories or narratives of his purely imaginative and fictional poetry. In these terms, while such purely fictional constructs can have no direct reference to human actions or affairs (and it would be a dire mistake to assume they have such application), they may yet be potent sources of human instruction or education by way of the characteristic poetic devices of metaphor, analogy, parable, allegory, satire, irony and other imaginative, semantic and conceptual tropes and idioms that are no less clearly vehicles of insight into the human condition. So, while it would be mere folly to construe Swift's *Gulliver's travels*, Cervantes' *Don Quixote* or Kafka's *The trial* as reporting on actual historical events, we may yet stand to learn much about human folly as such from the large and small

characters of Swift's *Gulliver*, about true human wisdom and humanity from Quixote's apparent madness, and about the potential dystopian nightmare of human bureaucracy from the fictional fate of K in Kafka's frightening parable.

With regard to particular present concerns about moral learning from literature, then, we clearly need to distinguish two different respects or levels in which fictional literature may be implicated or embroiled in moral (or, more specifically, character education). On the one hand, we do need to take on board aestheticist, or formalist, caution against drawing any clear directly applicable conclusions for everyday practical conduct from imaginative poetry or literature. Apart from the consideration that the characters of fictional narratives are just precisely *characters* in *stories* (so that the conduct attributed to them can have real point or purpose only in the context of such stories), we have seen that no very reliable moral conclusions can be drawn from either real or fictional perceptions of human character and that any such judgements that we may apply to them must derive from other sources of reflection. Indeed, as the introductory quote from Frye implies, insofar as the primary aim of fiction or other art is not to describe the actual world but to construct imaginative possibilities, it is actually liable to artistic failure if it explicitly professes any non-artistic and propagandist function (as in the case perhaps of much so-called social realist painting). Still, all this said, any extreme formalist or aestheticist denial of the moral significance or value of fictional literature is no less clearly belied by the Aristotelian distinction of the *philosophical* purposes of poetry from the descriptive function of history. Thus, while the *heroic* Satan of Milton's *Paradise lost* (or other literary figures) may afford us little direct practical guidance for conduct in the non-fictional world, this fictional character, as well as others, can nevertheless provide rich food for philosophical thought on the wider and more general conceptual or normative contours of potentially human character and conduct. This might well be put by saying that although we would not be well-advised to seek practical *instruction* on character and conduct from Milton's Satan, one may yet regard *Paradise lost* as a potent source of *education* concerning the wider and more principled normative and moral contours of human life. In this regard, indeed, such more *philosophical*, objective or *disinterested* acquaintance with great literary works may also serve to avoid the potentially lethal hazards of currently vaunted personal role-modelling approaches to moral and character education, which clearly risk exposing the young or gullible to quite the wrong sorts of undesirable influence from others (Carr, 2023a). But while Milton's masterpiece may persuade us that Satan has virtues of some such loose designation, we may therefore also hope to gain from the wider context and scope of this powerful narrative (and by comparison of this character and his story with those of other great fictions) a broader or more *educated* vision of the limits and defects of human character and conduct as such.

References

Anscombe, G. E. M. (1958). Modern moral philosophy. *Philosophy*, *33* (124), 1-19. http://www.jstor.org/stable/3749051

Aristóteles. (1941a). De Poetica. In R. McKeon (Ed.), *The basic works of Aristotle* (pp. 1455-1487). Random House.

Aristóteles. (1941b). The Nicomachean ethics. In R. McKeon (Ed.), *The basic works of Aristotle* (pp. 927-1112). Random House.

Best, D. (1982). The aesthetic and the artistic. *Philosophy*, *57* (221), 357-372. https://doi.org/10.1017/S0031819100050968

Carr, D. (1999). Art, practical knowledge and aesthetic objectivity. *Ratio*, *12* (3), 240-256. https://doi.org/10.1111/1467-9329.00090

Carr, D. (2007). Character in teaching *British Journal of Educational Studies*, *55* (4), 369-389. https://doi.org/10.1111/j.1467-8527.2007.00386.x

Carr, D. (2017). Literature, rival conceptions of virtue and moral education. *Journal of Aesthetic Education*, *51* (2), 1-16. https://doi.org/10.5406/jaesteduc.51.2.0001

Carr, D. (2023a). The hazards of role-modelling for the education of moral and/or virtuous character. *Philosophical Inquiry in Education*, *30* (1), 68-79. https://journals.sfu.ca/pie/index.php/pie/article/view/1529

Carr, D. (2023b). Love, knowledge and freedom in *Pleasantville*, religious scripture and wider western literature. *Religion and the Arts*, *27* (3), 345-366. https://doi.org/10.1163/15685292-02703002

Carroll, N. (1986). Art and interaction. *Journal of Aesthetics and Art Criticism*, *45* (1), 57-68. https://doi.org/10.2307/430466

Carroll, N. (1996). Moderate moralism. *British Journal of Aesthetics*, *36* (3), 223-37. https://doi.org/10.1093/bjaesthetics/36.3.223

Carroll, N. (1998). Moderate moralism versus moderate autonomism. *British Journal of Aesthetics*, *38* (4), 419-24. https://doi.org/10.1093/bjaesthetics/38.4.419

Durkheim, E. (1973). *Moral education*. Free Press of Glencoe.

Frye, N. (1974). *The stubborn structure: Essays on criticism and society*. Methuen.

Gaut, B. (1998). The ethical criticism of art. In J. Levison (Ed.), *Aesthetics and ethics: Essays on the intersection* (pp. 182-203). Cambridge University Press.

Geach, P. T. (1977). *The virtues*. Cambridge University Press.

Hepburn, R. (1984). Contemporary aesthetics and the neglect of natural beauty. In *Wonder and other essays: Eight studies in aesthetics and neighbouring fields*. Edinburgh University Press.

Kohlberg, L. (1984). *Essays on moral development: Volume 1*. Harper Row.

Lamarque, P. (1996). *Fictional points of view*. Clarendon Press.

Lamarque, P., & Olsen, S. H. (1990). *Truth, fiction and literature: A philosophical perspective*. Clarendon Press.

Lickona, T. (2004). *Character matters*. Touchstone.

McFee, G. (2005). The artistic and the aesthetic. *British Journal of Aesthetics*, *45* (4), 368-387. https://doi.org/10.1093/aesthj/ayi049

MacIntyre, A. C. (1981). *After virtue*. Notre Dame Press.
Meyer, M. (Ed.). (1998). The secret book of John. In *The secret gospels of Jesus* (pp. 129-183). Harper San Francisco.
Milton, J. (2005). *Paradise lost* Arcturus Publications.
Murdoch, I. (1970). *The sovereignty of the good*. Routledge and Kegan Paul.
Murdoch, I. (1993). *Metaphysics as a guide to morals*. Penguin Books.
Murdoch, I. (1997). The sublime and the beautiful revisited. In I. Murdoch (Ed.), *Existentialists and mystics: Writings on philosophy and literature* (pp. 261-286). Chatto and Windus.
Nietzsche, F. (2012). *Daybreak: Thoughts on the prejudices of morality* (M. Clark & B. Leiter, Eds.). Cambridge University Press.
Piaget, J. (1932). *The moral judgement of the child*. Free Press.
Ryan, K., & Bohlin, K. E. (2003). *Building character in schools: Practical ways to bring moral instruction to life*. Jossey Bass.
Stecker, R. (2005). The interaction of ethical and aesthetic value. *British Journal of Aesthetics*, *45* (2), 138-150. https://doi.org/10.1093/aesthj/ayi016
Swanton. C. (2003). *Virtue ethics: A pluralistic view*. Oxford University Press.
Szutta, N. (2019). Exemplarist moral theory - some pros and cons. *Journal of Moral Education*, *48* (3), 280-290. https://doi.org/10.1080/03057240.2019.1589435
Zabzebski, L. (2010). Exemplarist virtue theory. *Metaphilosophy, 41* (1-2), 41-57.
Zabzebski, L. (2013). Moral exemplars in theory and practice. *Theory and Research in Education*, *11* (2), 192-306. https://doi.org/10.1177/1477878513485177

Author's biography

David Carr. Emeritus Professor of the University of Edinburgh and was until recently Professor of Ethics and Education at the University of Birmingham (UK) Jubilee Centre for the Study of Character and Virtues. He is author of four books, editor or co-editor of several major collections of essays on philosophy and/or education and his papers have appeared in such journals as *Mind*, *Philosophy*, *Philosophical Quarterly*, *Proceedings of the Aristotelian Society*, *Philosophical Studies*, *Journal of Value Inquiry*, *British Journal of Aesthetics*, *Educational Theory* and *Oxford Educational Review*. Much of his work has explored aspects of virtue ethics and, more recently, the impact of literature and various other arts on moral character.

New focuses in research in music education

Introduction: New focuses in research in music education

Research on music education is an area of study that started its journey in the early twentieth century in the USA, around the National Association for Music Education. The first meetings of music education teachers and researchers were organised through annual conferences, at which the initial focus was on essentially musical content, such as new ways of teaching and learning rhythmic aspects (Molnar, 1955). These early stages were also marked by the need for in-depth consideration of training of music teachers in primary and secondary education, conservatories and music schools. This opened a path to study areas of learning that could favour musical appreciation and sensitivity. The aim was to actively participate in the development of psychomotor process (acquiring skills), cognitive process (acquiring knowledge), and, in particular, affective process (receiving, internalising, and sharing what is learnt), which is undoubtedly one of the dimensions that to which music contributes most (Cox & Steven, 2016).

Building on these initial studies, the path of research in music education has seen significant growth thanks to the interchange of collaborative experiences between different areas and disciplines, which have worked jointly on music research through studies of proven methodological quality, in line with other areas based on the clearest academic tradition. This inter-, multi- and trans-disciplinary approach has made a very important contribution, as shown in the emerging lines of research that link music education with educational sciences, pedagogy, technology, psychology, sociology, emotional education, and neuroscience, among others (Barret, 2023).

What is more, this path of research in music education has been favoured not only by the diffusion of articles in specialist journals, but also by the contribution in thematic monographic issues of education journals that aim to showcase the research carried out in the different areas of the field of education. I would therefore like to thank the **Revista Española de Pedagogía** for enabling this monographic issue to take shape with the publication of five articles that make important contributions to bringing the scientific corpus up to date in different lines of research in music education; we hope they will help readers enrich their outlook on music education.

The article "Bibliometric study of the scientific production on music education in Spain (1978–2022)", by the researchers Gregorio Vicente-Nicolás and Judith Sánchez-Marroquí reinforces one of the ideas with which this monographic issue originated, as focusses on analysing Spanish academic production in music education in recent decades, establishing a ranking of most-cited articles and most productive authors, and determining which thematic lines are most frequent. It is a very interesting and necessary study, which, as an innovation among review studies, analyses the bibliometric laws proposed by Ardanuy (2012), which serve to address directly the proposed objectives. Among its findings, an increase in Spanish academic output since 2014 is apparent. Among its conclusions, it is worth noting that the most common trends in music education are grouped around methodology, teacher training, technology, creativity, innovation, performance, emotions, music therapy, interculturality, or inclusive education. Besides, Spain is one of the most productive countries in music education, technology, and creativity.

For its part, the article "Instrumental practice to shape character: educational possibilities from a perspective of musical craftsmanship", by David González-Llopis, shows the parallels existing between instrumental practice in the conservatory and the concept of *character education* based on two classic works by Aristotle, *Politics* and the *Nicomachean Ethics*. This concept, along with the perspective of craftsmanship, underline the importance of instrumental proficiency as the cornerstone of the teaching–learning process. This reflection highlights the criticism of current formative practice in professional instrumental training contexts, concluding that it is necessary to adapt the educational framework and consider not only technical questions, but also the needs of people in their development.

In the article "Music education's contribution to the development of emotional intelligence in adolescents and its effect on the gender variable", the authors, Ana-María Botella-Nicolás and Inmaculada Retamero-García, offer an interesting work centred on displaying the contributions of music education to the development of emotional intelligence in a developmental stage as complex as adolescence. This study includes psychological, sociological, and musical aspects to respond to the demands of the educational setting associated with the deficiencies in emotional intelligence observed in young people. It is in this stage that music can play an important role as it is a medium for expressing emotions that contributes to their development by improving the individual's sensitivity and emotional control. The main findings of this study are that there are differences in emotional intelligence by age and gender of participants, and that, in the case of musicians, these levels are significantly higher. Therefore, the authors conclude that music strengthens the development of emotional competences and produces benefits applicable to the educational context.

The next article, "The music that new generations listen to: preferences and stereotypes", by Roberto Cremades-Andreu, Carlos Lage-Gómez and Arantza-Campollo Urkiza, features the invaluable participation of one of the most important researchers of the social psychology of music in the international panorama, Professor David J. Hargreaves. This work emphasises the social function that young people attribute to music and how they relate to one another through it given its profound implications in the creation of individual identity. The results show that the styles of popular urban music are the ones preferred by young people, with older respondents listening to a wider range of styles than the younger ones, and female respondents favouring mainstream musical trends and Latin music. Generation, personality, and behaviour are the stereotypes they most associate with their preferences. These findings underline that, despite being a recurring subject of research over recent decades, the meaning that young people give music is still an important aspect to consider in their education, with continued work to strengthen their listening ability and critical capacity in music classes being necessary.

Lastly, the article "Colombia Creativa Artists' Professionalisation Programme (PPACC - Programa de Profesionalización de Artistas Colombia Creativa): Evaluation of the organisation and musical training accomplished", by Oswaldo Lorenzo-Quiles, Ana Lendínez-Turón, and Yuly Rodríguez-Ramírez focuses on displaying the functioning and achievements in music training of the Colombia Creative Professionalisation Programme for Artists (PPACC), an initiative funded by Colombia's Ministry of Culture with the aim of providing music training to professional musicians who did not have the opportunity to certify officially their level of achievement of musical competences in an academic institution. The most important results of this research reveal the difficulties in attending the educational centres where the programme is delivered owing to financial or employment differences among participants, as well as insufficient training for the staff entrusted with teaching the programme to cater for professionals with different levels of musical competence. Therefore, while this initiative is coherent and satisfactory, it should be open to reflection and dialogue to improve and adapt to the different levels of the music teaching-learning process of these professionals.

Each of the articles included in this monographic issue helps bring knowledge in music education research up to date. They also raise new questions and research perspectives to continue delving into the thematic lines that have been presented: the valuation of non-formal music training programmes, the importance of character education in professional instrumental training, musical identity and the meaning of music for current generations, the

contributions of music education to the development of emotional intelligence, and providing a snapshot of Spain's scientific production on music education.

To finish, it is important to thank the authors of such well-written works, as well as the often unrecognised work of the anonymous reviewers who, with their comments, have contributed to improving the articles that comprise this monographic issue.

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References

Ardanuy, J. (2012). *Breve introducción a la bibliometría [A brief introduction to bibliometrics]*. Universitat de Barcelona.

Barrett, J. R. (2023). *Seeking connections: An interdisciplinary perspective on music teaching and learning*. Oxford University Press.

Cox, G., & Stevens, R. (Eds.). (2016). *The origins and foundations of music education: International perspectives*. Bloomsbury Publishing.

Molnar, J. V. (1955). The establishment of the Music Supervisors National Conference, 1907-1910. *Journal of Research in Music Education*, *3* (1), 40-50. https://doi.org/10.2307/3344410

The music that new generations listen to: preferences and stereotypes

La música que escuchan las nuevas generaciones: preferencias y estereotipos

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Abstract:

For young people, music is not just meaningful as an object of aesthetic consumption; it also has a social function to which they attribute different values that influence their identity and social relations. Thus, the aim of this article is to evaluate how their musical preferences are structured and what differences exist by gender and age range, as well as studying what stereotypes they associate with the styles they listen to most in comparison with these variables. To do so, an updated and adapted version of the questionnaire by Cremades et al. (2010) was used. This was answered by 1020 adolescents from a district of the city of Madrid: 540 female (52.9%) and 480 male (47.1%) aged between 12 and 20. The results reveal which styles of popular urban music young people prefer, with older ones listening to a wider range of styles than the younger ones, and female respondents favouring mainstream music and Latin music. The stereotypes they most associate with their preferences are "generation", "personality", and "behaviour", something that is related to the development of the adolescent's own identity. Therefore, starting from knowledge of the meaning young people attribute to music, it is necessary for music lessons to improve their listening and critical capacities, as a way of creating competent listeners, with sufficient musical and social knowledge of the music they prefer.

Keywords: musical preferences, sociocultural stereotypes, adolescence, new generations.

Resumen:

Para los jóvenes, la música no solo es un objeto de consumo estético; también cumple una función social, a la que atribuyen diversos valores que influencian su identidad y sus relaciones sociales. Así, el objetivo de este artículo es evaluar cómo se estructuran sus preferencias musicales y qué diferencias existen en función del género y del rango de edad, además de estudiar qué estereotipos asocian a los estilos que más escuchan según dichas variables. Para ello, se utilizó un cuestionario actualizado y adaptado de Cremades *et al.* (2010), al que respondieron 1020 jóvenes adolescentes de un distrito de la ciudad de Madrid: 540 mujeres (52.9 %) y 480 hombres (47.1 %) de entre 12 y 20 años. Los resultados ponen de manifiesto qué estilos de música popular urbana prefieren los jóvenes. Asimismo, que los de mayor edad escuchan un rango más amplio de estilos y que las mujeres se decantan por las tendencias musicales y la música latina. Respecto a los estereotipos, «generación», «personalidad» y «comportamiento» son los que más asocian a sus preferencias, lo cual se relaciona con el desarrollo de la propia identidad del adolescente. Como conclusión, creemos que, a partir del conocimiento sobre el significado que le dan los jóvenes a la música, es preciso potenciar su escucha y capacidad crítica desde el aula de música, como una forma de construir oyentes competentes, con conocimientos musicales y sociales suficientes de la música que prefieren.

Palabras clave: preferencias musicales, estereotipos socioculturales, adolescencia, nuevas generaciones.

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1. Introduction

Music can be considered as one of the main reference points for young people in cognitive terms (comprehension of musical elements and their structure), emotional terms (the feelings it conveys), and social terms (social acceptance of individual musical taste), as every day they are exposed to sound stimuli that influence their intellectual, social, and personal development (Hallam, 2010). Different authors (Hargreaves et al., 2012; Evans & McPherson, 2017; Symonds et al., 2017) have studied the effects that the approach to certain musical styles has on the individual, how they relate through them, and what value they place on the musical experience.

Hargreaves et al. (2006) proposed a reciprocal feedback model that explained how the individual processes and relates to music. This model considers not only the musical elements and the choice that the listener makes of what to listen to but also the setting in which it occurs (what the authors call the *listening situation*), as, in it, the listener can express and share his or her musical preferences with other people. In the same vein, Megías and Rodríguez (2003) had already pointed out that listening to any type of music is a personal and voluntary act in which, beyond the perception of musical elements (such as rhythm, melody, or lyrics), the listener associates listening with different aspects that are personal (memories, feelings, or emotions), but which, at the same time, unite them and they like to share. These ideas point towards the close relationship created between the person, the music, and the social context. That is, young people identify with music for what it contributes to their lives, giving a meaning more related to its social function (Bonneville-Roussy & Rust, 2018; Hargreaves et al., 2015; MacDonald et al., 2017; Morrison, 2017).

This social function becomes more relevant in adolescence, a period of change when individuals find themselves searching for self-affirmation of their personality and identity (McLean & Thorne, 2003). On this changing path, peers constitute the reference group that influences an individual's development, given that a vision of one's own identity can be projected through the group (Knifsend & Juvonen, 2014). With the peer group, they share musical preferences, as well as particular values, cultural patterns, habits, lifestyles, fashions, or stereotypes, among others (DeWall et al., 2011; Lonsdale & North, 2017; Marín-Liébana et al., 2021; Reeves et al., 2015).

DeNora (2017) states that identity formation could be regarded as a dynamic construct in constant change. Such construct creates new spaces for social grouping through different external agents, among which the internet is the medium most followed by young people (Pedrero-Esteban et al., 2019). In fact, the media influence of platforms, social networks, and apps such as Spotify has increased their dominance in shaping the musical preferences of present generations, something that has involved a reduction in their range of listening (Werner, 2020). On the opposing side, the styles of music they hear in music lessons are the ones they rate lowest. These lessons often still encourage listening to musical styles that differ greatly not only from current sounds, but also from the social meanings music has for new generations. Therefore, music teachers should focus their content on fostering critical thinking about the music that young people prefer in order to favour the development of their musical identity by expanding the range of musical styles they listen to (Thomas, 2016).

2. About musical preferences

Research into musical preferences is a line that has been brought up to date with new studies in different national and international contexts. In a study carried out with a sample of British adolescents (n = 278), Hargreaves et al. (1995) used a list of twelve musical styles that were analysed according to *age* and *gender* variables. The styles included were rap, house, reggae, blues, heavy metal, jazz, classical, country, pop, folk, opera, and rock. In their conclusions, they note that age significantly shapes the approach to styles of music known as *popular* at the expense of *serious* music. In addition, women preferred a wide variety of styles and were closer to *serious* music than men, who were more focussed on *popular* music.

Rentfrow and Gosling (2003), in the United States, designed a short test of musical preferences (STOMP) comprising a list of fourteen musical styles, which was answered on a seven-point Likert scale (1 = Not at all, 7 = A great deal). The exploratory factor analysis grouped these styles into four dimensions: (1) reflective-complex (blues, jazz, classical, and folk), (2) intense-rebellious (rock, alternative, and heavy metal), (3) upbeat-conventional (country, soundtracks, religious, and pop), and (4) energetic-rhythmic (rap/hip-hop, soul/funk, electronic/dance). To design the questionnaire, they drew up an initial list of eighty styles and sub-styles with the help of a panel of five experts. They then performed a pilot

study with thirty participants. Of these, only 7% knew all of the sub-styles included in the study, while 97% knew all of the styles, and so it was decided that the test would solely comprise the most listened-to styles.

Following this model, Colley (2008), with a sample of young British people, centred her analysis on identifying these dimensions, but went a step further and grouped them by gender. Accordingly, she obtained four dimensions for women: sophisticated (comprising classical, blues, jazz, opera), heavy (rock, heavy metal), rebellious (rap, reggae), and mainstream (chart pop, folk, country); and four for males: sophisticated (classical, blues, jazz, opera), traditional (folk, country), heavy (heavy metal, rock), and rebellious (reggae, rap).

Later on, Rentfrow et al. (2011) identified five dimensions: (1) mellow (pop and R&B), (2) unpretentious (country and rock and roll), (3) sophisticated (classical and jazz), (4) intense (heavy metal and punk), and (5) contemporary (rap and electronic). Lorenzo-Quiles et al. (2021) used this classification, which they adapted by including Brazilian styles in a sample of 940 young Brazilians aged between 14 and 20.

In Spain, one of the first studies on musical tastes centred on adolescents and young people was the one by Megías and Rodríguez (2003). The sample included 1900 participants from around the country aged between 15 and 24. The questionnaire had various sections, one of which contained a list of the following musical styles: pop, dance, Latin, singer-songwriters, electronic music, balladeers, rumba, flamenco, rock and roll, hip-hop/rap, alternative rock, grunge, indie-rock, indie-pop, alternative pop, traditional or regional music, reggae, ska, ethnic, heavy metal, classical, progressive rock, punk, new age, jazz, and folk. The last eight styles were the ones of which young people were least aware. According to the authors, the principal listening styles brought together styles close to pop, which are the ones that took the top places in sales lists and chart hits. On the next step were those that were listened to in nightclubs, while the styles that young people listened to least were the ones adult generations preferred. The questionnaire also included a section on stereotypes associated with music, from which the authors concluded that the group of young people used them as a way of forming groups and, at the same, distinguishing between peers.

This review underlines the difficulty of examining musical styles as a single unit of analysis in order to classify them, and also considers the current difficulty of categorising songs into a specific genre. Following this argument, Pedrero-Esteban et al. (2019) focused on the problem of categorising popular urban music owing to its current distinctive features. It is a composite audio experience using advanced technologies capable of shaping all of the musical parameters of a recording (tone/voice, pitch/intonation, rhythm/speed) and that is spread through listening platforms, social networks, etc. This has involved a process of homogenisation that hinders a clear distinction between the different styles and sub-styles of this type of music.

3. Stereotypes in music

According to Kurtz-Costes et al. (2014), stereotypes are defined as knowledge shared among particular social groups that might or might not reflect certain characteristics of this group with regards to nationality, race, social class, sex, age, and occupation, among other aspects. It is a way of labelling people according to determined values that categorise them ambiguously and, on many occasions, do not represent them.

In their relationship with music, stereotypes can become visible in external aspects that do not focus on musical characteristics, such as rhythm, melody, harmony, or tone (Susino & Schubert, 2019). Furthermore, it is important to note that, for young people, the agent with the biggest influence on how they listen to music is in the online setting. Through platforms, social networks, and user profiles, they are constantly exposed to stereotyped visions of their body image, how they dress, their gender, their personality, and their age, among others (Oberst et al., 2016). Far from contributing to an equal perspective, the basic aim of companies that operate on the internet is the commercialisation of cultural products to increase consumption and sales of their services. To do so, they study the recommendations of users, an *algorithmic culture* in which we are all trapped (Striphas, 2015). With regards to music, the main point of reference for listening via streaming among the youngest users is Spotify, an app that organise music in closed categories according to style, sex, race, social class, and nationality. Musical lists are not structured at random nor are they shaped exclusively by listeners' choices. Instead, they are manipulated by algorithms to make profits, without considering that they reinforce specific listening patterns that are embedded in or associated with particular stereotypes (Werner, 2020).

Regarding stereotypes relating to image and behaviour, Rentfrow and Gosling (2007) studied the

perceptions of fans of different musical styles. The people closest to classical music were perceived as friendly, industrious, introverted, intelligent, but physically unattractive. In contrast, fans of rap were perceived as extroverted and athletic, as well as being more likely to use drugs, a characteristic still associated with them today.

Reeves et al. (2015) studied stereotypes of social class associated with music. They concluded that people's socio-economic level determines their listening preference for more or less intellectual musical styles, creating a social hierarchy that highlights these stereotypes.

Moreover, it is also necessary to mention studies that have focussed on assessing the influence of music on personality development (Herrera et al., 2018). Račevska and Tadinac (2019) found positive correlations in the preference for reflective, complex, and intense musical styles, confirming that their influence is also apparent in our emotions and is associated with particular personality traits.

Nonetheless, the stereotypes that have been studied most in their association with musical preferences are those relating to gender (Dobrota et al., 2019; Rentfrow et al., 2011; Roulston & Misawa, 2011). For example, an affinity for musical styles such as rock has been associated with a form of cultural expression typical of masculine identity, while pop has been considered closer to feminine ideals (Lorenzo-Quiles et al., 2021). In this sense, Soares-Quadros et al. (2019) explained that women identify with styles that have emotional content, such as dance, or pop, while men prefer more vigorous, complex, and exciting styles, such as heavy metal; similar results to those obtained by Dobrota and Ercegovac (2015).

On the other hand, it is important to note that, beyond the musical taste reported by men or women, the sexualisation found in music videos from mainstream music continues to offer a vision that clearly objectifies women. Even in videos by female artists, their nakedness often contrasts with the dominant position of the man and these images can be very harmful for minors (Gutiérrez & Ubani, 2023). On the same line, Werner (2023) notes a majority presence of black, brown, and Latino masculinities performing styles such as rap, trap, and reggaeton in the charts of European countries. She also analyses the female image in different music videos by male and female artists. They contain a positive image of women, extolling their friendship, personal and financial independence, professional skill, strengths, and understanding. However, at the same time, with commercial aims, they show them in revealing clothes, in stylish outfits, wearing expensive accessories, beautiful, desirable, and twerking, something that continues to transmit a sexualised image of women.

Following the review of literature relating to this work, its main aim is to establish a grouping based on the preference for musical styles that a cohort of young people from Madrid listen to the most. As secondary objectives, it seeks to study the differences between these dimensions by *age* and *gender* variables, and to evaluate the relationship between these musical styles and the sociocultural stereotypes that young people associate with them.

4. Method

This article uses an *ex post facto* study following the designs found in the research works included in the literature review.

4.1. Participants

The participants in this research were secondary-school students from a district located to the south-east of the city of Madrid ,where there are six publicly run schools and seven state-funded private and private ones. The sample comprised 1020 participants, 540 female (52.9%) and 480 male (47.1%), with ages ranging from 12 to 20 and a mean age of 15.18 years (SD = 2.12). Owing to the spread of their ages, we decided to group them by cumulative percentage into four age ranges, that is: 12 to 13 years (n = 237, 23.3%), 14 to 15 (n = 332, 32.5%), 16 to 17 (n = 301, 29.5%) and 18 to 20 (n = 149, 14.6%). The groups of students in the sample were selected at random, choosing one class from each year in the secondary schools with the aim of them being representative of the group in question.

4.2. Instrument

Taking into account the different questionnaires available to obtain information about musical preferences (Hargreaves et al., 1995; Rentfrow, et al., 2011), we used the "Music styles listening preference questionnaire" (Cremades et al., 2010), which we adapted to the characteristics of this study. To do so, the list of musical styles was updated and, at the same time, a section on sociocultural stereotypes was added. This list took shape around the styles to which the participants feel closest, with the aim of not dispersing the results in music listened to only by a small minority or by

nobody. The items on this instrument were answered using a five-point Likert scale (1 = Never, 5 = Always). The final questionnaire has a Cronbach's alpha reliability coefficient of .787. For content validity, we used the expert judgement technique, a process involving the participation of ten specialists and researchers in music education with extensive experience in this field, who reported on the pertinence and relevance of the prepared questionnaire.

4.3. Process

Before carrying out the data collection for this study, we requested the agreement of the management teams of the participating centres and sought informed consent from the students and their families, who we notified of aspects such as the fact that they could abandon the study at any moment and that their anonymity would be preserved. The questionnaire was administered by the researchers in person so that its completion could be supervised. The students completed the questionnaire in a session that lasted approximately twenty minutes.

5. Results

The analyses centred on the musical styles with the highest mean scores in order not to disperse the results. Following the procedure of the studies cited in the theoretical review, we used an exploratory factor analysis so that, on the basis of the dimensions obtained, we could analyse the differences by the age range and gender of the participants using parametric tests. Finally, we applied a Pearson's correlation analysis to establish which stereotypes the participants in this study associate with the styles they listen to most.

5.1. Dimensions of musical preferences and their differences by age range and gender

Table 1 shows the descriptive statistics for the styles listened to most by the participants in this study.

TABLE 1. Descriptive statistics for the styles listened to most by participants.

Musical styles	*n*	Minimum	Maximum	$\bar{X}$	σ
Pop	1020	1	5	3.66	1.282
Rap/Hip-hop	1020	1	5	3.35	1.220
Reggaeton	1020	1	5	3.28	1.500
Trap	1020	1	5	3.11	1.561
Electronic music	1020	1	5	2.82	1.359
Rock and roll	1020	1	5	2.56	1.314
Techno	1020	1	5	2.35	1.279
Phonk	1020	1	5	2.29	1.244
Bachata	1020	1	5	2.26	1.325
Dance	1020	1	5	2.25	1.302
Flamenco	1020	1	5	2.13	1.352
Dembow	1020	1	5	2.12	1.214

Note: 1 = Never, 5 = Always.

As Table 1 shows, the styles with the highest scores were pop, rap, reggaeton, and trap, with the lowest figures being for dance, flamenco, and dembow. Taking these styles, we used the Bartlett test and the KMO (Kaiser-Meyer-Olkin) measure, which gave a value of .71 (Bartlett's test of sphericity $\chi^2 = 2965.32$, $p < .000$). This result was higher than the reference value of .6, thus indicating that this type of analysis is valid. So, we carried out a factor analysis using the principal components extraction method with Oblimin rotation, giving five factors that explained 69.57% of the total variance (see Table 2).

TABLE 2. Structure of musical preferences.

Dimensions	Musical styles	Components				
		1	2	3	4	5
Urban music	Rap/Hip-hop	.876				
	Phonk	.652				
	Trap	.464				
Latin music	Dembow		.826			
	Bachata		.647			
	Reggaeton		.639			
Mainstream music	Pop			.777		
	Dance			.703		
Musical fusion	Flamenco				.829	
	Rock and roll				.808	
Technological music	Techno					.913
	Electronic music					.876

As Table 2 shows, each dimension comprises related musical styles and is named after the specific characteristics they share: (1) urban music: this includes rap/hip-hop and the sub-styles phonk and trap; (2) Latin music: this includes sub-styles of Latin origin such as dembow, bachata, and reggaeton; (3) mainstream music: including pop and dance, reference points in the charts; (4) musical fusion: combining flamenco and rock and roll, which share processes of evolution with the fusion of diverse styles; and (5) technological music: which includes techno and electronic music.

We then performed an analysis of variance of the musical dimensions obtained according to the *age range* variable (see Table 3).

TABLE 3. ANOVA of musical dimensions by age range.

Dimensions	Age range	*n*	$\bar{X}$	σ	*F*	*p*	η_p^2	*Post hoc*
Urban music	12 a 13 (1)	238	2.70	1.01	6.906	.001*	0.020	4, 3, 2 > 1
	14 a 15 (2)	332	2.93	.95				
	16 a 17 (3)	301	3.00	.93				
	18 a 20 (4)	149	3.11	1.01				
Latin music	12 a 13	238	2.43	.96	2.171	.90		
	14 a 15	332	2.54	1.4				
	16 a 17	301	2.66	1.00				
	18 a 20	149	2.58	1.09				
Mainstream music	12 a 13	238	2.76	1.07	3.701	.011*	0.011	3 > 1
	14 a 15	332	2.98	1.08				
	16 a 17	301	3.04	1.03				
	18 a 20	149	3.02	.94				

Musical fusion	12 a 13	238	1.87	.85	25.005	.001*	0.069	4, 3 > 1, 2
	14 a 15	332	1.97	.93				
	16 a 17	301	2.29	1.09				
	18 a 20	149	2.68	1.17				
Technological music	12 a 13	238	2.12	1.12	23.756	.000*	0.066	4, 3, 2 > 1 4 > 3, 2, 1
	14 a 15	332	2.55	1.18				
	16 a 17	301	2.76	1.13				
	18 a 20	149	3.05	1.23				

*$p \leq .05$.

The results show statistically significant differences in "urban music", with a small effect ($\eta_p^2 \approx 0.01$); here the oldest students report listening to this type of music more than the students aged from 12 to 13 do. The same effect size was found for "mainstream music", with young people aged from 16 to 17 having higher averages than those aged 12 to 13. In the case of "musical fusion", the effect was higher ($\eta_p^2 \approx 0.06$), with subjects aged 18 to 20 and 16 to 17 having upper means than those from lower ranges. The same thing happened with "technological music": the older respondents score higher than the younger ones, and those aged 18 to 20 score highest of all.

Next, we analysed gender differences in musical dimensions using Student's *t* test (see Table 4).

TABLE 4. Student's *t* test for musical dimensions by gender.

Dimensions	**Gender**	***n***	$\bar{X}$	σ	**Levene's**	***t test***	***d***
Urban music	Female	540	2.90	.97	$F = .028$ $p = .868$	$t = .844$ $p = .399$	
	Male	480	2.95	.98			
Latin music	Female	540	2.77	1.06	$F = 16.733$ $p = .001$	$t = 7.407$ $p = .001$*	.46
	Male	480	2.31	.92			
Mainstream music	Female	540	3.24	1.01	$F = .110$ $p = .741$	$t = 9.562$ $p = .001$*	.60
	Male	480	2.63	.96			
Musical fusion	Female	540	2.07	1.04	$F = .405$ $p = .525$	$t = 2.199$ $p = .028$*	.14
	Male	480	2.22	1.05			
Technological music	Female	540	2.40	1.14	$F = .250$ $p = .617$	$t = 5.207$ $p = .001$*	.33
	Male	480	2.79	1.19			

*$p \leq .05$.

The results of the previous analysis were statistically significant for the last four dimensions. Women scored higher than men with regards to "Latin music" (with a small effect from 0.21 to 0.49) and "mainstream music" (with a moderate effect from 0.50 to 0.70). In contrast, men gave "musical fusion" and "technological music" higher scores than women did, with a small effect.

5.2. Stereotypes associated with preference for musical styles

This section starts with an analysis of the descriptive statistics of the stereotypes associated with students' musical preferences.

In this table, higher scores indicate that students associate their musical preferences with the stereotypes that relate to their personality, generation, and behaviour. In contrast, stereotypes relating to gender had the lowest mean score.

To continue, we performed an analysis of variance of the stereotypes that participants associate with the dimensions by age range (see Table 6).

TABLE 5. Descriptive statistics for stereotypes associated with musical preferences.

Stereotypes	*n*	Minimum	Maximum	$\bar{X}$	σ
Way of dressing	1020	1	5	2.36	1.229
Behaviour	1020	1	5	2.65	1.249
Personality	1020	1	5	3.19	1.332
Generation	1019	1	5	3.09	1.434
Gender	1020	1	5	1.65	1.110
Physical appearance	1020	1	5	1.71	1.124
Values	1020	1	5	2.46	1.413
Relation with others	1020	1	5	2.43	1.337

Note: 1 = Never, 5 = Always.

TABLE 6. ANOVA of stereotypes by age range.

Stereotypes	Age range	*n*	$\bar{X}$	σ	*F*	*p*	η_p^2	*Post hoc*
Way of dressing	12 to 13 (1)	237	2.08	1.22	10.506	.001*	.030	4, 3 > 1
	14 to 15 (2)	332	2.34	1.17				
	16 to 17 (3)	301	2.39	1.26				
	18 to 20 (4)	149	2.79	1.21				
Behaviour	12 to 13	238	2.37	1.23	7.811	.001*	.023	4, 3, 2 > 1
	14 to 15	332	2.68	1.22				
	16 to 17	301	2.69	1.26				
	18 to 20	149	2.98	1.24				
Personality	12 to 13	238	2.84	1.45	8.791	.001*	.025	4, 3, 2 > 1
	14 to 15	332	3.17	1.31				
	16 to 17	301	3.35	1.24				
	18 to 20	149	3.43	1.27				
Generation	12 to 13	238	2.76	1.55	5.757	.001*	.017	4, 3, 2 > 1
	14 to 15	332	3.14	1.46				
	16 to 17	301	3.23	1.31				
	18 to 20	149	3.21	1.37				
Gender	12 to 13	238	1.65	1.12	.179	.610		
	14 to 15	332	1.68	1.14				
	16 to 17	301	1.65	1.06				
	18 to 20	149	1.60	1.14				

Physical appearance	12 to 13	238	1.64	1.13	2.058	.104		
	14 to 15	332	1.75	1.36				
	16 to 17	301	1.63	1.02				
	18 to 20	149	1.88	1.28				
Values	12 to 13	238	2.08	1.30	12.892	.001*	.037	4, 3, 2 > 1 4 > 3, 2
	14 to 15	332	2.43	1.37				
	16 to 17	301	2.56	1.39				
	18 to 20	149	2.96	1.57				
Relation with others	12 to 13	238	2.12	1.32	7.959	.001*	.023	4, 3, 2 > 1 4 > 2
	14 to 15	332	2.42	1.31				
	16 to 17	301	2.50	1.28				
	18 to 20	149	2.77	1.34				

*$p \leq .05$.

The results were significant for all of the stereotypes, except for the ones relating to "gender" and "physical appearance". Specifically, in the ones regarding "behaviour", "personality" and "generation", all of the age ranges older than 12 to 13 years have higher means, with a small effect size. With the same effect, students aged from 18 to 20 and from 16 to 17 scored higher than those aged 12 to 13 in "way of dressing". With regards to "values", respondents aged from 12 to 13 have the lowest means, while those aged from 18 to 20 score highest of all with a small effect. In the case of "relation with others", respondents aged from 12 to 13 scored lowest, with there also being larger differences for the 18 to 20 range compared to those aged from 14 to 15.

As in the previous section, we carried out an analysis using Student's *t* test to analyse gender stereotypes.

TABLE 7. Student's *t* test for gender stereotypes.

Stereotypes	**Gender**	***n***	***X***	***σ***	**Levene's**	***t* test**	***d***
Way of dressing	Female	540	2.35	1.21	$F = .657$ $p = .418$	$t = .216$ $p = .829$	
	Male	480	2.37	1.25			
Behaviour	Female	540	2.65	1.25	$F = .118$ $p = .732$	$t = .030$ $p = .976$	
	Male	480	2.65	1.24			
Personality	Female	540	3.31	1.33	$F = 2.034$ $p = .154$	$t = -3.214$ $p = .001$*	.20
	Male	480	3.04	1.32			
Generation	Female	540	3.25	1.41	$F = .009$ $p = .925$	$t = -3.714$ $p = .001$*	.23
	Male	480	2.91	1.45			
Gender	Female	540	1.59	1.06	$F = 7.950$ $p = .005$	$t = 1.901$ $p = .058$	
	Male	480	1.72	1.61			
Physical appearance	Female	540	1.67	1.07	$F = 4.675$ $p = .031$	$t = 1.159$ $p = .247$	
	Male	480	1.75	1.19			
Values	Female	540	2.42	1.38	$F = 3.421$ $p = .065$	$t = 1.016$ $p = .310$	
	Male	480	2.51	1.45			
Relation with others	Female	540	2.40	1.31	$F = 2.207$ $p = .138$	$t = .717$ $p = .473$	
	Male	480	2.46	1.37			

*$p \leq .05$.

The previous analysis found significant differences for personality and generation, with a small effect size; specifically, female respondents scored higher than male ones.

Finally, we performed a Pearson's correlation coefficient analysis between the musical styles from Table 1 and the sociocultural stereotypes included in this study, the results of which are shown in Table 8.

TABLE 8. Pearson's correlation analysis of preferred styles and stereotypes.

Musical styles		Stereotypes							
		WD	**B**	**P**	**GZ**	**G**	**PA**	**V**	**R**
Pop	*r*	-.037	.088*	.155*	.197*	.086*	-.008	.102*	.098*
Rap/Hip-hop	*r*	.244*	.172*	.130*	.112*	.023	.130*	.119*	.136*
Reggaeton	*r*	-.049	-.115*	-.127*	.339*	.092*	.082*	-.197*	-.021
Trap	*r*	.116*	-.019	-.058	.306*	-.029	.092*	-.158*	.005
Electronic music	*r*	.121*	.211*	.174*	.101*	.049	.137*	.137*	.122*
Rock and roll	*r*	.135*	.179*	.199*	-.133*	-.029	.030	.294*	.107*
Techno	*r*	.107*	.162*	.160*	.132*	.072*	.164*	.155*	.109*
Phonk	*r*	.210*	.175**	.171*	.072*	.067*	.118*	.145*	.131*
Bachata	*r*	.047	.034	.044	.245*	.098*	.099*	-.026	.068*
Dance	*r*	.140*	.136*	.175*	.147*	.015	.067*	.114*	.092*
Flamenco	*r*	.249*	.184*	.171*	-.090*	-.015	.091*	.272*	.153*
Dembow	*r*	.035	-.017	-.034	.120*	.045	.076*	-.010	-.009

*p <.05
Note: WD = way of dressing, B = behaviour, P = personality, GZ = generation, G = gender, PA = physical appearance, V = values, R = relation with others.

The results in Table 8 were statistically significant for most of the variables analysed, although, using the values of Cohen, the effect size was not large ($r \geq .50$). We should note the moderate size ($.30 \leq r < .50$) for reggaeton and trap with the "generation stereotype", which, also with a small size, was obtained for bachata and pop. With a small effect, it is also necessary to mention rap, phonk, and flamenco with "way of dressing"; rap, electronic music, phonk, and flamenco with "behaviour"; rock and roll with "personality"; and, finally, rock and roll, flamenco, and reggaeton with "values", although, in this last case, the relationship is negative.

6. Discussion and conclusions

The results of this study show that the styles that participants listen to the most are confined to a very small circle within popular urban music. This is one feature that differs from previous studies, where a wider range of listening is displayed (Cremades et al., 2010), and it highlights, even more if possible, the importance of the social factor and the shaping of the identity of young people at present (Bonneville-Roussy & Rust, 2018). In this way, the data obtained classify musical styles around the following dimensions:

(1) Urban music: rap originated and evolved in the outlying neighbourhoods of the big cities, with sub-styles such as trap and phonk. This last sub-style

distances itself from more commercial sounds in search of more DIY productions. Trap is much simpler than rap, and centres more on experimenting with sound effects, always giving voice to the everyday reality of life in neighbourhoods (Werner, 2023).

(2) Latin music: this includes dembow, reggaeton, and bachata, styles that are all danceable music. The first two of them also share a sexualised vision of the woman, who dances sensually guided by the man (Oberst et al., 2016).

(3) Technological music: Techno and electronic music are based on experimental use of advanced technological tools to provide a futuristic image.

(4) Mainstream music: even though their musical characteristics are different, pop and dance are what adolescents listen to most from the charts, in line with the arguments of Gutiérrez and Ubani (2023).

(5) Musical fusion: this includes two different styles, namely rock and roll and flamenco, which perhaps share the musical mixing of fusion with other styles. Furthermore, their followers identify themselves with an image, a way of dressing, and a strong personality (Morrison, 2017).

Equally, in this grouping, the difficulties deriving from the fact that artists increasingly compose songs that fuse elements of different styles has been considered, coinciding with the ideas of Pedrero-Esteban et al. (2019). Thus, in this case, this classification has grouped styles that include exclusively musical aspects as well as social ones.

The data obtained according to differences by age range shows that older students have a broader range of listening than younger ones, with the "musical fusion" dimension standing out in their listening. This could perhaps be explained by access to this type of music, that can be shared in contexts and spaces for young adults. This access would also explain why they listen to "technological music" more, which, along with "urban music" and "mainstream music", makes up the majority of the sonic landscape of adolescents (Cremades et al., 2010).

By gender, and in line with previous studies (Lorenzo et al., 2021; Soares-Quadros, et al., 2019), women prefer the dimensions of "Latin music" and "mainstream music" owing to their more danceable character, and because of the meaning of following the trends of the moment. Meanwhile, men listen more to the styles of "musical fusion" and "technological music", which have a strong identity component, with particular aesthetics associated in the way of dressing or in the personality of their listeners.

In relation to the association of their musical preferences with stereotypes, the most cited were those of "personality", "generation", and "behaviour". Something that can be explained in that these, in particular personality, are the ones that most concern adolescents in accordance with the ideas of McLean and Thorne (2003). In contrast, despite the studies that show the continued existence of gender stereotypes (Wener, 2023), participants in this study appear not to see that they are present in their musical preferences. With regards to age range, and as in the case of gender, the older students seem to be more aware of the presence of stereotypes in music. With the exception of the "gender" and "physical appearance" stereotypes, they identify those of "behaviour", "personality", "generation", and "way of dressing" as stereotypes explicitly present in the dissemination of music that they prefer, above all through music videos, as Gutiérrez and Ubani note (2023). With regards to gender, female respondents associate the music they listen to with their "personality" and "generation", perhaps because it awakens the emotions with which they identify more (Račevska & Tadinac, 2019). All of this has been reflected in the close relationship between musical styles and stereotypes, which leads us to confirm the previous arguments. For example, the correlations between reggaeton and trap with the stereotype of "generation" make clearly apparent that both styles are present and have greater following in the present generation (Werner, 2023). This correlation also appears between styles such as rap, phonk, and flamenco with the "way of dressing", a stereotype related to the particular aesthetic of rappers (Rentfrow & Gosling, 2007).

All of this evidence shows that the participants in this study are aware of some of the stereotypes present in their musical preferences, which proves the transcendent role of urban popular music. This perspective casts light on the pertinence of establishing this type of music as a generative core on which to base a transversal approach to a wide variety of topics relating to music education in secondary school. In this sense, it is also advisable to analyse gender stereotypes of this type of music on platforms or in music vide-

os. The aim is to provide students with the necessary tools to recognise them and break with the prejudices present in this field as a way of building a more inclusive musical identity.

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References

Bonneville-Roussy, A., y Rust, J. (2018). Age trends in musical preferences in adulthood: 2. Sources of social influences as determinants of preferences. *Musicae Scientiae*, *22* (2), 175-195. https://doi.org/10.1177/1029864917704016

Colley, A. (2008). Young people's musical taste: Relationship with gender and gender-related traits. *Journal of Applied Social Psychology, 38* (8), 2039-2055. https://doi.org/10.1111/j.1559-1816.2008.00379.x

Cremades, R., Lorenzo, O., y Herrera, L. (2010). Musical tastes of secondary school students' with different cultural backgrounds: A study in the Spanish North African city of Melilla. *Musicae Scientiae*, *14* (1), 121-141. https://doi.org/10.1177/102986491001400105

DeNora, T. (2017). Music-ecology and everyday action. Creating, changing, and contesting identities. En R. MacDonald, D. J. Hargreaves and D. Miell (Eds.), *Handbook of musical identities* (pp. 46-62). Oxford University Press.

DeWall, C. N., Pond, R. S., Campbell, W. K., y Twenge, J. M. (2011). Tuning in to psychological change: Linguistic markers of psychological traits and emotions over time in popular U.S. song lyrics. *Psychology of Aesthetics, Creativity, and the Arts, 5* (3), 200-207. https://doi.org/10.1037/a0023195

Dobrota, S., y Ercegovac, I. R. (2015). The relationship between music preferences of different mode and tempo and personality traits-implications for music pedagogy. *Music Education Research*, *17* (2), 234-247. https://doi.org/10.1080/14613808.2014.933790

Dobrota, S., Ercegovac, I. R., y Habe, K. (2019). Gender differences in musical taste: The mediating role of functions of music. *Društvena istraživanja*, *28* (4), 567-586. https://doi.org/10.5559/di.28.4.01

Evans, P. A., y McPherson, G. E. (2017). Processes of musical identity consolidation during adolescence. En R. MacDonald, D. J. Hargreaves, y D. Miell (Eds.), *Oxford handbook of musical identities* (pp. 213-231). Oxford University Press.

Gutiérrez, M., y Ubani, C. (2023). Un marco conceptual de la cosificación sexual de las mujeres en videos musicales [A conceptual framework of the sexual objectification of women in music videos]. *Feminismo/s*, (42), 27-60. https://doi.org/10.14198/fem.2023.42.02

Hallam, S. (2010). The power of music: Its impact on the intellectual, social and personal development of children and young people. *International Journal of Music Education*, *28* (3), 269-289. https://doi.org/10.1177/0255761410370658

Hargreaves, D. J., Comber, C., y Colley, A. (1995). Musical likes and dislikes: The effects of age, gender, and training in British secondary school pupils. *Journal of Research in Music Education*, *43* (3), 242-250. https://doi.org/10.2307/3345639

Hargreaves, D. J., MacDonald, R., y Miell, D. (2012). Musical identities mediate musical development. En G. E. McPherson, y F. G. Welch (Eds.), *The Oxford handbook of music education* (pp. 125-142). Oxford University Press.

Hargreaves, D. J., North, A. C., y Tarrant, M. (2006). Musical preference and taste in childhood and adolescence. En G. E. McPherson (Ed.), *The child as musician: A handbook of musical development* (pp. 135-154). Oxford University Press.

Hargreaves, D., North, A., y Tarrant, M. (2015). How and why do musical preferences change in childhood and adolescence? En G. E. McPherson (Ed.), *The child as musician: A handbook of musical development [El niño como músico: manual de desarrollo musical]* (2.ª ed.) (pp. 303-322). Oxford University Press.

Herrera, L., Soares-Quadros Jr., J. F., y Lorenzo, O. (2018). Music preferences and personality in Brazilians. *Frontiers in Psychology*, *9*, 1488. https://doi.org/10.3389/fpsyg.2018.01488

Knifsend, C. A., y Juvonen J. (2014). Social identity complexity, cross-ethnic friendships, and intergroup attitudes in urban middle schools. *Child Development*, *85* (2), 709-721. https://doi.org/10.1111/cdev.12157

Kurtz-Costes, B., Copping, K. E., Rowley, S. J., y Kinlaw, C. R. (2014). Gender and age differences in awareness and endorsement of gender stereotypes about academic abilities. *European Journal of Psychology of Education*, *29* (4), 603-618. https://doi.org/10.1007/s10212-014-0216-7

Lonsdale, A. J., y North, A. C. (2017). Self-to-stereotype matching and musical taste: Is there a link between self-to-stereotype similarity and self-rated music-genre preferences? *Phycology of music*, *45* (3), 307-320. https://doi.org/10.1177/0305735616656789

Lorenzo-Quiles, O., Soares-Quadros, J. F. Jr., y Abril, J. E. (2021). Musical preferences of Brazilian high school students [Preferencias musicales de los estudiantes de secundaria brasileños]. *PLoS ONE*, *16* (6), e0253353. https://doi.org/10.1371/journal.pone.0253353

MacDonald, R., Hargreaves, D. J., y Miell, D. (Eds.) (2017). *Handbook of musical identities.* Oxford University Press.

Marín-Liébana, P., Blasco, J. S., y Botella, A. M. (2021). Las preferencias musicales de los estudiantes: hacia un reconocimiento de sus identidades culturales [Students' musical preferences: towards recognition of their cultural identities]. *Vivat Academia. Revista de Comunicación*, (154), 43-67. http://doi.org/10.15178/va.2021.154.e1236

McLean, K. C., y Thorne, A. (2003). Late adolescents' self-defining memories about relationships. *Developmental Psychology, 39* (4), 635-645. https://doi.org/10.1037/0012-1649.39.4.635.

Megías, I., y Rodríguez, E. (2003). *Jóvenes entre sonidos: hábitos, gustos y referentes musicales [Young people among sounds: habits, tastes and musical references].* FAD (Fundación de Ayuda contra la Drogadicción).

Morrison, M. D. (2017). The sound(s) of subjection: Constructing American popular music and racial identity through black-sound. *Women & Performance: a journal of feminist theory*, *27* (1), 13-24. https://doi.org/10.1080/0740770X.2017.1282120

Oberst, U., Chamarro, A., y Renau, V. (2016). Gender stereotypes 2.0: Self-representations of adolescents on Facebook. *Comunicar*, *24* (48), 81-90. https://doi.org/10.3916/C48-2016-08

Pedrero-Esteban, L., Barrios-Rubio, A., y Medina-Ávila, V. (2019). Teenagers, smartphones and digital audio consumption in the age of Spotify. *Comunicar*, *27* (60), 103-112. https://doi.org/10.3916/C60-2019-10

Račevska, E., y Tadinac, M. (2019). Intelligence, music preferences, and uses of music from the perspective of evolutionary psychology. *Evolutionary Behavioral Sciences, 13* (2), 101-110. https://doi.org/10.1037/ebs0000124

Reeves, A., Gilbert, E., y Holman, D. (2015). Class dis-identification, cultural stereotypes, and music preferences: experimental evidence from the UK. *Poetics*, *50*, 44-61. https://doi.org/10.1016/j.poetic.2015.01.002

Rentfrow, P. J., y Gosling, S. D. (2003). The do re mi's of everyday life: The structure and personality correlates of music preferences. *Journal of Personality and Social Psychology, 84* (6), 1236-1256. https://doi.org/10.1037/0022-3514.84.6.1236

Rentfrow, P. J., y Gosling, S. D. (2007). The content and validity of music-genre stereotypes among college students. *Psychology of Music*, *35* (2), 306-326. https://doi.org/10.1177%2F0305735607070382

Rentfrow, P. J., Goldberg, L. R., y Levitin, D. J. (2011). The structure of musical preferences: A five-factor model. *Journal of Personality and Social Psychology, 100* (6), 1139-1157. https://doi.org/10.1037/a0022406

Roulston, K., y Misawa, M. (2011). Music teachers' constructions of gender in elementary education. *Music Education Research*, *13* (1), 3-28. https://doi.org/10.1080/14613808.2011.553275

Soares-Quadros, J. F. Jr., Lorenzo, O., Herrera, L., y Araújo Santos, N. S. (2019). Gender and religion as factors of individual differences in musical preference. *Musicae Scientiae*, *23* (4), 525–539. https://doi.org/10.1177/1029864918774834

Striphas, T. (2015). Algorithmic culture. *European Journal of Cultural Studies, 18* (4-5), 395-412. https://doi.org/10.1177/1367549415577392

Susino, M., y Schubert, E. (2019). Cultural stereotyping of emotional responses to music genre. *Psychology of Music*, *47* (3), 342-357. https://doi.org/10.1177%2F0305735618755886

Symonds, J. E., Hargreaves, J. J., y Long, M. (2017). Music in identity in adolescence across school transition. En R. MacDonald, D. J. Hargreaves, y D. Miell (Eds.), *Oxford handbook of musical identities* (pp. 510-526). Oxford University Press.

Thomas, K. S. (2016). Music preferences and the adolescent brain: A review of literature. *Update: Applications of Research in Music Education*, *35* (1), 47-53. https://doi.org/10.1177/8755123315576534

Werner, A. (2020). Organizing music, organizing gender: algorithmic culture and Spotify recommendations. *Popular Communication*, *18* (1), 78-90. https://doi.org/10.1080/15405702.2020.1715980

Werner, A. (2023). *Feminism and gender politics in mediated popular music*. Bloomsbury Academic.

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Bibliometric study of the scientific production on music education in Spain (1978–2022)

Estudio bibliométrico de la producción científica de educación musical en España (1978-2022)

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Abstract:

This work aims to identify the principal journals with the most scientific production on music education by Spanish authors, to establish a ranking of the most cited articles and Spanish authors with the most scientific contributions, and to determine the most researched trends in music education over time in Spain. The sample comprises all articles by Spanish authors listed in the WoS and Scopus databases (peer-reviewed) from 1978 to 2022. The final sample comprises 1001 articles, 1372 authors, and 293 journals. The analysis of the information is based on productivity and dispersion indicators (Price's, Bradford's, and Lotka's bibliometric laws), impact indicators (JIF, H index) and collaboration, scientific mapping, and multivariate multiple correspondence factor analysis. The results show an annual rate of increase of music research by Spanish authors of 11.96%, with growth increasing from 2000 and becoming exponential since 2010. Asymmetrical productivity was found in journals and authors, with many articles being concentrated in a small group of journals and authors. It was also observed that the most relevant research trends in music education up to 2022 related to methodology, teacher training, technology, creativity, innovation, performance, emotions, music therapy, interculturality and inclusive education.

Keywords: music education, journals, bibliometric analysis, scientific maps, scientific production, literature review, music research.

Resumen:

Los objetivos de este trabajo han sido identificar las principales revistas con mayor producción científica de autoría española sobre educación musical, establecer un *ranking* de los artículos más citados y de los autores españoles con mayor número de contribuciones científicas, y determinar las tendencias más investigadas en educación musical a lo largo del tiempo en España. Para la configuración de la muestra, se seleccionaron todos los artículos de autoría española publicados en las bases de datos WoS y Scopus (revisados por pares) desde 1978 hasta 2022. La muestra final alcanzó los 1001 artículos, 1372 autores y 293 revistas. El análisis de la información se ha fundamentado en indicadores de productividad y de dispersión (leyes bibliométricas de Price, de Bradford y de Lotka), indicadores de impacto (JIF, índice H) y de colaboración, mapeo científico y técnica multivariante del análisis factorial de correspondencias múltiples. Los resultados revelan una tasa de crecimiento anual de la investigación musical realizada por autores españoles del 11.96%, con un mayor crecimiento a partir de 2000, que se convierte en exponencial desde 2010. Se constató una productividad asimétrica tanto en las revistas como en la autoría, de forma que gran parte de los artículos se concentraban en un grupo reducido de revistas y autores. Asimismo, se observó que las tendencias investigadas más relevantes en educación musical hasta 2022 estaban relacionadas con metodología, formación del profesorado, tecnología, creatividad, innovación, *performance*, emociones, musicoterapia, interculturalidad y educación inclusiva.

Palabras clave: educación musical, revistas, análisis bibliométrico, mapas científicos, producción científica, revisión bibliográfica, investigación musical.

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1. Introduction

Scientific production in music education has increased considerably over recent years and, as a consequence, so has the existence of journals specialising in music (Anglada-Tort & Sanfilippo, 2019; Calderón & Gustems, 2018; Marín-Suelves et al., 2022; Morales et al., 2017). Notable among the most recent Spanish production relating to music education is research into musical methodologies (García-Gil & Cremades-Andreu, 2019; Rodríguez-Quiles, 2023); curriculum, analysis of didactic materials and resources (Aróstegui, 2016; Chao-Fernández et al., 2020; Cores & Rodríguez, 2023); digital competence (Colás-Bravo & Hernández-Portero, 2023; Serrano, 2017); teacher training (Bautista et al., 2019; Cuervo et al., 2023); comparative education (Lorenzo et al., 2023; Mateu-Luján, 2020); cultural aspects and students' musical preferences (Cuadrado-García et al., 2023; Marín-Liébana & Botella-Nicolás, 2020); emotional education (Bonastre Vallés & Nuevo Benítez, 2020; Montiel-Guirado & Clares-Clares, 2023), and the influence of music on social and psychological development (Cabedo-Mas et al., 2023; Lorenzo, 2020), among others.

Given this increase in music research, bibliometrics make it possible to decipher and represent the accumulated knowledge, making sense of a large volume of data. Donthu et al. (2021) note that the aim of bibliometric analysis is to apply quantitative methods to data about scientific production, enabling the bibliometric and intellectual structure of a field to be identified and studied through analysis of the social and structural relations between the different components of the research (authors, countries, institutions, topics, journals, etc.). Owing to the large number of scientific documents, specific techniques are required to analyse scientific production and its impact or analyse collaborative or thematic networks (Vélez-Estévez et al., 2023). In this sense, it is necessary to recall that the principal bibliometric techniques are citation, co-citation, co-authorship, and co-words (Zupic & Čater, 2015).

Bibliometric analysis can be applied to a wide variety of academic fields (Ellegaard & Wallin, 2015). However, bibliometric methods are not used as frequently in education as in other fields; only 1.34%, compared to 27.23% in information and library sciences or 21.86% in computer science, as found in the recent study by Verma et al. (2023). This work also identifies the most productive countries in bibliometric research, with the leading positions being held by China, the USA, and Spain, followed by Brazil, the UK, Germany, and Canada.

In bibliometric studies, we can differentiate between studies that analyse the performance of articles and journals to discover emerging trends and patterns of collaboration and other studies that focus on a specific area of the existing bibliography with the aim of exploring its intellectual structure (Donthu et al., 2021). There are studies of both types in music education. Notable works from the first group of bibliometric research include Hancock and Price (2020), who analysed the production of the *Journal of Research in Music Education* (JRME); Anglada-Tort and Sanfilippo (2019), who reviewed the publications *Psychology of Music*, *Music Perception*, and *Musicae Scientiae*; and Rohwer (2018), who studied the content of the *International Journal of Community Music*.

The other group of studies includes authors who research specific topics, such as Özenç-Ira and Gültekin (2022), who performed a bibliometric study of musical creativity. They note its growth over the last two decades, especially in the USA and the UK (which are the countries with the highest output in studies on this topic relating to psychology, cognitive science, and neuroscience), and in Spain (one of the countries with most research on musical creativity in educational and curricular aspects). Li et al. (2021) carried out a bibliometric analysis of 1004 publications on music therapy recorded in WoS, identifying a notable increase from the year 2000. Levine et al. (2023) analyse music research in the field of medicine over fifty years and note a proliferation of research relating to neuroscience, alternative therapies, and music therapy. We can also mention some current reviews of literature on music, such as the one by He et al. (2023) on musical creativity in children or the one by Blackwell et al. (2023) on feedback in music education.

In the case of Spain, there are various studies comprising bibliometric analyses of music education, albeit to a lesser extent than in other countries such as the USA or China. Among them, we should note the work by Morales et al. (2017), who, in their bibliometric analysis of Spanish articles

listed in WoS from 2000 to 2015, find an increase in journals specialising in music education and a dispersion of related journals, while, at the same time, noting the limited impact of music publications compared with other areas. We should also note the study by Calderón and Gustem (2018), whose analysis of the scientific production of 447 articles published in journals indexed in Journal Citation Reports (JCR) from 2006 to 2017 reflects an increase in this production over the years. However, they also note the limited repercussion that research in music education has compared with other areas, as it receives very few citations.

We also found bibliometric studies or systematic reviews on more specific topics. Marín-Suelves et al. (2022) perform a bibliometric analysis in WoS and Scopus on technology in music education and confirm the increase in publications over the last five years, with the USA and Spain standing out as the most productive countries. Vargas-Serrano et al. (2023) analyse the situation of music in primary and secondary schools and conservatories after the pandemic, noting collaboration through online platforms and students' musical creativity. Olvera-Fernández et al. (2023) offer a review of innovative methodologies in music education. Monreal-Guerrero and Herrero (2023) analyse research centred on YouTube as a tool for learning music. And Fernández-Barros et al. (2023) review studies on the benefits of peer tutoring in musical contexts.

Having reviewed the literature relating to the object of study, this work aims to provide an overview of research in music education over time, based on the principal bibliometric laws proposed by Ardanuy (2012), namely: Price's law, which analyses the increase in scientific production in a specific field of research; Bradford's law, which studies the asymmetric distribution of journals by their publications in a discipline; and Lotka's law, which describes the unequal productivity of authors in a given area. The main aims of this work, taking into account the aforementioned laws and bibliometric techniques, are to identify the principal journals with the most scientific production by Spanish authors on music education, to establish a ranking of the most cited articles and Spanish authors with the most scientific contributions, and to determine the most researched trends in music education over time in Spain.

2. Method

2.1. Methodological design

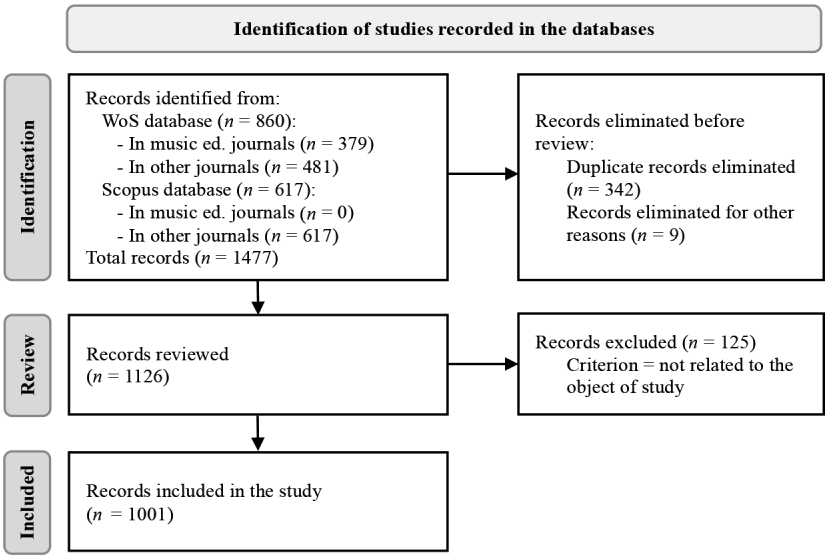
The bibliometric method was used to provide a quantitative analysis of the publications written (Ellegaard & Wallin, 2015). We started by selecting data. Although the number of databases has increased in recent years (Vélez-Estévez, 2023), we restricted this study to WoS and Scopus, given the broad cover they provide and the quality of the citations of the articles (Martín-Martín et al., 2018). The information was then analysed using bibliometric indicators. The production was presented by means of science maps with the objective of creating a representation of an area by dividing documents, authorship, journals or words into different groups (Zupic & Čater, 2015).

2.2. Data collection

The search for information was divided into two phases. The first included all peer-reviewed articles by Spanish authors published in music education journals indexed in WoS and Scopus. To do so, we selected journal articles only as document type; Spain as the country; and from the earliest record to 2022 for the publication date. We also identified articles by Spanish authors relating to music education published in any other journal by carrying out an advanced search in the two databases. For this search, we limited the title and keywords using the following terms: music and education, sound and education, music and school, teaching and music, teachers and music, learning and music, and music and children. The results we obtained comprised 860 articles in WoS and 617 in Scopus. We should note that, in the case of Scopus, we excluded any journals already included in WoS.

In the second phase, we exported the data from WoS and Scopus in BibTex format and combined them into a single file using the Rstudio program. Duplicate articles (n = 247) were automatically eliminated. Nonetheless, we also performed a manual review, eliminating other duplicate articles not identified by the software (n = 95) and others that did not fulfil the established criterion of being published before 2023 (n = 9). Afterwards, we reviewed the titles and abstracts of the articles with the aim of excluding any that were not directly related to music education (n = 125). The final sample comprised 1001 articles by Spanish authors. Figure 1 shows the general process for collecting information from the articles recorded in the databases.

FIGURE 1. Process of identification, review, and inclusion of records from WoS and Scopus.



Source: adapted from the diagram by Page et al. (2021).

2.3. Data analysis

The data analysis was based on the bibliometric laws proposed by Ardanuy (2012), which make it possible to establish general explanations and seek statistically regular behaviours over time in scientific production and information. This work studies the following ones:

- The law of exponential increase (Price's law). Price established that scientific production grew very rapidly and doubled every ten or fifteen years.

- The law of dispersion of scientific bibliography (Bradford's law). This law states that most of the bibliography on a topic will be concentrated in a very small group of journals. If the journals are put in decreasing order of productivity, they can be split into three groups, with a third of the articles in each. The first group, the *Bradford core*, comprises very few journals; the second, quite a few journals; and the third, the bulk of journals (ratio 1: n: n^2).

- Law of productivity of authors (Lotka's law). Lotka found a quantitative relationship between authorship and the number of articles published. This law states that the productivity of authors shows an uneven distribution, and so there is a small group of highly productive researchers and a large number of authors with low productivity.

In addition to the indicators of productivity and dispersion mentioned above, we calculated other bibliometric indicators, such as impact indicators (JIF, H index) and collaboration indicators. Equally, with regards to citations, we considered whether they are global citations or local citations, in other words, whether they come from the whole body of articles that are found in the databases consulted or, on the contrary, from the articles that comprise the sample of this study.

In addition, during the analysis process, we used science mapping. This is a bibliometric method that makes it possible to create a visual representation of the structure of an area of research and uses analysis techniques such as citation, co-citation, co-authorship, and co-words, among others (Zupic & Čater, 2015). The structures represented in this work relate to the journals (map of co-citations), authorship (map of collaboration with authors), and keywords (thematic map). The latest was prepared using the multivariant technique of multiple correspondence analysis (MCA) in order to represent a conceptual structure of the field and a grouping of documents that express shared concepts. In this case, the results are interpreted based on the relative positions of the points and their distribution across the dimensions; the more similar the words are, the closer they are on the map (Cuccurullo et al., 2016). Table 1 displays the variables analysed and the type of analysis performed with each of them.

Table 1. Structure of the data analysis.

Units of analysis	Type of analysis	Bibliometric techniques or indicators
Articles (n = 1001)	Growth since 1978	Price's law
	Mean articles cited per year	Citations
	Ranking of the 10 most-cited articles	Global citations and local citations
Journals (n = 293)	Ranking of the 10 journals with the most articles	Productivity
	Distribution of the production of the journals	Bradford's law
	Ranking of the journals with the greatest impact	H-index and JIF
	Science map of journals cited at least 30 times by authors	Co-citations
Authors (n = 1372)	Authors with most articles	Productivity
	Distribution of the production of the authors	Lotka's Law
	Ranking of the universities	Productivity
	Map of collaboration by authors	Co-authors
Keywords: (n = 2589)	Ranking of the most frequent words	Frequency
	Trends researched	Frequency
	Thematic map of keywords	Multiple correspondences

To analyse the data, we used the RStudio, Bibliometrix (Aria & Cuccurullo, 2017), and VOSviewer programs (Van Eck & Waltman, 2017). In addition, we utilised the SPSS program for inferential analysis (correlation, regression analysis, and ANOVA) establishing $\alpha = .05$ as the critical value in the interpretation of the results.

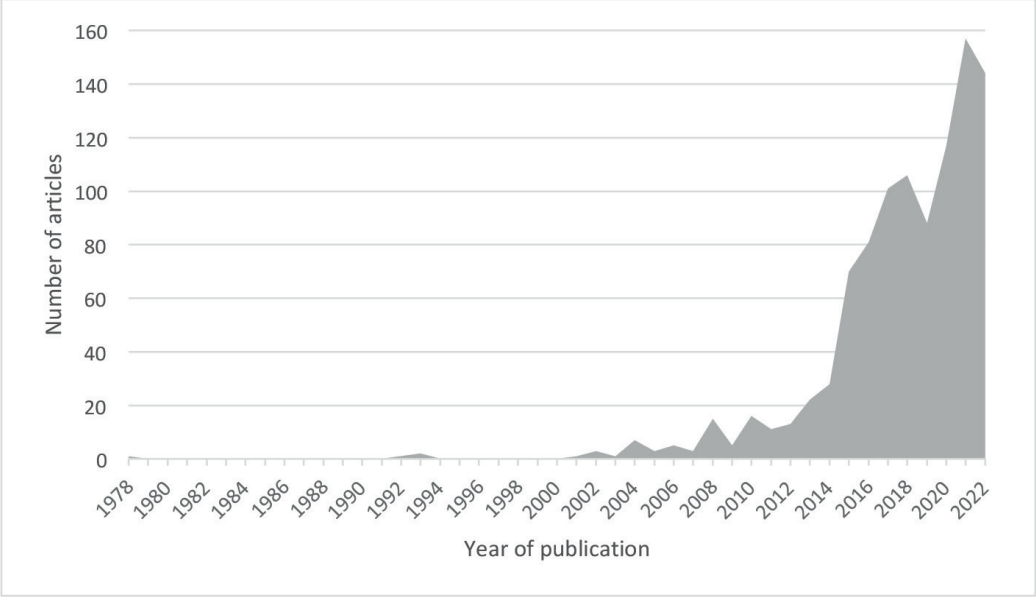
3. Results

3.1. Articles and journals

The first article recorded in the databases was from 1978, although it was not until 2000 that scientific production started to increase, with 2021 being the year with the most articles published (n = 157) (Figure 2). The mean articles per year was 22.24, with a variability of 42.54 *(SD)* and an annual growth rate of 11.96%. There is a significant relationship between the number of articles and the year of publication according to the correlation, $r_s = .890$, $p < .001$; the simple linear regression analysis with the coefficient of determination $R^2 = .524$; and ANOVA, $F(1, 43) = 47.255$, $p < .001$.

The extraordinary increase in this production over the last decade should be noted, as the figures for the

Figure 2. Annual academic production.



correlation are higher from 2010, r_s = .962, p <.001. Besides, the regression analysis confirmed Price's exponential increase, with a goodness of fit of 87%, R^2 = .878, and with a significant relationship according to ANOVA, $F(1, 11)$ = 79.467, p <.001.

The articles from the sample have a mean of four citations (M = 4.005) and a variability of nine citations (SD = 9.047), although the number of citations of the articles has varied over time. Articles from 1993, 2008, and 2013 had the most citations, while ones from later years had lower mean citations, with this figure decreasing as they became more recent (Figure 3).

The articles that recorded the most global citations in WoS and Scopus from any field exceeded 100 and corresponded with the field of psychology more than education. Table 2 presents the ranking of the articles with the most global citations.

FIGURE 3. Mean citations received per article.

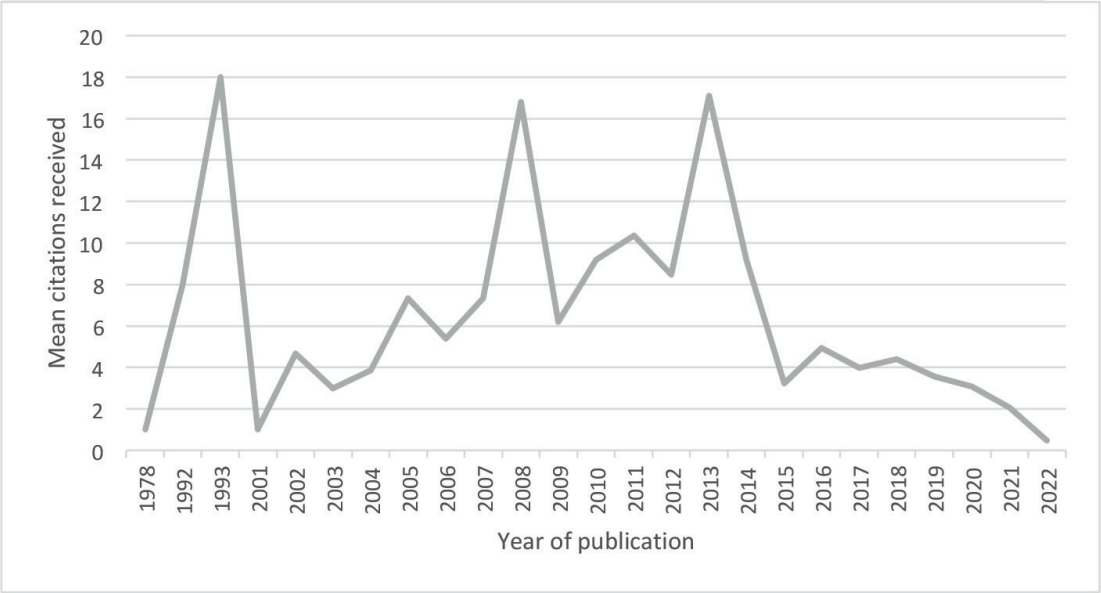


TABLE 2. Ranking of music articles with the most global citations.

	Título del artículo	Autoría	Año	Revista	Citaciones
1.	Individual differences in music reward experiences	Mas-Herrero et al.	2013	*Music Perception*	151
2.	Effects of music learning and piano practice on cognitive function, mood and quality of life in older adults	Seinfeld et al.	2013	*Frontiers in Psychology*	122
3.	Structural neuroplasticity in expert pianists depends on the age of musical training onset	Vaquero et al.	2016	*Neuroimage*	82
4.	Modulation of functional connectivity in auditory–motor networks in musicians compared with nonmusicians	Palomar-García et al.	2017	*Cerebral Cortex*	61
5.	Effects of phonological and musical training on the reading readiness of native- and foreign-Spanish-speaking children	Herrera et al.	2011	*Psychology of Music*	46
6.	Developing music teacher identities: An international multi-site study	Ballantyne et al.	2012	*Inter. Journal of Music Education*	44
7.	Self-determination theory applied to flow in conservatoire music practice: The roles of perceived autonomy and competence, and autonomous and controlled motivation	Valenzuela et al.	2018	*Psychology of Music*	44

8.	Synaesthesia: The existing state of affairs	Hochel & Milán	2008	*Cognitive Neuropsychology*	43
9.	Musical practice as an enhancer of cognitive function in healthy aging - A systematic review and meta-analysis	Román-Caballero et al.	2018	*Plos One*	43
10.	Exploring the global decline of music education	Aróstegui	2016	*Arts Education Policy Review*	41

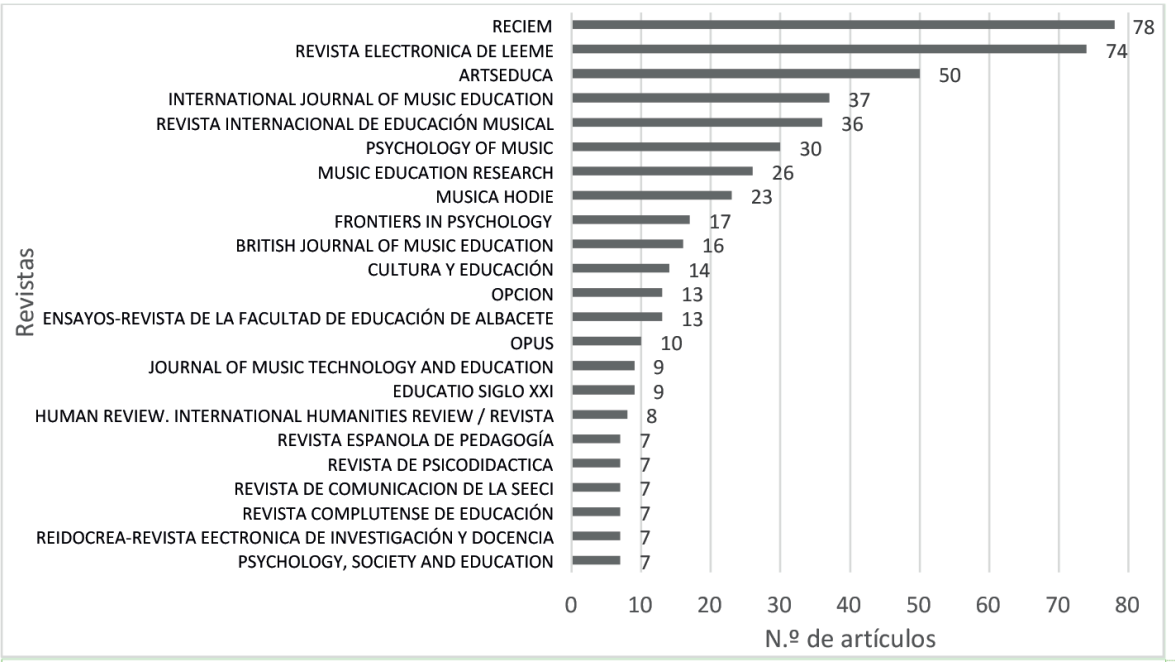
However, articles in the field of music education received only fourteen citations from within the sample of this study (local citations), although, in this case, the distribution of works linked to the context of psychology and that of education was more balanced (Table 3).

TABLE 3. Articles with most local citations.

	Article title	Authorship	Year	Journal	Citations
1.	Music performance teachers' conceptions about learning and instruction: A descriptive study of Spanish piano teachers	Bautista et al.	2010	*Psychology of Music*	14
2.	Metas y estrategias para una práctica constructiva en la enseñanza instrumental [Targets and strategies for a constructive practice in teaching musical instruments]	Torrado & Pozo	2008	*Cultura y Educación*	10
3.	The influence of music learning cultures on the construction of teaching-learning conceptions	Casas-Mas et al.	2014	*British Journal of Music Education*	10
4.	The older, the wiser? Profiles of string instrument teachers with different experience according to their conceptions of teaching, learning, and evaluation	López-Íñiguez et al.	2014	*Psychology of Music*	10
5.	Using the musical score to perform: A study with Spanish flute students	Marín et al.	2012	*British Journal of Music Education*	7
6.	Music teachers professional competences: From a theoretical framework to a concrete proposal	Carrillo	2015	*Revista Internacional de Educación Musical*	7
7.	Piano students' conceptions of musical scores as external representations: A cross-sectional study	Bautista et al.	2009	*Journal of Research in Music Education*	6
8.	Musical tastes of secondary school students with different cultural backgrounds: A study in the Spanish north African city of Melilla	Cremades-Andreu et al.	2010	*Musicae Scientiae*	6
9.	Formal music education not only enhances musical skills, but also conceptions of teaching and learning: A study with woodwind students	Marín	2013	*European Journal of Psychology of Education*	6
10.	La educación musical en la formación básica en España. El problema de la dispersión curricular [Music education in basic education in Spain: The problem of curricular dispersion]	Belletich et al.	2016	*Perspectiva Educacional*	6

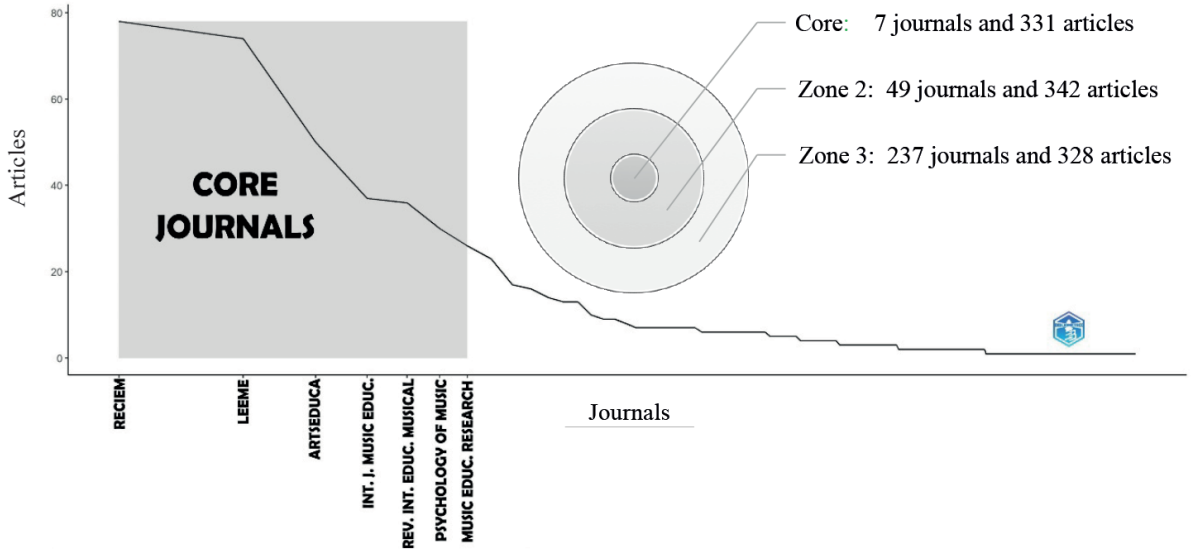
The 1001 articles in the study sample were published in a total of 293 journals. Figure 4 shows the ranking of the journals with the most articles on music education by Spanish authors. It should be noted that four of the top five journals were Spanish.

FIGURE 4. Ranking of journals with the most articles.



As for the distribution of articles in the different academic journals according to Bradford's law, we have established three zones (core, zone 2, and zone 3). These had approximately the same number of articles, but the principal core of articles published by Spanish authors comprised seven journals (Figure 5). This law is confirmed by the strong negative correlation between the two variables, r_s = -.939, p <.001; the coefficient of determination of the regression analysis, R^2 = .881; and the significant results of the ANOVA, $F(1, 291) = 2164.645$, p <.001. That is to say, 88% of the variance in the publication of articles of the journals is explained by their position in the ranking.

FIGURE 5. Core journals: Bradford's law.



As shown in Table 4, of the 293 journals in the sample, the ones that have the most impact within the analysed location of Spain differ considerably from those that contain more articles by Spanish authors shown above in Figure 4. This difference is principally because of the number of citations the published articles receive, which determines the H index of the journal. Therefore, when a journal has published fewer articles, but these articles have been widely cited by Spanish authors, they can have a higher H index than other journals with more publications but fewer citations.

TABLE 4. Journals with the greatest local impact factor.

	Journal	H-index	JIF	Articles	Citations	Year of 1st article*	Index (WoS)
1.	*Psychology of Music*	10	1.7	30	312	2010	SSCI
2.	*International Journal of Music Education*	9	1.8	37	262	2003	SSCI
3.	*Music Education Research*	8	2.3	26	169	2008	SSCI
4.	*Cultura y Educación*	7	0.7	14	136	2008	SSCI
5.	*Frontiers in Psychology*	7	3.8	17	221	2013	SSCI
6.	*Revista Electrónica Complutense de Investigación en Educación Musical-RECIEM*	7	1.0	78	224	2004	ESCI
7.	*British Journal of Music Education*	6	2.0	16	113	2011	SSCI
8.	*Music Perception*	5	2.3	5	211	2006	SSCI
9.	*Revista Complutense de Educación*	5	1.6	7	36	2010	ESCI
10.	*Revista de Psicodidáctica*	5	3.6	7	50	2007	SSCI

*Year of the first article published by Spanish authors.

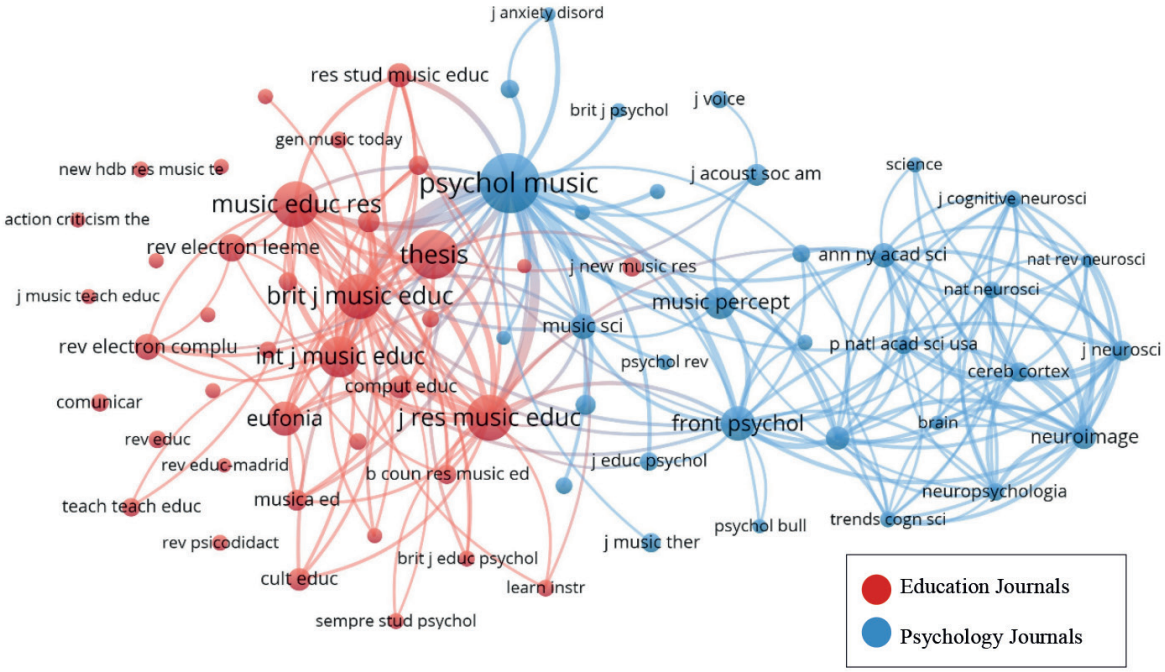
There were 19 880 references in the articles in the sample. The journals cited most often in these references were *Psychology of Music*, *Thesis*, *Music Education Research*, *Journal of Research in Music Education*, *British Journal of Music Education*, and *International Journal of Music Education*, all of which had more than three hundred citations (Table 5). Taking into account those journals cited thirty times or more (n = 72), two large related groups were established, one comprising music education journals and journals from the field of education and another comprising journals connected to the field of psychology (Figure 6).

TABLE 5. Most-cited journals from the sample as a whole.

	Journal	Citations *(F)*	Strength of relationship*
1.	*Psychology of Music*	559	10586
2.	*Thesis*	368	3553
3.	*Music Education Research*	321	5280
4.	*Journal of Research in Music Education*	320	6057
5.	*British Journal of Music Education*	308	5172
6.	*International Journal of Music Education*	259	4164
7.	*Frontiers in Psychology*	182	4541
8.	*Eufonía*	178	1691
9.	*Music Perception*	159	2959
10.	*Revista Electrónica LEEME*	117	1279

*This value indicates the total number of times that the journal has been cited along with other journals.

FIGURE 6. Groups of most-cited journals (n = 72).

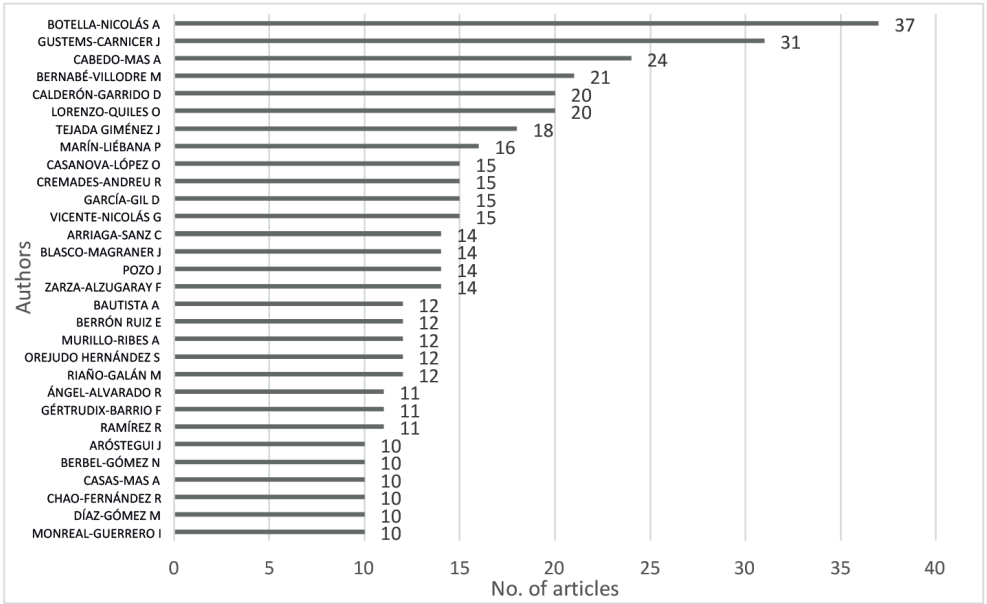


Note: visualisation of two groups of journals. The colour represents journals in the same group; the size of the circle, the number of co-citations of the journal; and the distance between the circles, the relationship between two journals.

3.2. Authorship and university institutions

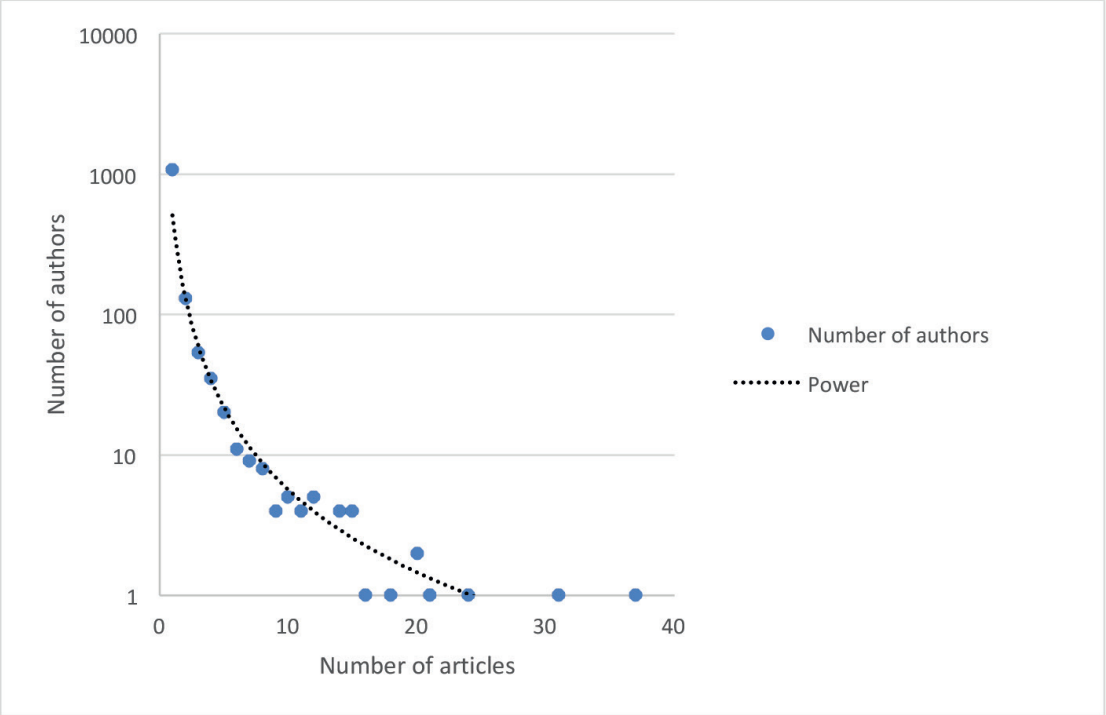
Of the 1372 authors who published the total of 1001 articles, 78.2% published one article; 9.4%, two articles; 10.2%, three to nine, and only 30 authors (2.18%) published ten or more. These authors are listed in Figure 7.

FIGURE 7. Authors with the most articles.



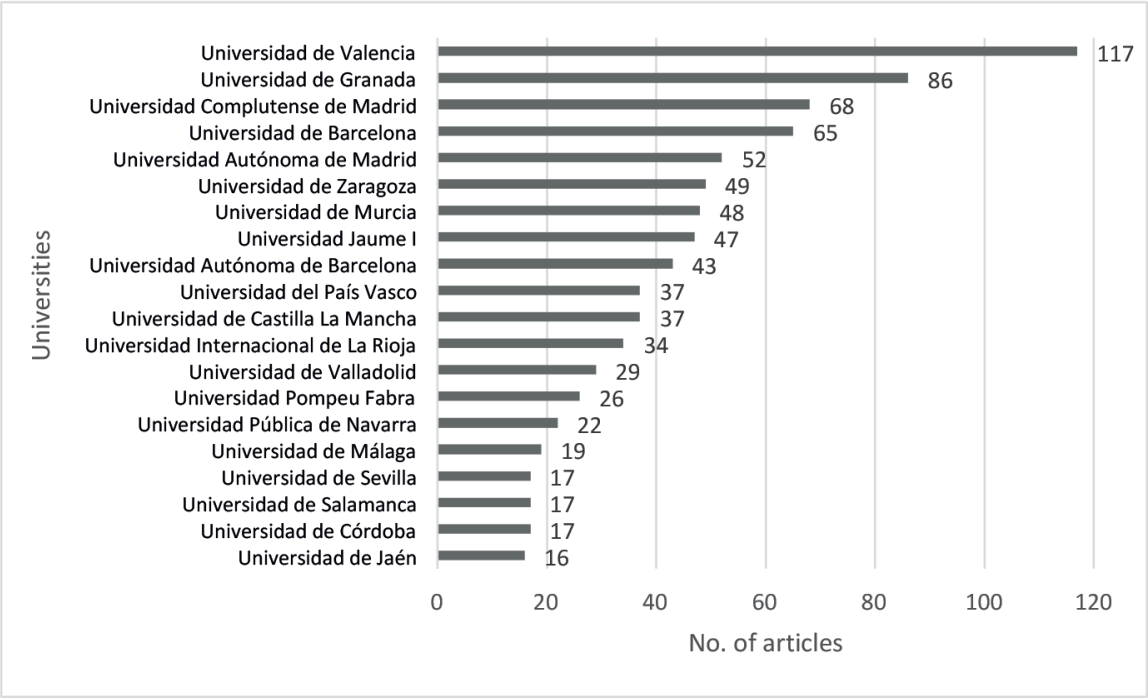
If we consider the productivity of the authors, Figure 8 shows that many of them published one or two articles, but the number of authors falls as the at number of articles increases with a strong negative correlation of r_s = -.964, p <.001 and so a very small group of authors published more articles, reflecting the uneven distribution of scientific production described in Lotka's law with a fit of 94%, R^2 = .947, and a significant relationship between these variables according to the ANOVA, $F(1, 19) = 342.657$, p <.001.

Figure 8. Productivity of authors: Lotka's law.



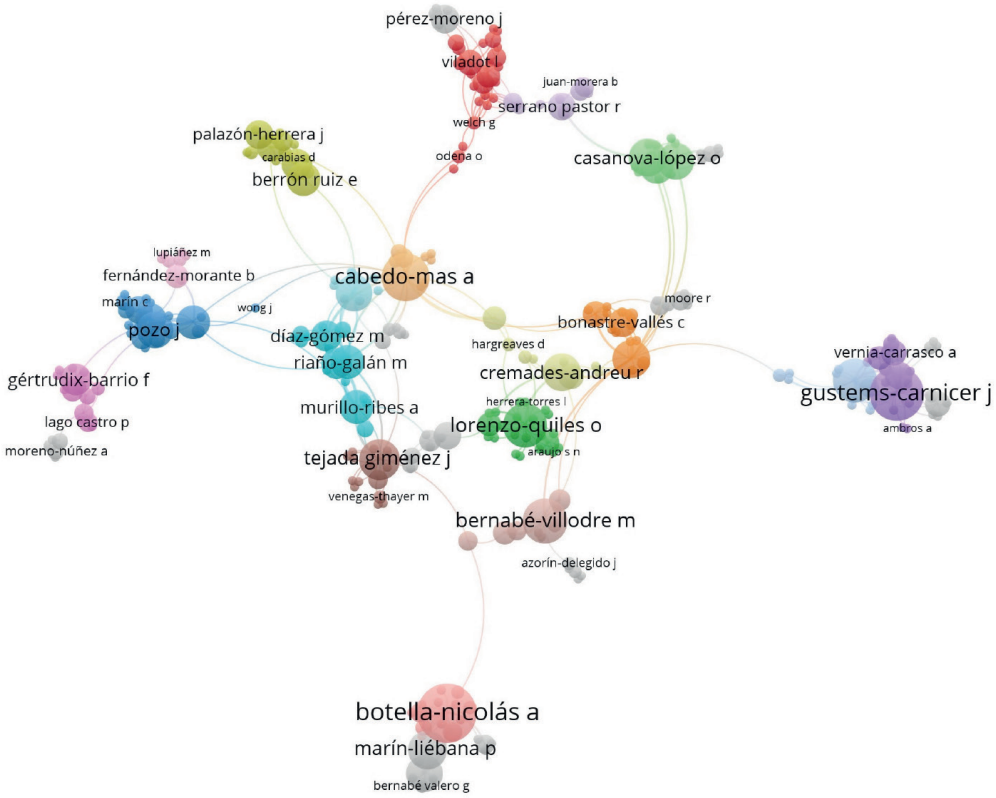
The universities of Valencia and Granada, the Universidad Complutense de Madrid, the Universitat de Barcelona, and the Universidad Autónoma de Madrid stood out as the Spanish universities with the most scientific production in music education, with more than fifty articles published each (Figure 9).

Figure 9. Ranking of universities.



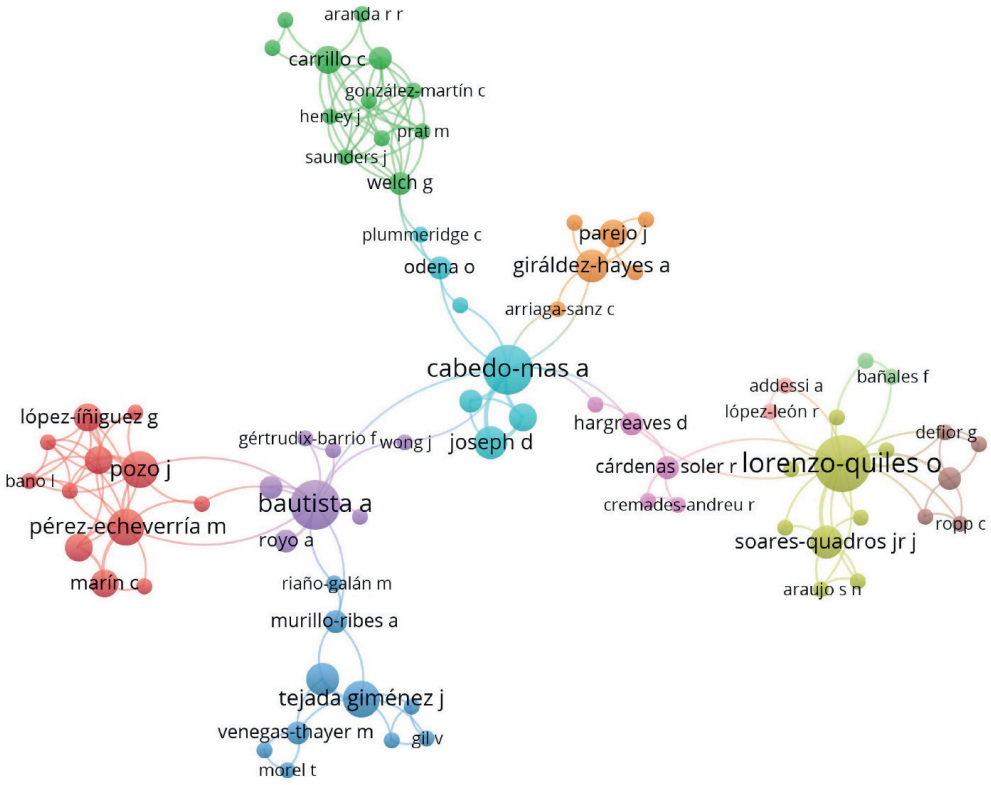
With regards to collaboration in scientific production in Spain, 25.37% of articles had a single author while the others had two or more authors, with a mean of 2.41 co-authors per article. Figure 10 shows twenty-nine collaborative groups in the area of study (there are other groups of authors who publish jointly but do not appear in this network because they are not related with the principal collaborative groups). These groups comprise 313 authors, that is to say, 22.81% of the total authors are involved in the most collaborations.

FIGURE 10. Network of collaboration of the study authors.



Collaboration by Spanish authors with foreign authors was found in 10.89% of works, among which we note twenty-two collaborations with the United Kingdom (2.2%), eleven with the USA (1.1%), nine co-authorships with Brazil and another nine with Australia, eight collaborations with Chile, and six each with Canada, China, and Germany. Figure 10 shows collaborations with other countries. These collaborations result in eleven groups comprising seventy-seven authors from different countries, which means that 5.6% of the total number of authors do more publications with foreign authors (Figure 11).

FIGURE 11. Network of collaboration of Spanish authors with foreign authors.



3.3. Keywords and topics

A total of 2589 keywords were included in the 1001 articles, the most frequent ones being *teaching methods*, *teacher training*, *technology*, and *primary education*, all of them with values greater than 75 (Table 6).

TABLE 6. Keywords cited most in the sample as a whole.

	Keywords	*F*		Keywords	*F*
1.	Teaching methods	105	11.	Early-childhood education	40
2.	Teacher training	88	12.	Innovation	40
3.	Technology	86	13.	Emotions	30
4.	Primary education	76	14.	Intercultural education	30
5.	Higher education	56	15.	Music therapy	28
6.	Creativity	54	16.	Motivation	26
7.	Conservatories	53	17.	Instrumental learning	24
8.	Curriculum	44	18.	Inclusive education	22
9.	Secondary education	43	19.	Interdisciplinarity	20
10.	Performance	40	20.	Gender	20

Regarding the evolution of keywords over the last decade, we found that the most current ones were *textbooks*, *e-learning*, and *Covid-19*. The ones that have persisted the most over the last ten years are *conservatory*, *intercultural education*, *rhythm*, and *informal education* (Figure 12).

FIGURE 12. Most frequent keywords over the years.

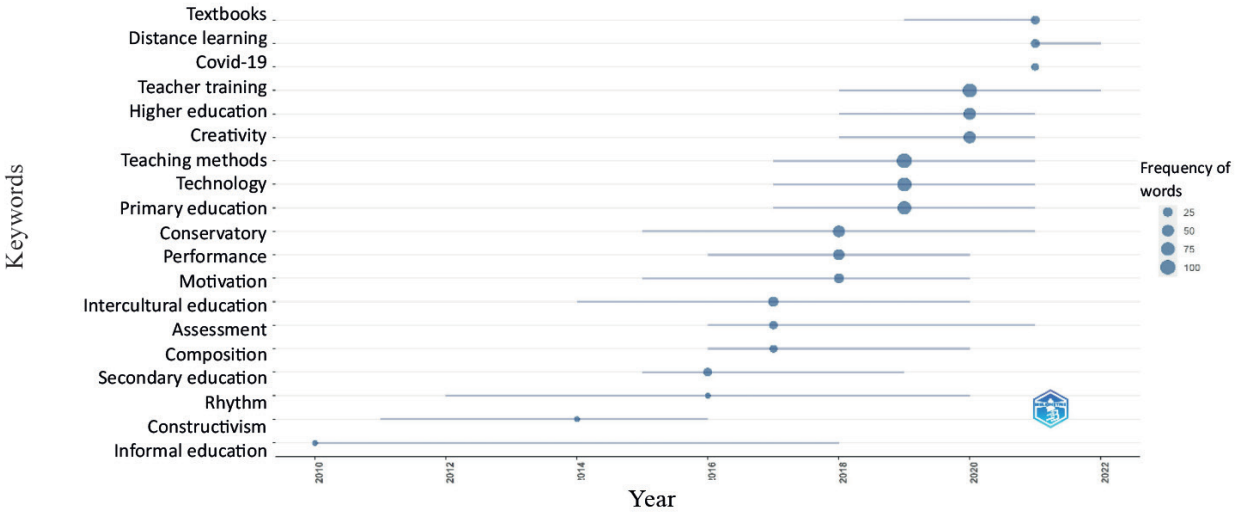
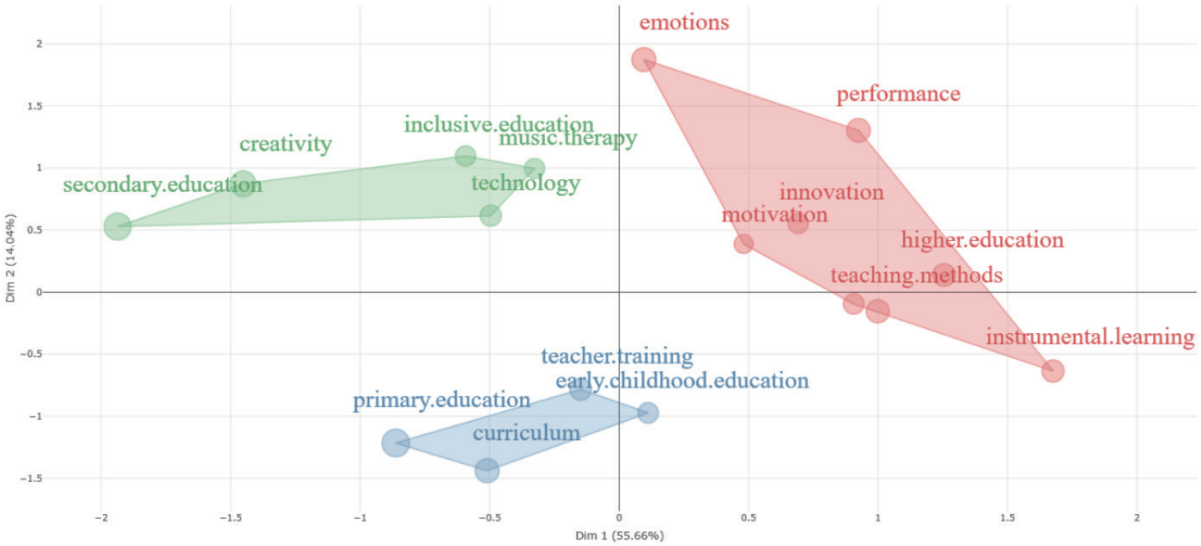


Figure 13 is a thematic map derived from the factor analysis of multiple correspondences that shows three large areas of research. Although any topic can be researched at any educational stage, an association of general topics with particular stages was observed. Accordingly, the first group (red) encompasses research in higher education and conservatories, related principally with methodology, performance, instrumental learning, and emotions. The second group (blue) shows that articles on early-childhood education and primary education more frequently research aspects relating to the curriculum and teacher training. Finally, the third group (green) includes studies on secondary education, associated with topics of creativity and technology, among others.

FIGURE 13. Thematic map of the articles' keywords.



Considering that MCA aims to explain the greatest possible inertia in the different axes, the previous map can be said to be capable of identifying the most significant relations between variables, given that the two dimensions explain almost 70% of the total inertia (55.66% the first and 14.04% the second); in other words, a large proportion of the articles that share similar topics are represented and associated.

4. Discussion and conclusions

The results of this study confirm that scientific production in music education has grown in recent years, as previous studies observed (Anglada-Tort & Sanfilippo, 2019; Calderón & Gustems, 2018; Marín-Suelves et al., 2022; Morales et al., 2017; Özenç-Ira & Gültekin, 2022). In Spain, music research grew very quickly from 2000, and this growth became exponential from 2010, fulfilling Price's law on increase.

As for citations of music education articles, we can conclude than the mean number of citations (M = 4) is similar to the figure of 3.91 citations in earlier studies (Calderón & Gustems, 2018) and slightly higher than the mean of 2.96 observed by Morales et al. (2017). This increase should be regarded as something positive, although it is still far from the mean of the articles that are more related with musical psychology or music therapy, which is around seventeen citations (Anglada-Tort & Sanfilippo, 2019; Li et al., 2021). Indeed, the articles cited most internationally correspond more with the field of psychology than education and exceed one hundred citations. In contrast, our analysis of local citations reveals that the most-cited articles in Spanish musical research exclusively belong to the field of education, with the particular feature that they have received a considerably smaller number of citations, just fourteen. The greater dissemination or impact, in terms of citations, of articles that belong to or relate to the field of psychology raises the question of whether music education researchers should prioritise these topics when choosing their topics if they want to achieve a high impact in their publications. Accordingly, an article on the musical preferences of students would logically have fewer potential journals interested in it than if its topic matter covered, for example, musical preferences and emotions, or musical preferences and disruptive behaviour in adolescents. The importance and validity of the interdisciplinarity of knowledge are not questioned, but, to some extent, are researchers in music education not sometimes obliged to divert those strictly musical-educational lines to be able to publish more or in *more prestigious* journals? This idea has already been addressed by Mantie (2022), whose approaches point in the same direction as this study and who argues that "If you want a high score, you must publish in the right journals (which tend to be *medical* rather than *social* in orientation)" (p. 25). The results of this research do not answer this question, but considering it in future studies would be of interest.

Regarding the productivity of journals, other studies (Calderón & Gustems, 2018) have identified an unequal distribution, in line with Bradford's law. In

other words, the articles published are concentrated in a very small group of journals. In Spain, seven journals make up this core, although they do not all have the same impact. In contrast with other areas where the journals with the highest impact publish the most articles (Silva-Díaz et al., 2022), in this study, only half of the journals with the largest output are the ones with the greatest impact in Spanish music research: *Psychology of Music*, *International Journal of Music Education*, *Music Education Research*, and *Revista Electrónica Complutense de Investigación en Educación Musical-RECIEM*.

As with the journals, the productivity of authors has an asymmetric distribution, with a small number publishing most on music education, as established by Lotka's law and confirmed by different studies on aspects of music (Marín-Suelves et al., 2022; Özenç-Ira & Gültekin, 2022). In the case of collaboration between authors, the mean number of co-authors is 2.41. This is very close to the figure of 2.61 established in earlier Spanish works (Morales et al., 2017), although it is somewhat lower than the mean number of co-authors of articles on musical psychology, which is 4.4 (Anglada-Tort & Sanfilippo, 2019). Three quarters of the articles involve collaboration between Spanish authors, and only one in ten, with foreign authors as well. The United Kingdom, the United States, Brazil, and Australia, which are the most productive countries in bibliometrics and the ones that carry out the most collaborations, are most notable (Verma et al., 2023).

The most important trends in research in music education up to 2022 in Spain relate to methodology, teacher training, technology, creativity, innovation, performance, emotions, music therapy, interculturality, and inclusive education, among others. A variety of authors have identified Spain as one of the most productive countries in some of these topics; for example, in music education and technology (Marín-Suelves et al., 2022) or in musical creativity (Özenç-Ira & Gültekin, 2022). Other trends such as music therapy, emotions, and teacher training or performance were also identified in earlier works (Anglada-Tort & Sanfilippo, 2019) and are still the subject of research in Spain at present.

On the other hand, it can be said that the musical research by the Spanish authors is directed at all educational stages, being more frequent in primary education and higher education, and less frequent in secondary education and early-childhood education. Similarly, although the articles in this work cover a wide variety of topics in each educational level, we have identified some general lines that are investigated in each level.

The main limitation of this study is that the sample consisted of scientific production from two databases; therefore, Spanish research on music education that is not recorded in them was not included in the analysis. Furthermore, we should note that the information that the databases collect is not always complete or accurate, a limitation that we have reduced as much as possible through exhaustive revision and manual correction of the data. In addition to these, there are other limitations typical of bibliometric analyses. For example, as more recent articles have had less time to be cited, this measure is biased towards older publications (Zupic & Čater, 2015). Also, there are limitations deriving from the quantitative method, given that, while the present work studies the general structure of scientific production of music education through a descriptive analysis and analyses of correlation and regression, it does not analyse in depth each of the units of analysis studied (articles, authors, journals, and keywords). Finally, as possible lines of future research, it would be of interest to assess the study variables with other quality indexes, expand the sample with other databases, and complement the information with scientific production in books, contributions to music education conferences held in Spain or contributions by Spanish authors at conferences held in other countries.

References

Anglada-Tort, M., & Sanfilippo, K. R. M. (2019). Visualizing music psychology: A bibliometric analysis of *psychology of music*, *music perception*, and *musicae scientiae* from 1973 to 2017. *Music and Science, 2,* 1-18. https://doi.org/10.1177/2059204318811786

Ardanuy, J. (2012). *Breve introducción a la bibliometría [A brief introduction to bibliometrics]*. Universitat de Barcelona. https://diposit.ub.edu/dspace/bitstream/2445/30962/1/breve%20introduccion%20bibliometria.pdf

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11* (4), 959-975. https://doi.org/10.1016/j.joi.2017.08.007

Aróstegui, J. L. (2016). Exploring the global decline of music education. *Arts Education Policy Review*, *117* (2), 96-103. http://dx.doi.org/10.1080/10632913.2015.1007406

Bautista, A., Wong, J., & Cabedo-Mas, A. (2019). Music teachers' perspectives on live and video-mediated peer observation as forms of professional development. *Journal*

of Music Teacher Education, *28* (3), 28-42. https://doi.org/10.1177/1057083718819504

Blackwell, J., Matherne, N., & McPherson, G. E. (2023). A PRISMA review of research on feedback in music education and music psychology. *Psychology of Music*, *51* (3), 716-729. https://doi.org/10.1177/03057356221109328

Bonastre, C., & Nuevo, R. (2020). Learning strategies on musical expression in higher education and emotional intelligence. *Revista Internacional de Educación Musical*, *8* (1), 43-51. https://doi.org/10.1177/2307484120956515

Cabedo-Mas, A., Moliner-Miravet, L., Campayo-Muñoz, E., Macián-González, R., & Arriaga-Sanz, C. (2023). Impact of group music-making on social development: A scoping review. *Journal for the Study of Education and Development*, *46* (2), 352-384. https://doi.org/10.1080/02103702.2023.2173384

Calderón, D., & Gustems, J. (2018). Anàlisi bibliomètrica de la producció científica sobre educació musical en el període 2007-2016 en revistes incloses en JCR [Bibliometric analysis of the scientific production on music education in the period 2007-2016 in journals included in JCR]. *BiD: Textos Universitaris de Biblioteconomia i Documentació*, 41. http://dx.doi.org/10.1344/BiD2018.41.9

Chao-Fernández, R., Vázquez-Sánchez, R., & Felpeto-Guerrero, A. (2020). Audacity como herramienta para la creación de materiales educativos. Una aproximación a través del MOOC "Música para el siglo XXI" [Audacity as a tool for the creation of educational materials. An approach through the MOOC "Music for the 21st century"]. *Revista Latinoamericana de Tecnología Educativa-RELATEC*, *19* (1), 121-137. https://doi.org/10.17398/1695-288X.19.1.121

Colás-Bravo, P., & Hernández-Portero, G. (2023). Relationship between the use of ICT in secondary education music teaching and teachers' beliefs. *Education in the Knowledge Society*, *24*, e28509. https://doi.org/10.14201/eks.28509

Cores, A., & Rodríguez J. (2023). Analysis of cultural heritage in music didactic materials in Galicia. *International Journal of Music Education*, *41* (2), 241-255. https://doi.org/10.1177/02557614221107915

Cuadrado-García, M., Montoro-Pons, J. D., & Miquel-Romero, M.-J. (2023). Music studies as cultural capital accumulation and its impact on music genre preferences. *International Journal of Music Education*, *41* (1), 38-51. https://doi.org/10.1177/02557614221092417

Cuccurullo, C., Aria, M., & Sarto, F. (2016). Foundations and trends in performance management. A twenty-five years bibliometric analysis in business and public administration domains. *Scientometrics*, *108*, 595-661. https://doi.org/10.1007/s11192-016-1948-8

Cuervo, L., Bonastre, C., Camilli, C., Arroyo, D., & García, D. (2023). Digital competences in teacher training and music education via service learning: A mixed-method research project. *Education Sciences*, *13* (459), 1-24. https://doi.org/10.3390/educsci13050459

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*, 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

Ellegaard, O., & Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, *105* (3), 1809-1831. https://doi.org/10.1007/s11192-015-1645-z

Fernández-Barros, A., Duran, D., & Viladot, L. (2023). Peer tutoring in music education: A literature review. *International Journal of Music Education, 41* (1), 129-140. https://doi.org/10.1177/02557614221087761

García-Gil, D., & Cremades-Andreu, R. (2019). *Flipped classroom* en educación superior. Un estudio a través de relatos de alumnos [Flipped classroom in higher education. A study of student statements]. *Revista mexicana de investigación educativa*, *24* (80), 101-123. https://www.scielo.org.mx/scielo.php?script=sci_arttext-typid=S1405-66662019000100101

Hancock, C. B., & Price, H. E. (2020). Sources cited in the *Journal of Research in Music Education*: 1953 to 2015. *Journal of Research in Music Education*, *68* (2), 216–240. https://doi.org/10.1177/0022429420920579

He, J., Wing, C. K., & Hoe, T. W. (2023). The cultivation of children's musical creative practical competency: A literature review. *Thinking Skills and Creativity*, *48* (1), 101309. https://doi.org/10.1016/j.tsc.2023.101309

Levine, Z., Campbell, M., Adil, A., Kruger, S., & Alter, D. A. (2023). The 50-year proliferation of music medical science research: A bibliometric review. *Music and Medicine*, *15* (1), 48-51. https://doi.org/10.47513/mmd.v15i1.903

Li, K., Weng, L., & Wang, X. (2021). The state of music therapy studies in the past 20 years: A bibliometric analysis. *Frontiers in Psychology*, *12*, 1-14. https://doi.org/10.3389/fpsyg.2021.697726

Lorenzo, M. (2020). Las escuelas de música y los proyectos musicales socioeducativos y comunitarios. Modelos educativos, retos y contextos [Music schools and music socioeducational and community projects. Educational models, challenges and contexts]. *Artseduca*, *27*, 36-52. https://doi.org/10.6035/Artseduca.2020.27.3

Lorenzo, O., Cárdenas, R. N., Soares-Quadros, J. F., & Ortiz-Marcos, J. M. (2023). Curriculum and training analysis of the music degrees in Colombia. *International Journal of Music Education*. https://doi.org/10.1177/02557614231152310

Mantie, R. (2022). Struggling with good intentions: Music education research in a *post* world. *Research Studies in Music Education*, *44* (1), 21-33. https://doi.org/10.1177/1321103X211056466

Marín-Liébana, P., & Botella Nicolás, A. M. (2020). Las preferencias musicales de los estudiantes de 5.º y 6.º de educación primaria. Una oportunidad para implementar un enfoque de tipo sociocrítico [Musical preferences of 5th and 6th grade primary school students. An opportunity to implement a socio-critical approach]. *Revista Internacional de Educación Musical*, *8* (1), 15-24. https://doi.org/10.1177/2307484120956512

Marín-Suelves, D., Gabarda, V., & Cuevas, N. (2022). Educación musical y tecnología: tendencias en investigación [Music education and technology: Trends in research]. *Revista Electrónica Complutense de Investigación En Educación Musical*, *19*, 275-286. https://doi.org/10.5209/reciem.74693

Martín-Martín, A., Orduna-Malea, E., Thelwall, M., & Delgado, E. (2018). Google Scholar, Web of Science, and Scopus: A systematic comparison of citations in 252 subject categories. *Journal of Informetrics*, *12* (4), 1160-1177. https://doi.org/10.1016/j.joi.2018.09.002

Mateu-Luján, B. (2020). La educación musical en España dentro del currículo obligatorio de educación secundaria. Estudio comparado entre comunidades autónomas [The music education in Spain within the compulsory curriculum of secondary education. A comparative study among the autonomous communities]. *Revista Española de Educación Comparada*, (37), 338-354. https://doi.org/10.5944/reec.37.2021.27541

Monreal-Guerrero, I. M., & Herrero, S. (2023). YouTube as informal music learning resource for teenage users. Systematic review. *HUMAN REVIEW. International Humanities Review / Revista Internacional de Humanidades*, *18* (3), 1-14. https://doi.org/10.37467/revhuman.v18.4886

Montiel-Guirado, E., & Clares-Clares, E. (2023). Ansiedad escénica en estudiantes de enseñanzas profesionales de música [Scenic anxiety in professional music education studies learners']. *Revista Electrónica de LEEME*, 51, 1-15. https://doi.org/10.7203/LEEME.51.24337

Morales, A., Ortega, E., Conesa, E., & Ruiz-Esteban, C. (2017). Análisis bibliométrico de la producción científica en educación musical en España [Bibliometric analysis of academic output in music education in Spain]. *Revista Española de Pedagogía*, *75* (268), 399-414. https://doi.org/10.22550/REP75-3-2017-07

Olvera-Fernández, J., Montes-Rodríguez, R., & Ocaña-Fernández, A. (2023). Innovative and disruptive pedagogies in music education: A systematic review of the literature. *International Journal of Music Education*, *41* (1), 3-19. https://doi.org/10.1177/02557614221093709

Özenç-Ira, G., & Gültekin, M. (2022). Making interdisciplinary connections through music: A systematic review of studies in general schooling context in Turkey. *International Journal of Music Education*, *41* (4), 631–650. https://doi.org/10.1177/02557614221137867

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., [...] & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, *372* (71). https://doi.org/10.1136/bmj.n71

Rodríguez-Quiles, J. A. (2023). The conservatories of music facing the challenges arising from the pandemic. HUMAN REVIEW. *International Humanities Review / Revista Internacional de Humanidades*, *18* (1), 1-18. https://doi.org/10.37467/revhuman.v18.4859

Rohwer, D. A. (2018). A content analysis of the *International Journal of Community Music*, 2008-18. *International Journal of Community Music*, *11* (3), 353-362. https://doi.org/10.1386/ijcm.11.3.353_1

Serrano, R. M. (2017). Tecnología y educación musical obligatoria en España: referentes para la implementación de buenas prácticas [Technology and compulsory music education in Spain: References for the implementation of good practices]. *Revista Electrónica Complutense de Investigación en Educación Musical*, *14*, 153-169. http://dx.doi.org/10.5209/RECIEM.54848

Silva-Díaz, F., Fernández-Ferrer, G., Vásquez-Vilchez, M., Ferrada, C., Narváez, R., & Carrillo-Rosúa, J. (2022). Tecnologías emergentes en educación STEM. Un análisis bibliométrico de las publicaciones en Scopus y WoS (2010-2020) [Emerging technologies in STEM education. A bibliometric analysis of publications in Scopus y WoS (2010-2020)]. *Bordón. Revista de Pedagogía*, *74* (4), 25-44. https://doi.org/10.13042/Bordon.2022.94198

Van Eck, N. J., & Waltman, L. (2017). Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics*, *111* (2), 1053-1070. https://doi.org/10.1007/s11192-017-2300-7

Vargas-Serrano, A., Luque, A., Sandri, P., & Morales-Cevallos, M. B. (2023). Music in Spanish schools, high schools and conservatories: Educational response strategies against the Covid-19 pandemic. *IJERI: International Journal of Educational Research and Innovation*, (19), 123-134. https://doi.org/10.46661/ijeri.7001

Vélez-Estévez, A., Perez, I. J., García-Sánchez, P., Moral-Muñoz, J. A., & Cobo, M. J. (2023). New trends in bibliometric APIs: A comparative analysis. *Information Processing and Management*, *60* (4), 103385. https://doi.org/10.1016/j.ipm.2023.103385

Verma, M. K., Khan, D., & Yuvaraj, M. (2023). Scientometric assessment of funded scientometrics and bibliometrics research (2011-2021). *Scientometrics*, *128* (8), 4305-4320. https://doi.org/10.1007/s11192-023-04767-6

Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, *18* (3), 429-472. https://doi.org/10.1177/1094428114562629

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Music education's contribution to the development of EI in adolescents and its effect on the gender variable[1]

Contribución de la educación musical en el desarrollo de la IE de los adolescentes y su efecto en la variable género

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Abstract:

Emotional intelligence is a psychological variable that affects personal well-being and transcends the educational field. It is known that learning music provides emotional benefits for people and that emotional intelligence varies by age and gender. Based on these principles, we propose this research with the following objectives: to measure the perceived emotional intelligence of adolescent students of obligatory secondary education from Valencia, to compare by the variables of *musician-non-musician* and *gender*; and to explore the effect of music on the perceived emotional intelligence of young musicians considering *gender* as a variable. The final sample comprised a total of 409 adolescents of between 11 and 16 years of age. The data collection tools were an ad hoc sociodemographic questionnaire and the Trait Meta-Mood Scale (TMMS-24). The results of the statistical analyses displayed significant differences by *gender* in emotional *attention*; a positive correlation between *age* and *attention*, which increases with progress through adolescence; and a significant effect that reveals greater emotional *clarity* in musicians. This effect occurs independently of the gender of the subject, and so it benefits boys and girls equally.

Keywords: emotional intelligence, adolescence, music education, music, gender, educational research, emotional well-being, emotional attention, academic performance, education, music training, emotional repair.

Resumen:

La inteligencia emocional es una variable psicológica que afecta al bienestar personal y trasciende al ámbito educativo. Se sabe que el aprendizaje de la música aporta beneficios emocionales a las personas y que la inteligencia emocional varía en función de la edad y el género. A partir de estos principios, planteamos esta investigación con los siguientes objetivos: medir la inteligencia emocional percibida de adolescentes valencianos estudiantes de Educación Secundaria Obligatoria, establecer una comparativa según las variables músico-no músico y género, así como explorar el efecto que la música ejerce en la inteligencia emocional percibida de los jóvenes músicos en función de la variable género. La muestra final estuvo compuesta por un total de 409 adolescentes de entre 11 y 16 años. Las herramientas de recogida de datos fueron un cuestionario sociodemográfico confeccionado *ad hoc* y la Trait Meta-Mood Scale (TMMS-24). Los resultados de los análisis estadísticos presentaron diferencias significativas de *género* en *atención* emocional; una correlación positiva entre la *edad* y la *atención*, que aumenta según la persona se adentra en la adolescencia; y un efecto significativo que revela una mayor *claridad* emocional a favor de los músicos; tal beneficio se produce con independencia del género del sujeto, lo que significa que afecta por igual a chicas y a chicos.

Palabras clave: inteligencia emocional, adolescencia, educación musical, música, género, investigación educativa, bienestar emocional, atención emocional, rendimiento académico, educación, formación musical, reparación emocional.

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1. Introduction

Emotional intelligence (EI) is the ability to handle one's own emotions and those of others, to differentiate between them, and to make use of that information to guide one's own thought and actions (Mayer et al., 2011). Experts consider emotion to be one of the basic mental operations. Two simultaneous mechanisms are at work in it: the sensory and the cognitive (Bisquerra, 2015), and EI stands out within this field. This construct developed from the concept *social intelligence*, defined by Thorndike (1920) as the ability to act consciously in human relations (Molero et al., 1998). Gardner (2016) took up this idea, identifying two forms of emotional intelligence: interpersonal, which considers the behaviour, feelings, and motivations of others; and intrapersonal intelligence, principally involved in the examination and knowledge of one's own feelings. Goleman later popularised the concept in his book *Emotional intelligence*.

Three factors are differentiated in the intrapersonal form of this model of perceived EI.

> Attention to feelings is the degree to which people believe they pay attention to their emotions and feelings (i.e., "I constantly think about my emotional state"); emotional clarity refers to how people think they perceive their emotions (i.e., "I am frequently wrong about my emotions"); finally, emotional repair alludes to the subjects' belief in their capacity to interrupt and regulate negative emotional states and prolong positive ones (i.e., "Although I sometimes feel sad, I usually have an optimistic outlook"). (Fernández-Berrocal & Extremera, 2005, pp. 74-75)

From an intrapersonal perspective on EI, it is known that people with moderate-low scores in emotional attention and high scores in emotional clarity and repair achieve better levels of adaptation. In contrast, extremely high levels in emotional attention are related to emotional maladjustment. If the people who display this do not have an adequate level of clarity and repair, they could enter an emotional spiral resulting in a ruminative process (Extremera & Fernández-Berrocal, 2005), including the creation of symptoms of anxiety, depression, and stress (Delhom et al., 2023).

In turn, there is a clear significant correlation between the ability to recognise emotions in performances of classical music and EI (Hallam, 2010). This finding suggests that this capacity is based on some of the same sensibilities that comprise everyday EI and that the remaining musical capacities can be transferred to other activities if processes required share similarities (Hallam, 2010).

The present research will report on the differences in EI by age, gender, and relationship with music displayed by a group of adolescent students of obligatory secondary education (Enseñanza Secundaria Obligatoria, ESO). Given that this psychological variable is closely related to school outcomes, special attention will be paid to the synergies that previous research works have found in the positive effect of musical praxis and its repercussions in the academic field of young people.

1.1. Emotional intelligence and education

An intelligent person was traditionally considered to be one who obtained the best academic results. However, as Fernández-Berrocal and Extremera (2002) note, this idea started to be questioned some time ago as it did not guarantee success in the professional sphere or in everyday life. And, at that critical moment, the concept of EI as an alternative to the traditional vision of an intelligent individual emerged.

A lack of EI in students is associated with four specific problems in education: (a) a deficit in students' levels of well-being and psychological adjustment, (b) a reduction in the quantity and quality of interpersonal relationships, (c) a fall in academic performance, and (d) the appearance of disruptive behaviour and use of addictive substances. Therefore, students with better EI development display better psychological adjustment and emotional well-being, they have more interpersonal networks and of higher quality, and they display a lower tendency towards disruptive, aggressive, and violent behaviours. Equally, as they confront stressful situations with more ease, they perform better at school and consume addictive substances such as alcohol, tobacco etc. in smaller quantities (Extremera & Fernández-Berrocal, 2004).

In 2020, 90% of EI programmes implemented in educational centres had very positive effects on students: they improved their emotional and social skills, and they acquired the capacity to learn to confront academic difficulties in class and to regulate their emotions. These achievements were greater in primary education (Puertas-Molero et al., 2020), although a correlation between EI and academic performance was also observed in post-obligatory education students (Del Rosal et al., 2018).

Faced with this need to strengthen emotional development in individuals and society (Pastor et al., 2019), teachers must play an essential role. People's emotional

competences ought to be developed right from their initial training onwards (Iryhina et al., 2020), as the educational sphere is ideal for the benefits to spread to all of the citizens.

1.2. Emotional intelligence, age, and gender

EI varies by age (Salguero et al., 2010) and gender (Fernández-Berrocal et al., 1998; Pena et al., 2011, and Thayler et al., 2003, as cited in Extremera & Fernández-Berrocal, 2005). Studying this psychological variable in different groups gives an overview of its scope in multiple areas, including the study of development in adolescence. Thanks to these works, different psychological patterns can be established. For example, people with moderate-low scores in emotional attention and high clarity and repair scores achieve a better level of psychological adaptation (Extremera & Fernández-Berrocal, 2005). Similarly, lower levels of emotional clarity and repair in adolescents are often related to depressive behaviour (Extremera & Fernández-Berrocal, 2004). In this regard, the findings relating to gender are especially striking: when women with greater emotional attention and lower repair of their own emotions display greater depressive symptoms, these are greater than those of men with high levels of depression (Thayler et al., 2003, as cited in Extremera & Fernández-Berrocal, 2005). Similarly, the literature identifies a deficiency in EI depending on age in adolescence. In this sense, Salguero et al. (2010) identified the ages of 16 to 17 as the stage of adolescence in which levels of emotional attention increase most.

Ultimately, it is important to achieve a good level of emotional clarity and repair to achieve this equilibrium in the three factors of EI in adolescence. This aspect is especially relevant when considering the gender perspective, as women per se tend to score higher than men in attention to feelings (Fernández-Berrocal et al., 1998; Pena et al., 2011, and Thayler et al., 2003, as cited in Extremera & Fernández-Berrocal, 2005).

1.3. Emotional intelligence and music

Royal Decree 217/2022 of 29 March, regulating the Organisation and Minimum Content of Obligatory Secondary Education in Spain states that music, as well as being a means of expressing emotions, actively contributes to their development, improving individuals' sensitivity and emotional control. So, it is in this educational context that musical activity can play a unique role thanks to its natural implications for the emotional sphere.

Learning music has the capacity to improve psychological well-being, favouring adolescents' positive emotions and minimising their negative ones, as negative emotions (such as fear, irritation, anger, boredom, or anxiety) are not usually experienced when listening to music (Blasco & Calatrava, 2020). Music enhances the acquisition of emotional competences, which focus on the interaction between the person and the environment. Hence, they have an impact both on some immediate educational applications (Campayo & Cabedo, 2016) and on emotional regulation (Saarikallio, 2011), which is an essential component of EI.

Identifying emotions in musical performance is regarded as an aspect of EI (Resnicow et al., 2004). Also, whether in a group or individually, instrumental practice increases intrapersonal skills and favours control of emotions (Campayo-Muñoz & Cabedo-Mas, 2017). Even Bisquerra (2015) has attributed a purely emotional aim to music. And its effect is not one-way as there is a positive mutual correspondence between music and emotional skills, meaning that through their beneficial effects, the two areas mutually reinforce one another (Campayo & Cabedo, 2016; Bonastre & Nuevo, 2020). Consequently, music training has a positive influence on intrapersonal and interpersonal competences alike, and on improving academic performance in general (Barrientos et al., 2019).

In this sense, it is important to distinguish between two types of musical training: active and receptive. Active musical training, that is, when a person learns and makes music (Benítez et al., 2017), is a more complex phenomenon in cognitive terms and more significant from an educational perspective (Rauscher & Hinton, 2006). Although other musical experiences provoke and evoke an individual's emotions, music lessons also affect cognitive performance and capacity (Rauscher & Hinton, 2006); they favour conative skills, including self-concept and personality variables (Degé et al., 2014); and they act on EI and education through intra and interpersonal competences. All this comes together in an improvement in general academic performance (Barrientos et al., 2019). Ultimately, playing a musical instrument leads to a transfer of learning, that is to say, an improvement of skills in various extra-musical areas (Benítez et al., 2017).

The psychology of music has confirmed that playing music requires the emotional brain, which also affects other areas of the brain. This makes it work holistically, causing a series of specific neuronal connections de-

fined as "engrams" or fingerprints, which are real and characteristic of this activity, and that are not achieved through others (Lacárcel, 2003).

Nonetheless, all of this evidence in favour of musical training does not seem sufficient. Such is the need to make learning outcomes in education visible and quantify them that the imprecision of measurement of the aesthetic experiences that music and its methodology offer hampers its standing (Chao-Fernández et al., 2020).

Notwithstanding, researchers' efforts to find quantifiable results in the field of music are bearing fruit. Many of them transcend the educational sphere and relate to the requirements of Spain's Organic Act 3/2020, of 29 December, which amends Organic Education Act 2/2006, of 3 May (LOMLOE). However, for students to achieve these emotional competences well through music, musical training should have its own space in the curriculum, with the status of a central subject. This increased presence should, of course, be accompanied by a more consistent initial training of specialist music teachers.

2. Objective and hypothesis

The main purpose of this article is to measure adolescents' EI according to the *age*, *gender*, and *musical studies* variables. The following specific objectives were set: to explore levels of EI in a group of adolescents by age and gender, to compare the EI scores obtained by young musicians and non-musicians and to explore the effect of musical praxis on the EI of adolescent musicians by gender. In line with all of this, we formulated the following hypotheses:

1. There are differences in EI by the age and gender of the adolescents.

2. Young people who pursue professional education in a conservatory will have different EI scores than those who have never received regulated musical training.

3. The relationship between musical praxis and EI in adolescents is not affected by gender.

The ultimate aim of the present study was to establish whether young musicians have different EI scores than non-musicians and whether *gender* as a variable affects music's impact on adolescents.

3. Method

3.1. Population and sample

To guarantee the homogeneity of the sample, private educational centres classed as elitist were rejected from the start, as were centres classified as special educational support centres (Centros de Acción Educativa Singular [CAES]) for children with challenging home circumstances or very low-income households. The second selection criterion was that the centres be in places with socio-economic and cultural levels as similar as possible to those of the music conservatories. The following centres in the city of Valencia (Valencian Community, Spain) were finally selected:

- IES San Vicente Ferrer, located in L'Eixample.

- Colegio Salesiano San Antonio Abad, located in Morvedre, in the district of Zaidía, in the Sant Antoni neighbourhood.

- Colegio Mantellate, located in Llano de la Zaidía.

Of the three collaborating educational centres, one is publicly owned and the other two are state-funded independent schools.

The collaborating music conservatories are located in the city of Valencia and in Torrente, respectively. Both offer basic and professional studies in music, they are publicly owned, and they are managed by Valencia's regional government (the Generalidad Valenciana). Specifically, the following conservatories were selected:

- The Velluters professional music conservatory from Valencia, located in the centre of the city, in the district called Ciutat Vella.

- The Torrent professional music conservatory (CPMT), located in the metropolitan area of Valencia.

The initial study sample comprised a total of 538 subjects, of which 129 were eliminated from the analysis as they did not fulfil the inclusion criteria. This left 409 participants. We performed the descriptive analyses of the sample on these 409 ESO students residing in Valencia, who were between 11 and16 years of age (M = 13.86; SD = 1.222). Specifically, 205 were female and aged between 12 and 16 years (M = 13.96; SD = 1.206), while 204 were male and aged between 11 and 16 years (M = 13.76; SD = 1.233).

3.2. Variables and tools

Sociodemographic data. We used the ad hoc sociodemographic questionnaire to obtain quantitative and qualitative data to enable us to define the different categories and groups in the sample. This tool included 21 items that collected sociodemographic data, academic data, and musical habits. It was structured in two blocks of questions: one designed to gather sociodemographic data such as age, gender, and place of birth and residence; and another for academic data such as level of musical studies, time spent on these studies, age at which they started to study music and in what educational context, level of regulated studies, and future academic prospects.

Musical training. Two categories of subjects in the group were identified: *musicians* (those who were pursuing professional education studies in music conservatories) and *non-musicians* (those who were not pursuing these studies). These, in turn, were organised into four subgroups considering the type of music training they received, and how long they had been playing a musical instrument. Based on the definition of *musician* proposed by Zhang et al. (2020), the group of musicians comprised the young people who had had contact with music for at least six years. Afterwards, the following subgroups were delineated: *musicians with more than six years of training, musicians with less than six years of training, music at school only* (they have only studied music at school), *no music* (they have never studied music).

Emotional intelligence. In the analysis of EI, we used the Trait Meta-Mood Scale (TMMS-24), which measures intrapersonal intelligence in three dimensions: attention to one's own feelings, emotional clarity, and repair of one's own emotions, which would entail a valuation of EI by means of self-report (Extremera & Fernández-Berrocal, 2004).

Through their items, the different factors or dimensions of EI are explored:

- *Attention* (eight items): from 1 to 8.
- *Clarity* (eight items): from 9 to 16
- *Repair* (eight items): from 17 to 24

This test establishes different cut-scores in the assessment of EI for each gender (male–female).

3.3. Data collection procedure

After requesting and receiving the relevant permissions, the data collection was done in a single moment of time using the double-blind procedure. The subjects were identified with alphanumeric codes determined by the year group, class, and ID assigned to each subject. Consequently, the researchers did not have access to the participants' personal data and the centres could not access the results. The measurement of EI was done following the indications of the authors of the TMMS-24 questionnaire.

In one of the participating centres, the tool was administered online at the request of the centre; in the others, it was administered on paper. In light of this situation, all necessary analyses were performed to establish whether there were differences between formats that affected the results. As there were not, both were accepted for the research. The paper questionnaires were dispensed in groups, in morning classes and in the classrooms themselves. They were administered simultaneously to each class group in a time band of 35 to 40 minutes, allowing the collection of data in a single session for each of the class groups. The online format contained the same number of items, with the same scales and answer options and it was administered by means of Google Forms, with the students completing it individually at home, outside school hours.

3.4. Data analysis

Having made the necessary checks, we processed the data. We did the calculations using probabilistic sampling, meaning that all of the participants had the same random chance of forming part of the analyses. We used IBM SPSS 26.0 for all of the statistical analyses, taking $p < 0.05$ as the significance level.

The TMMS-24 test measured perceived EI according to three different dimensions: *attention*, *clarity*, and *repair*. Due to their interdependence, we analysed outliers using the Mahalanobis procedure, resulting in the elimination of one participant (male, aged 12, non-musician) from the final sample. Furthermore, a total of thirteen participants with missing data were detected and were eliminated from the TMMS-24 analysis.

To describe the sample, we used descriptive statistics for continuous variables such as age, age when starting music, and number of hours of practice of the musical instrument (mean and standard deviation); as well as frequencies (number and percentage) for the interval, ordinal, or dichotomous variables (gender, country of birth, current and previous instrument, place where musical

instrument is practised, etc.). We used Student's *t* test to compare the means of male and female respondents, *musicians* and *non-musicians* groups, and the *musicians* subgroups (*musician >6 years* and *musician <6 years*) and *non-musicians* subgroups (*music at school only* and *no music*) by age and age at the start of their relationship with music. We also used the chi-squared test to evaluate the absence of differences by distribution of males and females in the different groups of *musicians* and *non-musicians*, as well as in the subgroups. Furthermore, we used single-variant ANOVA to investigate the differences between subgroups of *musicians* and *non-musicians* (between-subjects factor) in age and age at the start of music.

We analysed gender differences in EI (TMMS-24) using Student's *t* test for independent samples in the three dimensions: *attention*, *clarity*, and *repair*. Furthermore, we used the Pearson correlation to examine the relationship between these three dimensions and with age.

Additionally, we used a multivariate ANOVA with the *group* variable (categories: (i) *musician* and (ii) *non-musician*) and gender variable (categories: (i) *male* and (ii) *female*) as inter-subject variables to establish the differences in the three dimensions of emotional intelligence (*attention*, *clarity*, and *repair*) between the musicians and non-musicians groups, considering gender.

We used the Bonferroni test in the post hoc analyses. To analyse the subgroups of *musicians* (*musician >6 years* and *musician <6 years*) and *non-musicians* (*music at school only* and *no music*) and their relationship with the dimensions of EI (*attention*, *clarity*, and *repair*) considering gender, we performed a multivariate ANOVA with the group variable (categories: (i) *musician >6 years*, (ii) *musician <6 years*, (iii) *music at school only*, and (iv) *no music*) and gender variable (categories: (i) *male* and (ii) *female*) as inter-subject variables and the dimensions of EI (*attention*, *clarity*, and *repair*) as intra-subject variables.

4. Results

The results of the preliminary analyses were as follows: the independent samples *t* test did not show significant differences by age between the *musicians* and groups (t_{407} = 0.620, p = 0.536). The female respondents from this sample started studying music aged between 3 and 15 (M = 8.71, SD = 2.551), while the male respondents started aged between 2 and 16 (M = 8.17, SD = 2.477). In other words, we found no differences by age or by age at start of music between male and female respondents (all p >0.005).

Regarding the subgroups of *musicians* (*musician <6 years* and *musician >6 years*) and of n*on-musicians* (*music at school only* and *no music*), the ANOVA showed significant differences by age ($F_{3, 405}$ = 74.881, p <0.001). Musicians with more than six years of regulated training in music were older than musicians with less than six years of training and non-musicians who only receive training in school (all p <0.001). In contrast, the respondents who did not receive any music education were older than the musicians with more than six years of training (p = 0.001).

Furthermore, the ANOVA also showed significant differences in the age of starting music education between musicians with more than six years of training, musicians with less than six years of training and those who had only received music training at school ($F_{3, 335}$ = 76.120, p <0.001).

We found no significant differences in the distribution of boys and girls between the groups of *musicians* and *non-musicians* (χ^2_3 = 2.946, p = 0.400), indicating an even gender distribution in all of the groups, as Table 1 shows.

TABLE 1. Distribution of sample by music training received and gender.

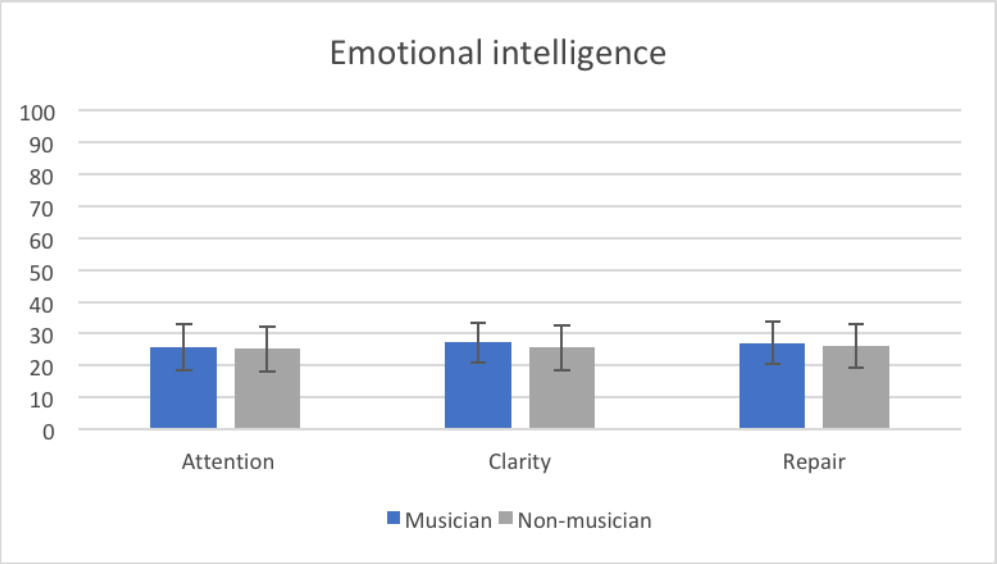
	Musician		**Non-musician**		**Total**
Gender *n* (%)	>6 years	<6 years	Music at school only	No music	
Female	43 (53.1)	33 (50.8)	90 (46.2)	39 (57.4)	205 (50.1)
Male	38 (46.9)	32 (49.2)	105 (53.8)	29 (42.6)	204 (49.9)
Total (*n*)	81	65	195	68	409

4.1. Relationship between EI and the *musician*, *age*, and *gender* variables

The analyses performed showed a difference by gender the dimension of *attention* (t_{393} = 5.362, p <0.001), with girls scoring higher than boys. However, differences by gender were not apparent in the *clarity* and repair dimensions (both p >0.149). We also observed a positive correlation between age and the dimension of *attention* (r = 0.108, p = 0.031), with higher *attention* scores being apparent at higher ages. On the contrary, we found no significant correlations between age and the dimensions of *clarity* or *repair* (all p >0.239). Ultimately, the dimensions of *attention*, *clarity*, and *repair* were found to be positively related to one another (all p <0.001).

The multivariate ANOVA with the *group* variable (categories: (i) *musician* and (ii) *non-musician*) and *gender* variable (categories: (i) *male* and (ii) *female*) as inter-subject variables displayed a significant effect of the group variable (*musician-non-musician*) in the *clarity* dimension ($F_{1, 391}$ = 5.566, p = 0.019), but this effect was not significant in the attention or *repair* dimensions (all p >0.370). The post hoc analyses displayed higher clarity scores in the musicians group than in non-musicians. Furthermore, a significant effect of the gender variable ($F_{1, 391}$ = 5.566, p = 0.019) was observed in the attention dimension, but not in clarity or repair (all p >0.293). The post hoc analyses showed higher levels of attention in girls than in boys (p <0.001). The *group*gender* interaction was not significant for any dimension (p >0.184 in all cases). Figure 1 shows the differences in EI scores between the *musicians* and *non-musicians* groups of adolescents.

FIGURE 1. Emotional intelligence between musicians and non-musicians.

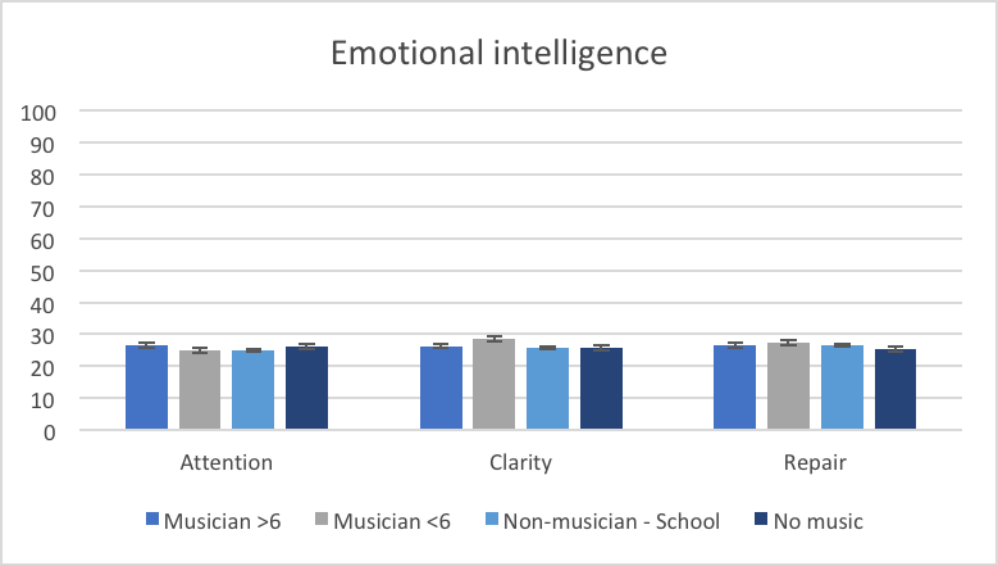


After a detailed analysis of the results considering the subgroups of *musicians* (*musician >6 years* and *musician <6 years*) and *non-musicians* (*music at school only* and *no music*), the multivariate ANOVA with its group variable (categories: (i) *musician >6 years*, (ii) *musician <6 years*, (iii) *music at school only*, and (iv) no music) and gender variable (categories: (i) *male* and (ii) *female*) continued to show the significant effect of the *group* variable in the *clarity* dimension ($F_{3, 387}$ = 3.064, p = 0.028). However, this group effect was not significant in the *attention* or *repair* dimensions (all p >0.315).

The post hoc analyses showed that there were no differences between the group of *musicians >6 years* and the other groups (all p >0.516) in the *clarity* dimension. Nonetheless, the group of *musicians <6 years* displayed higher clarity scores than the *music at school only group* (p = 0.022), but not in comparison with the *no music* group (p = 0.101).

Furthermore, we observed a significant effect in the *gender* variable in the *attention* dimension ($F_{1, 387}$ = 22.914, p <0.001) but not in the *clarity* and *repair* dimensions (all p >0.458). The post hoc analyses showed higher levels of *attention* in girls than in boys (p <0.001). The *group*gender* interaction was not significant for any dimension (p >0.196 in all cases). This shows that the relationship between music training and TMMS-24 is not modulated by gender. Figure 2 shows the differences in EI scores between the subcategories of *musicians* and *non-musicians*.

FIGURE 2. Emotional intelligence between subgroups of musicians and non-musicians.



5. Discussion

The hypotheses confirmed in this research state that there are differences in EI in adolescence depending on whether individuals are male or female and on their ages; that young people who are pursuing professional studies at a conservatory have different EI scores than those who have never received this teaching; and that the effect of musical praxis on adolescents is not affected by whether they are male or female.

Previous studies have considered differences in EI between young people by age and gender, as well as the need to implement programmes to develop this psychological variable in the educational sphere. However, there is a lack of research that analyses and compares EI between young musicians and non-musicians, or the effect of this artistic practice on students by gender. Thus, in this work, the three dimensions of intrapersonal EI have been examined with all of the sample, by age and gender, using TMMS-24. Furthermore, the impact of all of these variables on the various subcategories of *musicians* and *non-musicians* has been explored. All of this is discussed below.

5.1. Relationship between emotional intelligence and the age and gender variables

The present work finds a positive correlation between age and emotional attention in all of the sample, with emotional attention scores increasing with age. Furthermore, it detects significant differences by gender, with females having higher levels of attention than males. Agreeing with the studies analysed above, adolescents tend to pay more attention to their emotions as they get further into this developmental stage (Salguero et al., 2010), especially females (Thayler et al., 2003, as cited in Extremera & Fernández-Berrocal, 2005).

Given that the imbalance between the dimensions that comprise EI can have very negative repercussions for people and, considering the risks inherent in achieving high levels in emotional *attention*, it is necessary to implement actions that especially reinforce *clarity* and emotional *repair* in young people. As previously noted, high levels of attention and low levels of clarity and emotional repair can result in emotional maladjustment and cause symptoms of anxiety, depression, and stress (Delhom et al., 2023; Extremera & Fernández-Berrocal, 2005); especially in the stage of adolescence, a period in which emotional attention is significantly affected by age and gender.

5.2. Relationship between EI and the music variable

The present study has found differences in the three dimensions of EI, achieving significance in emotional *clarity*, and displaying a trend towards greater emotional *repair* in the group of *musicians*.

It should be noted that emotional *clarity* is an important dimension in the process of emotional regulation, as people cannot manage or effectively repair their emotions without first being able to identify them. Consequently, emotional *clarity* is regarded as a key factor in the functional sequence that characterises the process of emotional regulation (Extremera & Fernández-Berrocal, 2005). So, musical praxis can positively affect the EI of the subjects and have a positive effect on their emotional regulation.

Although there is a gap in studies that compare EI between adolescent musicians and non-musicians (Campayo-Muñoz & Cabedo-Mas, 2017), some research works carried out with groups of musicians provide interesting findings that are in line with those found in this research. In this regard, Barrientos et al. (2019) showed that adolescents who play a musical instrument stand out in intrapersonal EI. This gives them a good capacity to reflect on themselves and good self-awareness of their own emotional life, favouring a greater capacity for self-realisation and a good level of autonomy and of assertiveness with others. In this sense, Chao et al. (2015) detected in adolescents an improvement in conative, behavioural, emotional, and social aspects that can be attributed to studying music.

In any case, the study of psycho-emotional aspects in the group of young musicians compared with their non-musician counterparts is a broad field that is yet to be explored.

6. Conclusions

We should firstly note that hypothesis one of this research is fulfilled, agreeing with previous studies. In the sample as a whole, girls displayed significantly better emotional attention than boys, and they all increased their scores in this dimension as they got further into adolescence. Therefore, there are differences by age and gender in the EI of male and female adolescents.

Secondly, we should note that hypothesis two is also fulfilled, as male and female adolescent musicians who are pursuing professional music studies at conservatories display significant differences in EI compared to non-musicians. Their scores are higher in the three dimensions that comprise EI, achieving significance in emotional *clarity*. This difference is crucial because, as previous research has shown, emotional clarity could prevent emotional maladjustment, avoiding its damaging consequences, and it could also have immediate educational application, improving general academic performance. The importance of this finding lies in the fact that, by better understanding their feelings and knowing how to identify them, adolescent musicians who pursue professional studies could have greater and better emotional balance, better psychological adjustment and a large reduction in depressive behaviours, as emotional clarity is considered to be an essential element in the process of emotional regulation.

Finally, we should note that hypothesis three is also fulfilled, as the significant effect of music on the perceived EI of young people is the same in males and females.

To summarise, the present study finds differences in the EI of male and female young people depending on their age and gender, that musicians display significantly higher levels of emotional clarity than non-musicians, and that the significant effect that pursuing professional music studies at a conservatory has on the EI of male and female musicians affects individuals equally, regardless of whether they are male or female. In this developmental stage in which young people in general see their emotional competences shaped both by age and by gender, this does not seem to affect musicians as much.

Finally, taking into account the possible academic and emotional impact of studying music in the educational sphere, we turn to earlier studies that confirm that emotional competences and music reciprocally reinforce one another enabling a process of feedback of the benefits in both spheres. Therefore, in view of the evidence that music has undoubted benefits in EI, it would be beneficial to increase the presence of music in the training of teachers and students, and so train people who are emotionally better prepared for society.

The limitations of this research include its methodology, as a transversal comparative study does not allow examination of changes over time or establish causal relations between the variables analysed. Similarly, it would be interesting to expand the study with young people who study at basic and higher levels in conservatories. Finally, focussing the gender variable on the male-female duality does not explore gender to the full extent that is necessary or advisable, as cultural studies currently do, where gender is more than a category and becomes one of the levels of intersectionality with which social differences are demarcated.

As future lines of research, it would be of value to establish whether subjects' academic qualifications correspond with their levels of EI, especially in the case of musicians. Given that music affects psychological variables that directly relate to academic and personal achievement, it would be necessary to carry out a longitudinal intervention in educational centres with students who are at risk of academic failure to make it possible to determine whether studying music has a causal effect on these and other psychological variables.

Finally, this study shows that young people who study music regularly and formally show significant differences in EI compared to young people who have not studied music. This challenges the devaluation of the individual's own EI, which depends on age and gender in adolescence.

Notes:

[1] This research was done in the framework of the iMUSED (Investigating Music Education GIUV2020-483) research group of the Universidad de Valencia.

References

Barrientos, A., Arigita, A., & Sotelo, J.A. (2019). Inteligencias múltiples y rendimientos en estudiantes de un centro integrado de música [Multiple intelligences and performance in students at an integrated music school]. *Creatividad y sociedad: revista de la Asociación para la Creatividad*, (29), 5-26. http://creatividadysociedad.com/creatividad-y-emociones

Benítez, M.A., Díaz, V.M., & Justel, N.R. (2017). Beneficios del entrenamiento musical en el desarrollo infantil: una revisión sistemática [Benefits of music training in child development: A systematic review]. *Revista Internacional de Educación Musical, 5* (1), 61-69. https://doi.org/10.12967/RIEM-2017-5-p061-069

Bisquerra, R. (2015). *Psicopedagogía de las emociones [Psychopedagogy of emotions]*. Síntesis.

Blasco, J. S., & Calatrava, C. (2020). Influencia de la música en las emociones percibidas en el alumnado de educación secundaria y bachillerato [Influence of music on the emotions perceived in the students of secondary and baccalaureate education]. Espiral. *Cuadernos del profesorado, 13* (27), 180-191. http://dx.doi.org/10.25115/ecp.v13i27.2909

Bonastre, C., & Nuevo, R. (2020). Estrategias de aprendizaje sobre la expresividad musical en enseñanzas superiores e inteligencia emocional [Learning strategies on musical expression in higher education and emotional intelligence]. *Revista Internacional de Educación Musical, 8* (1), 43-51. https://doi.org/10.1177/2307484120956515

Campayo, E. A., & Cabedo, A. (2016). Música y competencias emocionales: posibles implicaciones para la mejora de la educación [Music and emotional competences: Possible implications for the improvement of education]. *Revista Electrónica Complutense de Investigación en Educación Musical - RECIEM, 13*, 124-139. http://dx.doi.org/10.5209/RECIEM.51864

Campayo-Muñoz, E. A., & Cabedo-Mas, A. (2017). The role of emotional skills in music education. *British Journal of Music Education, 34* (3), 243-258. https://doi.org/10.1017/S0265051717000067

Chao, R., Mato, M. D., & López, V. (2015). Beneficios de la música en conductas disruptivas en la adolescencia [Benefits of music in disruptive behaviours during adolescence]. *Actualidades investigativas en Educación, 15* (3), 104-127. http://dx.doi.org/10.15517/aie.v15i3.20902

Chao-Fernández, R., Pérez, M.C., & Chao-Fernández, A. (2020). Análisis de la percepción de las familias sobre la educación musical en la escuela [Analysis of the perception of families on musical education at school]. *DIGILEC: Revista Internacional de Lenguas y Culturas, 6*, 75-88. https://doi.org/10.17979/digilec.2019.6.0.5954

Degé, F., Wehrum, S., Stark, R., & Schwarzer, G. (2014). Music lessons and academic self-concept in 12-to 14-year-old children. *Musicae Scientiae, 18* (2), 203-215. https://doi.org/10.1177/1029864914523283

Del Rosal, I., Moreno-Manso, J. M., & Bermejo, M. L. (2018). Emotional intelligence and academic performance in initial training teachers in University of Extremadura. Profesorado. *Revista de curriculum y formación de profesorado, 22* (1), 257-275. http://hdl.handle.net/10662/11708

Delhom, I., Donlo-Bellegardeb, M., Mateu-Mollá, J., & Lacomba-Trejo, L. (2023). Análisis de predictores de síntomas ansiosos, depresivos y del estrés: inteligencia emocional y afrontamiento [Analysis of predictors of anxious, depressive and stress symptoms: Emotional intelligence and coping]. *Revista Psicología de la Salud, 11* (1) 48-70. https://doi.org/10.21134/pssa.v11i1.302

Extremera, N., & Fernández-Berrocal, P. (2004). El papel de la inteligencia emocional en el alumnado: evidencias empíricas [The role of students' emotional intelligence: Empirical evidence]. *REDIE. Revista Electrónica de Investigación Educativa, 6* (2), 1-17. https://redie.uabc.mx/redie/article/view/105

Extremera, N., & Fernández-Berrocal, P. (2005). Inteligencia emocional percibida y diferencias individuales en el metaconocimiento de los estados emocionales: una revisión de los estudios con el TMMS [Perceived emotional intelligence and individual differences in the meta-knowledge of emotional states: A review of the studies with the Trait Meta-Mood Scale]. *Ansiedad y estrés, 11* (2-3), 101-122. https://www.ansiedadyestres.es/ref/2005/11-101-122

Fernández-Berrocal, P., Alcaide, R., Domínguez, E., Fernández-Mcnally, C., Ramos, N. S., & Rovira, M. (1998). Adaptación al castellano de la escala rango de metaconocimiento sobre estados emocionales de Salovey et al.: datos preliminares [Spanish adaptation of the Salovey et al. meta-cognition rank scale on emotional states: Preliminary data]. En *Libro de actas del V Congreso de Evaluación Psicológica*.

Fernández-Berrocal, P., & Extremera, N. (2002). La inteligencia emocional como una habilidad esencial en la escuela [Emotional intelligence as an essential school skill]. *Revista Iberoamericana de Educación, 29* (1), 1-6. https://doi.org/10.35362/rie2912869

Fernández-Berrocal, P., & Extremera, N. (2005). La inteligencia emocional y la educación de las emociones desde el modelo de Mayer y Salovey [Emotional intelligence and emotional education from Mayer and Salovey's model]. *Revista Interuniversitaria de Formación del Profesorado, 19* (3), 63-93.

Gardner, H. (2016). *Estructuras de la mente: la teoría de las inteligencias múltiples. [Frames of mind: The theory of multiple intelligences]*. Fondo de Cultura Económica.

Hallam, S. (2010). The power of music: Its impact on the intellectual, social and personal development of children and young people. *International journal of music education, 28* (3), 269-289. https://doi.org/10.1177/0255761410370658

Iryhina, S., Sbrueva, A., Chystiakova, I., & Chernyakova, Z. (2020). Implementation of emotional intelligence theory in future musical art teachers training. *Journal of History Culture and Art Research, 9* (2), 50-60. https://doi.org/10.7596/taksad.v9i2.2575

Lacárcel, J. (2003). Psicología de la música y emoción musical [Psychology of music and musical emotion]. *Educatio siglo XXI*, (20-21), 213-226. https://revistas.um.es/educatio/article/view/138

Mayer, J., Salovey, P., Caruso, D.R., & Cherkasskiy, L. (2011). Emotional intelligence. In B. J. Sternberg, & S. B. Kaufman (Eds.), *The Cambridge handbook of intelligence* (pp. 528-549). Cambridge University Press.

Molero, C., Saiz, E., & Esteban, C. (1998). Revisión histórica del concepto de inteligencia: una aproximación a la inteligencia emocional [Historical review of the concept of intelligence: an approach to emotional intelligence]. *Revista Latinoamericana de Psicología, 30* (1), 11-30.

Pastor, J., Bermell, M. A., & González, J. (2019). Programa de educación emocional a través de la música en educación primaria [Program of emotional intelligence by means of music in primary education]. *Edetania: estudios y propuestas socioeducativos, 54*, 199-222.

Puertas-Molero, P., Zurita-Ortega, F., Chacón-Cuberos, R., Castro-Sánchez, M., Ramírez-Granizo, I., & González-Valero, G. (2020). La inteligencia emocional en el ámbito educativo: un metaanálisis [Emotional intelligence in the field of education: A meta-analysis]. *Anales de Psicología / Annals of Psychology, 36* (1), 84-91. https://doi.org/10.6018/analesps.345901

Rauscher, F. H., & Hinton, S. C. (2006). The Mozart effect: Music listening is not music instruction. *Educational Psychologist, 41* (4), 233-238. https://doi.org/10.1207/s15326985ep4104_3

Resnicow, J. E., Salovey, P. y Repp, B. (2004). Is recognition of emotion in music performance an aspect of emotional intelligence? *Music Perception, 22* (1),145-158. https://doi.org/10.1525/mp.2004.22.1.145

Saarikallio, S. (2011). Music as emotional self-regulations through adulthood. *Psychology of Music, 39* (3), 307-327. https://doi.org/10.1177/0305735610374

Salguero, J. M., Fernández-Berrocal, P., Balluerka, N., & Aritzeta, A. (2010). Measuring perceived emotional intelligence in the adolescent population: Psychometric properties of the Trait Meta-Mood Scale. *Social Behavior and Personality: An international journal, 38* (9), 1197-1209. https://doi.org/10.2224/sbp.2010.38.9.1197

Thorndike, R. L. (1920). Intelligence and its uses. *Harper's Magazine, 140*, 227-235.

Zhang, J. D., Susino, M., McPherson, G. E., & Schubert, E. (2020). The definition of a musician in music psychology: A literature review and the six-year rule. *Psychology of Music, 48* (3), 389-409. https://doi.org/10.1177/0305735618804038

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Instrumental practice to shape character: Educational possibilities from a perspective of musical craftsmanship

La práctica instrumental para formar el carácter: posibilidades educativas desde una perspectiva artesanal de la música

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Abstract:

Music has been present in education for centuries, expressed differently in societies in different times and places, among which it is worth mentioning Classical Greece. Some of its philosophers and pedagogues emphasised the positive effect of musical education on human character. The objective of this article is to demonstrate the educational potential of music, as well as the relationship that exists between learning to play an instrument and character education. Based on the analysis of two key works from the Aristotelian corpus, the *Politics* and the *Nicomachean Ethics*, a viable virtue ethic can be created that focuses on craftsmanship. The idea of the craftsman proposed by Richard Sennett provides a guide for finding a method for musical practice where instrumental proficiency is at the heart of learning and the educational process. This shows how music education, in general, and learning an instrument, in particular, share a goal with character education: the comprehensive education of human beings. Learning music has the capacity to influence character by creating and reinforcing habits and virtues with a view to excellence and human flourishing. Through a concept of music practice based on craftsmanship, music and education can be used to influence the individual positively. In this way, certain practices and behaviours present in the Western tradition of music education can be redirected. Despite the fact that there are numerous ways to experience music, instrumental practice is recommended as the main one given the organological condition of music. As Aristotle's practical philosophy emphasises *praxis* and music is essentially a human activity, it can be concluded that music education using instrumental practice has an influence on the multiple dimensions of an individual's education and in constructing a community that shares the ultimate goal: flourishing.

Keywords: character education, music education, specialised instrumental practice, virtue, craftsman.

Resumen:

La música ha estado presente en la educación desde hace siglos, con expresiones diversas en sociedades de distintos tiempos y espacios, de entre las que sobresale la Grecia clásica. Algunos de sus filósofos y pedagogos destacaron la repercusión positiva que la formación musical tiene sobre el carácter humano. El objetivo de este artículo es mostrar el potencial educativo de la música, además de la relación existente entre la formación instrumental y la educación del carácter. A partir del análisis de dos obras clave del corpus aristotélico, la *Política* y la *Ética a Nicómaco*, se elabora una posible ética de la virtud centrada en la artesanía. La idea del artesano propuesta por Richard Sennett sirve de guía para encontrar un modo de práctica musical en el que el dominio instrumental sea el núcleo del aprendizaje y del proceso educativo. Se muestra cómo la educación musical, en general, y la formación instrumental, en particular, comparten un fin con la educación del carácter: la formación integral del ser humano. El aprendizaje musical tiene la capacidad de incidir en el carácter y crear y reforzar hábitos y virtudes con vistas a la excelencia y al florecimiento humano. Por medio de una concepción artesanal de la práctica musical, la música y la educación se pueden cruzarse para incidir de forma positiva en el individuo. De este modo, es posible reorientar ciertas prácticas y conductas de la formación musical presentes en

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la tradición occidental. A pesar de que existen multitud de modos de experimentar la música, la práctica instrumental es considerada la principal por la condición organológica de la música. Puesto que la filosofía práctica de Aristóteles incide en la *praxis* y que la música es, en esencia, una actividad humana, se puede concluir que la educación musical a través de la práctica instrumental incide en la formación de las múltiples dimensiones del individuo y en la construcción de una comunidad que comparta un fin último: el florecimiento.

Palabras clave: educación del carácter, educación musical, práctica instrumental especializada, virtud, artesano.

1. Introduction

The following statement is by the philosopher and pedagogue John Dewey (2014): "No one can escape them if he wants to. He cannot escape the problem of how to engage in life, since in any case he must engage in it in some way or other— or else quit and get out" (p. 95). Music is an essential part of a human being's life and how we engage with it can determine the course of our lives. Thus, music education has a commitment to educating human beings as such and transforming society (Jorgensen, 2003).

In this respect, Fernández and Casas (2019) present the confusion and lack of consensus surrounding the word *education* in the context of music teaching. They reach the conclusion that it is not possible to discuss education without including moral components that explain the *why* and the *what for*, as it constitutes an ethical activity. Along these lines, we find Aróstegui (2011), who describes educational music as a moral and political activity; or Bowman (2012), who insists that making music can be a way to reflect on the sort of *good person that I can be* and that music can help with this.

Nevertheless, in music education in Spain, Touriñán and Longueira (2010) make the distinction between education *for* music, located in conservatories or music schools with the aim of professionalisation, mainly involving instrumental specialities; and education *through* music, belonging to the context of general education. In this case, "as an educational area, music helps each learner to use and form valuable experience for their own lives and comprehensive education, based on their musical, artistic experience (Touriñán & Longueira, 2010, p. 157).

In consideration of the above, this article aims to analyse the educational possibilities of specialised instrumental practice. To this effect, it will propose an ethical and practical structure, originating in the concept of character education and focusing on the notion of craftsmanship, and will reflect on the educational repercussions of this approach.

2. Character education: An Aristotelian approach to the educational needs of today

Defining character education (CE) is a complex task (Berkowitz & Bier, 2005). It is an *umbrella* term which encompasses a great number of initiatives, such as virtue education, values education or citizenship education (Bernal et al., 2015; Fuentes, 2018). Duckworth and Meindl (2018) even question the relevance of defining it, as this involves excessive reductionism and a simplification of its scope. Although they claim that it is preferable to target educational action intentionally and deliberately, they do not consider that it needs to be structured and limited to the school. For these reasons, it is also complicated to establish a definition that is valid for all contexts (Lickona, 2018).

However, in short, this way of understanding education could be summarised as "knowing the good, desiring the good, and doing the good" (Lickona, 1999, p. 140). CE aims for the community *ethos* to commit to a series of moral values, virtues and ethical conduct that everyone observes for the common good. The educational community is fully involved and educators play a crucial role in developing virtuous character (Berkowitz & Bier, 2005), in that the teacher figure should set a moral example through their actions, both in and out of the classroom (McGrath, 2018). Thus, the community and its care are of the utmost importance and, therefore, individual responsibility is required to support a common good (The Jubilee Centre for Character and Virtues, 2017; Lickona, 1999).

Furthermore, the traits that define the current view of CE are ethical aspects that derive from Aristotle's philosophy (Kristjànsson, 2015), from which different

concepts and fundamental meanings stem, such as character, virtue, prudence, happiness or flourishing (Vargas & González-Torres, 2009). In this manner, from an Aristotelian perspective, it can be claimed that human activity tends to seek a purpose that is in keeping with its nature, the ultimate good (Höffe, 2008). It is "an activity of the soul in accordance with virtue, or if there are several virtues, in accordance with the best and most perfect kind, and, moreover, in a complete life" (Aristotle, 2010, p. 36). This ultimate good goes beyond an individual's life when they accept that it is inseparable from the common good; according to the Stagirite, the ultimate good "is more beautiful and divine when it is secured for a nation and cities" (Aristotle, 2010, p. 25).

But what is this higher good that is stable and enduring throughout life? *Eudaimonia.* MacIntyre (1987) defines it as bliss, happiness, prosperity, delight in human life, and Barnes (1999) identifies it as a process, that of flourishing, "making a success of our own lives" (p. 130). This process is renewed through virtues and is supported by the concept of good embraced by the individual and their community. This approach is distinguished by excellence, by doing what will produce pleasure through its sublime degree of goodness (Barnes, 1999; MacIntyre, 1987). In conclusion, the highest good is not a possession, but rather a way of life: "the happy man lives well and does well" (Aristotle, 2010, p. 37).

Moreover, character is composed of numerous, interdependent virtues that serve the individual and the common good. Virtue, or *arete*, for Aristotle, holds a similar meaning to that of *goodness* or *excellence* (Barnes, 1999). They are positive and stable habits that improve meaning and the perception of who one is and who one can become (McGrath, 2018). Sanderse (2015) describes virtuous life as a type of self-sufficient life in which habit acquires a normative dimension. However, as a habit, the virtue ethic could be limited to a mechanistic view (Jiménez, 2016); so, for this reason, the regulatory meta-virtue of prudence *(phronesis)* is decisive (Burbules, 2019). In this way, virtues are dispositions and ways of behaving that allow the individual to reach *eudaimonia*, which requires judgement to decide on the means "in the right place, at the right time and in the right way" (MacIntyre, 1987, p. 190).

Therefore, the forming of good character is understood to be a type of comprehensive human development, a condition it shares with modern music education (Fernández & Casas, 2019; Castro, 2014; Cuscó, 2013; Touriñán & Longueira, 2010; Jorquera, 2006; Vilar, 2004). It involves learning to live in a community for a shared ultimate good, based on individual activity guided by reason and prudence. The question that arises from the above is whether the teaching of specialised instrumental practice can adopt these ethical principles and how it could do so.

3. Proposal for an ethic of praxis regarding specialised instrumental practice

As has been shown, Aristotle's ethics is essential for the development of CE and, at the same time, it is compatible with music education. Nevertheless, it is necessary to clarify how specialised instrumental practice may acquire educational status. For this reason, in the following section, the focus will be on an ethical, practical view of the connections between character and practising an instrument. Along with this analysis, there will be a reflection on the situation of music in Aristotelian times and the present. The section will conclude with a proposal for a code of ethics focusing on Richard Sennett's idea of craftsmanship, applicable to instrumental practice and which may serve as a guide in the musical teaching/learning process.

3.1. How music affects character: A discussion between the Aristotelian view and the current situation of music

Aristotle, in book VIII of *Politics*, analyses music from three dimensions: as a game or relaxation, as leisure or a means to virtue (in that it helps education to form character). The philosopher claims that "music instils character with certain qualities, accustoming them to enjoying themselves in a proper way" (Aristotle, 2015, p. 464). This custom or habit looks to the future, to adulthood, considering that music as leisure is among the most noble activities. In other words, it brings free men (citizens) closer to the ultimate goal of being human: *eudaimonia.* He also mentions different types of melodies, rhythms and instruments that would be suitable for influencing good character. Nonetheless, the most important aspect for this research is that, according to the Greek, students should learn music by playing it. Aristotle (2015) stated that it is not beneath the free man to do things for himself or for friends or with a view to excellence" (p. 458). Manual activity is acceptable if it is for the purpose of leisure and virtue, "as it is difficult or impossible to become good judges without participating in these activities" (p. 470).

The Stagirite's words pose a semantic problem and, ultimately, one that is ontological, which music is still

affected by as a phenomenon that occurs in almost all cultures over time and space. As Cook indicates (2001), "*music* is a very small word to encompass something that takes as many forms as there are cultural or subcultural identities. […] When we speak of music we are really talking about a multiplicity of activities and experiences" (p. 21).

Apart from this persistent problem, there are some crucial differences compared to Ancient Greece concerning the relationship that people now have with music. The technology developed since the twentieth century has endowed music with the gift of ubiquity and allows any individual to consume it wherever and whenever they wish. Until just over a century ago it was inconceivable that music could be chosen and played without the need for other people to perform it live (Matthews, 2020). Mobile digital devices and internet, with streaming or social media, have encouraged a consumption that is increasingly adapted to each person, as it is atomised and adjusted to their *preferences*, leading to *infinite personalised opportunities* to experience music (Surós, 2020). In consequence, people are less and less engaged in the process of creating music.

Harold (2016) also sheds light on the idea that in Aristotelian Greece music was contemporary in the widest sense of the word. It was a product of its time and culture (historical time) and it was created in the moment, live (subjective time). Therefore, not only was the sound dimension shared collectively but also the visual, social (rituals, leisure,) material or linguistic dimensions, for example. These days, space, time and meanings have become blurred and, above all, they are not simultaneously shared in physical reality.

Furthermore, ethics did not deal exclusively with a moral project, but rather one's way of life, as Harold (2016) himself explains. Ethics included customs such as gestures, forms of expression, knowledge of governance or leisure practices. Thus, emotional, ethical/moral and political components all held the same meaning in the community, they were part of a common project, music included (García, 2013). Consequently, music was considered good in ethical terms if it contributed to this culture of virtue. In view of the social fragmentation and specialisation evident in modern societies, it is almost impossible for every citizen to share the same single cosmovision as they did in the times of Aristotle.

Despite the foregoing, there is a fundamental idea that has remained intact over time. According to Aristotelian thought, music has a multimodal effect on the human being and a positive influence on character development from the perspective of emotions and habits (Zagal, 2019; Estrela, 2018; Suñol, 2018; García, 2013). Bearing in mind that good character cannot be established if it is not through acquiring good habits (Suñol, 2021; Harold, 2016), this brings us to a point where learning to practise an instrument plays a significant role in education.

In this respect, Dewey (2014) emphasises that habits are not exclusively mechanical nor are they separate from the person, but rather they are one's own will, they are subject to the individual's desires and tastes. In his opinion, will is associated with action, movement and change, it drives us to act: "the right disposition will produce the right deed" (p. 59). Continuing with Dewey's ideas, customs are habits that involve social conditions, habits that last over time and transcend the individual. In this sense, intelligent habits are effective in combatting a certain social inactivity that customs have produced. The expression of reason, reflection, criticism or *phronesis* can confront stifling customs in a way that is flexible and open to change, providing a glimpse of a better future.

This could be one of the ways to achieve the social transformation that, for example, critical music education intentionally seeks (Marín-Liébana et al., 2021), and which can also include specialised instrumental practice. In summary, the development of good character may be achieved through learning an instrument, with an impact both at an individual and social level, by means of active, thoughtful and critical participation in the creative processes.

3.2. Craftsmanship as the guiding principle for musical endeavours: Ethics for specialised instrumental practice

It has been shown that learning an instrument is pertinent to building character and that specialised instrumental practice can lead to personal and collective development. However, there has been criticism for decades now about the teaching method used in music conservatories (specialist, professional, formal teaching). The reason is that it focuses on technical expertise that is based on theoretical subjects far removed from practice, where the repertoire list is sacred, all of which stems from a tradition rooted in reading and writing and from a fixation with the past that impeded social change (Fernández & Casas, 2019; Casas-Mas, 2016;

Hemsy, 2011; Touriñán & Longueira, 2010; Pozo et al., 2008; Jorquera, 2006; Small, 1989).

To that effect, an alternative can be proposed regarding how to behave as a musician, and as a teacher, that may be beneficial to those engaged in the teaching/learning process in relation to music and mastery of an instrument. It involves the *ethics of doing*, based on craftsmanship and founded on virtue, a code which guides specialised instrumental practice like an educational process.

Both in music and other areas of life, confrontation persists between art and technique. There is no reason for the conflict; the combination of both areas goes back to the Greek word *tekné*, which, in a way, encompasses the meanings of different terms (technology, art, craftsmanship) and involves activities which originally had in common the use of the body to perform them (Mumford, 2014). Sennett (2021) mentions the dichotomies that have been created throughout history: theory-practice, technique-expression, artist-craftsman… And he explains that "there is nothing inevitable about acquiring a skill, just as there is nothing thoughtlessly mechanical about technique itself" (p. 21). Moreover, the primary goal with reference to music teaching would be to maintain the balance of power between the objectivity of technique and the subjectivity of human activity (art, praxis).

The guiding principle of craftsmanship is the desire to do the job well for the simple fact of doing it well, a concept of quality that is closely related to virtue, excellence, or *arete* (Sennett, 2021). This is intrinsic motivation that needs to be aroused in those who are beginning to practice an instrument, with a view to activating and consolidating certain virtues, primarily *commitment*. It concentrates on the obligation that one sets oneself regarding playing music, on assuming the responsibility for the possible effects produced by practicing. This can take one of three directions depending on those involved: commitment to the sound material (as a musician), to the learning process (as a student) and to the teaching method (as a teacher). The consequences of this link to the activity lead to satisfaction arising from the action of doing something well and give the practice meaning (Lochmann, 2020).

Commitment, combined with striving for excellence, results in another essential virtue, *care*. This concerns care for the material aspect, whether it is the sound or the people that the action is aimed at, and the result. That is to say, the care taken throughout the whole process of choosing the necessary means to achieve the desired excellence. Since craftsmanship is a process of investigation, as is musical interpretation, this idea of care merges with two other virtues: curiosity and patience. These are decisive in striving to do things well for their own sake.

In fact, one of the characteristics of craftsmanship that is highly significant in educational terms is controlling the process. Operations requiring craftsmanship are controlled at all times by the actual operator (Sennett, 2021). The time taken is that which the craftsperson/musician needs. They follow the dictates of their body, its movements and its rhythm, tiredness, reflection about the material, the particular use of their tools. More time is spent on what is truly important, a time that is lived, "a great satisfaction and a support of personal dignity" (Mumford, 2014, p. 100). In this way, students should become aware of their learning, of how their bodies respond, of how to apply the knowledge that they have acquired. However, above all, as far as teachers are concerned, they should care for their students' special characteristics whilst remaining committed in their attitude towards these learners.

The craftsperson's relationship with their artisanal experience is based on the physical, the relational, the incomplete, the difficult, the experimental, hard work and healthy failure. These experiences lead to the creation of habits that are exclusive to craftsmanship. This involves a tacit knowledge that comes from the direct relationship with the materials, motivated by curiosity and the craftsman's dialogue with them (Sennet, 2021). In this sense, the craftsman/musician "should embrace his own imperfection […] [and] preference should be shown towards what one is capable of doing by oneself, what is limited and specific and, therefore, what is human" (Sennett, 2021, p. 133). This means humbly accepting one's personal limitations whilst making the most of the opportunities provided by musical experiences to grow, in both musical and human terms.

Regarding technique, this provides the individual with skills to develop excellence in their activity and thereby reach the dimension of expression in their work: "the belief in technical mastery and the search for this create expression" (Sennett, 2021, p. 197). To this effect, one needs to understand that the process of technical development results in expression, it is not an end in itself. This very relationship (technique-expression) relates to the concept of *whole gesture* proposed

by Lochmann (2020), who advocates that a technical movement is not only produced by the main movement that is observed, but that others are also involved that, in turn, use other parts of the body and activate cognitive skills (the dimension of expression).

Internalising these movements, as with those of an instrumentalist, requires sustained repetition to consciously shape them and combine them with the other movements belonging to the craft. The result is a *savoir faire* (excellence) that evolves through experience and that "thereby consists of a process of appropriating life experiences" (Lochmann, 2020, p. 75). Furthermore, an artisanal action does not actually end at the technical point where a problem is solved, but rather the mark made by the craftsman (expression), the collective (trade-community), and, ultimately, the contribution to the common good *(telos)* are all involved in the activity.

Lastly, as a practice *for* and *in* a community, co-operation can be an essential value to achieve the goals of craftsmanship. Teamwork is strengthened during the transmission: despite the team members having different levels of experience and know-how, they all work together to co-produce or co-create something for the community. In such situations, where individuals can see their own contribution, both failure and success are shared in the same way (Lochmann, 2020). As this author explains, the activity is organised around *supportive responsibility*, where everybody participates in organising the task. In conclusion, community is the social and cultural context that provides the knowledge of what any craft is (Sennett, 2021).

4. Practising an instrument, a prerequisite for music

The foregoing has all been related to *how* specialised instrumental practice can be educational. Having said that, education has become a universal right, and, in connection with this, research offers a *why* specialised instrumental learning should be considered education.

Although the teaching/learning processes are different for music depending on the social and educational context, one characteristic that applies to all cultures is the organologic condition of music (Sève, 2018). Music and instruments are constituent elements of cultures everywhere around the world and throughout the ages: "total coexistence in a musical work is coexistence subject to the use of the instrument" (p. 109); this leads to the conclusion that "the instrument implies the (ontological) condition of music […] in that it is always participatory and active" (p. 136). Music is instrumental, even when it is vocal, as instruments are the basis for the construction of sound universes in all cultures. Moreover, a primary characteristic of instrumental music is mediation. The instrumental nature of music requires skills that cannot be acquired either mediately, vicariously or spontaneously, nor without training, and it involves the person who handles the instrument. As in craftsmanship, it is not possible to exclude the body of the person who is performing the rendition. It leads to the acquisition of habits that are internalised and superimposed on the human being's natural abilities, the creation of a *musical body* as a *second nature* (an Aristotelian concept). For this reason, corporeality is *essential* to music, the 'instrumental movement', which is solely facilitated by the instrument and which "embeds music in the body" (Sève, 2018, p. 136). This thereby joins the ideas of art-craftsmanship, technique-expression, dichotomies that are merely parts of a whole, of a human practice.

In the same way, the instrumentalist's sensory experience varies depending on the type of instrument. As Sève (2018) describes very clearly, "the image of the instrument as an extension of the hand [body] indicates in this case an intimacy between the musician's movements and the instrument's responses, built over time, acquired as a result of effort and patience" (p. 87). In the subject-object relationship, which is created through musical activity, a state of continuity is produced that is inherent in the phenomenon of music. Continuity from the transfer of energy that enables music to flow through time.

Lastly, Sève (2018) proposes two musical categories that may be useful in specialised instrumental teaching, which are as follows: *works for action* and *works for listening*. Works for action are those that "tend to produce certain extramusical effects and are interpreted by the listeners' extensive engagement" and works for listening are those that "are designed to please enthusiasts' aesthetic tastes…, they simply enjoy them, seeking nothing more" (p. 119). The essential difference is that the former fulfil a function, they are located in a place and social time; the others are not. These categories are not fixed and movement between them depends on how they are used.

In this way, practising an instrument is universally present, whether by means of an instrument or the voice, with procedures that are culturally widespread all around the world. Furthermore, by placing the focus

of musical activity on *action*, the tasks of education and social transformation can both be accomplished; these objectives have been outlined above and are necessary in all societies. Musical experiences through producing sound have an educational value that, although it is not the only one, is vital.

5. Implications for music education

This essay is confined to the assumptions of practical philosophy, in keeping with Aristotelian ethics. It shows a marked emphasis on a type of knowledge that could be described as a sketch, with particular interest in the specifics and details of human activity. Höffe (2008) highlights that "knowledge is not an end in itself. It represents an intermediate goal on the way towards the definitive main goal: *praxis*" (p. 42). Ethics as *praxis* is different from *poiesis*, which is not a knowledge intended to produce but rather to transform the agent (Zagal, 2008). This premise of transformative action forms the basis for an outline regarding specialised instrumental practice, focusing on virtue and character to affirm its educational value.

Music should be approached as a human and cultural practice using musical instruments. This means that the presence of instrumentalists and their instruments, their bodies and their materiality, are all necessary for music to exist *per se*. The aim of such an idea is to dispel the hegemonic tradition of classical music, prevalent in many conservatories and music schools, which has focused blindly on the score and the composer, whilst ignoring the performers, the musicians that enable what is on paper *to come to life* (Baricco, 2016).

Although it may be an end in itself (though not the ultimate one), this mechanical exercise, both physical and cognitive, affects the way human beings behave, beyond the world of music. Formalising any kind of musical practice requires automation and technical mastery as part of the learning process. Technique is a medium for expression and this, in terms of virtue, is a higher goal. The relationship with the instrument and its mastery should be understood as a possibility. According to Sève (2018), "the material becomes a source of inspiration. Behind the physical reality of materials, we need to distinguish, or invent, the musical potential that it conceals" (p. 67). A chance to be educated.

These days, there are other specialities, styles, musical genres that are taught in conservatories or music schools that are not prone to elitism or ethnocentrism (jazz, flamenco, modern music, traditional music, ancient music, etc.). These offer us new ways to understand music and, above all, new ways to use instruments and experience it. Therefore, they can be a source of enrichment for the whole educational community. However, not everything in this sense is positive. As demonstrated by Casas-Mas (2016), formalising the learning of music from other cultures involves practices specific to these institutions, such as literacy and standardisation. The question raised by this situation is whether it is possible, in this process of institutional formalisation, to prevent musical practices involving the very practices that research aims to avoid (automation, technique, music for listening, masterworks).

For example, one possible opening could be to promote musical hybrids, creating and experimenting with different types of music, which would represent a way of encouraging shared ethics, providing knowledge and understanding of others in the community (Higgins, 2018). In recent years, music education has emphasised the concept of interculturality (Bermell et al., 2014; Bernabé, 2012; Marrero, 2018; Olcina-Sempere & Ferreira, 2020; Porta, 2017; Rojas et al., 2018), and CE may be used to promote the civil virtue ethics underpinning its educational value (coexistence, diversity, inclusion) by using practices of hybridisation. These activities may be feasible in specialised instrumental practice as a result of solid instrumental skills.

Focusing on the teacher, Fernández-Morante (2018) illustrates how the existing teacher-student relationship in specialised instrumental teaching is an unequal relationship. There is a major power imbalance, where the teacher is the factor that most influences musical education. This figure is the sole judge of the student's musical quality, a judgement that decides the student's musical future. This is an approach based on *natural selection*, where many fall by the wayside for lack of talent. Here discipline, efficiency, compliance and competitiveness feature prominently among general behaviours. Likewise, educational work can also provide an example of *mala praxis*. Bautista and Fernández (2020) explain that this is revealed by mistakes, produced by inadequate training or egotistical errors. With reference to the latter, egocentricity is a variable that is linked to the individualism that dominates musical practice, as well as to competitiveness and the key figure in learning, the teacher. Another variable is narcissistic behaviour, which stems from musical demands, talent, excellence or survival in selective and competitive environments. As a result of all

this, a biased way of thinking prevails, where the only thing of value, that is valid, is what the teacher knows and controls.

In contrast, it has been demonstrated how ethics involving virtuous activity, craftsmanship, and care for the material aspect, can increase a passion for music and for doing things well, for the pleasure this produces. Here the educator plays a decisive role, as their relationship with the student needs to be the same as with the material (musical) aspect; their ultimate goal is no longer music, but the learner. In this learning process, the teacher should bear in mind the limitations of each individual, leaving enough time for each to give the best of themselves, always with a view to human flourishing. Teaching is a caring profession, based on commitment, respect, the common good, doing good. A responsibility that is assumed by the educator who understands musical excellence as a means to achieving human excellence, virtue (Regelski, 2012). There has been discussion about the professional identities of music teachers, in which, mostly, musical identity is superimposed on pedagogical identity as a result of training or professional experiences (Carrillo et al., 2015; Aróstegui, 2013; Ballantyne et al., 2012; Jorquera, 2008). However, this article advocates for commitment and responsibility by those who teach students, who have to accept the consequences of their actions and employ prudence in the Aristotelian sense.

Teachers should not act alone; they need their peers, which means that they cannot work in isolation, that teamwork and collaboration should be encouraged and implemented. The musician-teacher is not alone in their work. Music education needs, above all else, a musical community that shares the same aim. Communities where human beings are motivated by the same drivers of learning and enjoyment of music. As an example, what is known as *community music* shows features of this code of virtue ethics in non-formal environments, which could be suitable. For example, the participation of the elderly and children with different levels of expertise, everyone being completely engaged, a show of *committed solidarity* or community spirit (Lee et al., 2017; Chong et al., 2013; Karlsen et al., 2013). Musical activity throughout one's life where striving for excellence is not seen as a result but rather as a process (Henley & Higgins, 2020), as well as serving a purpose for the future, reaching beyond the time at school (Westerlund, 2019). Music as part of daily life (Oehrle et al., 2013), a type of active leisure that eschews overtones of privilege and reinforces the idea of the good life through music (Mantie, 2015). In the case of Spain, it has also been shown that specialised instrumental teaching (formal) that is included in centres for the mandatory, basic stages of education, can have a positive effect in academic terms and, what is more significant, on skills and social competencies in accordance with virtues (Barrientos-Fernández et al., 2019; Andreu, 2012).

6. Conclusions

The main objective of this article has been to show that the teaching of specialised instrumental practice can be educational. Moreover, it should be educational in the ethical terms described throughout the text for two reasons. Firstly, when the issue concerned is the concept of education *in* and *through* music, it is taken for granted that they are included in the same legislative framework; in this sense, they share principles, purposes and objectives originating in the shared, public concept of education. Additionally, still in a formal context, the great majority of students who receive specialised musical education are, at the same time, students in the general stage of education; therefore, if only out of coherence and common sense, it is essential for processes to be consistent with each other. This is what Touriñán (2016) terms *education through music*, where the two educational spheres are involved.

Secondly, from the perspective of ethical/moral engagement, if mala praxis has been the subject of criticism for decades and there have been reports of attitudes that are not appropriate in educating human beings, this has not been due to a lack of an ethical approach, but rather because it was not suitable in educational terms. Therefore, specialised instrumental practice and the teaching/learning processes have to shoulder the responsibility for caring for the students' human needs, despite the fact that the goal is to educate *future professionals* (human beings).

Lastly, there is a second objective underlying the whole research: placing a value on music and learning it as a medium for character education, a way to achieve human flourishing and excellence. This involves building musical communities, in line with the indications made by Regelski (2017) when he speaks of the *sociability* (the power of socialisation) that is inherent in music, a condition that gathers a group of people together around their ultimate goal through human practices such as music.

References

Andreu, M. (2012). *L'assoliment de les competències bàsiques en alumnes de centres integrats de primària i música. Construcció i aplicació d'un instrument d'avaluació de les competències bàsiques i anàlisi comparativa dels resultats obtinguts en alumnes de sisè de primària de centres integrats de música i d'un grup control [The attainment of basic competences by pupils in centres that integrate primary and music education. The development and application of an instrument for assessing the basic competences and the comparative analysis of results obtained by 11 to 12-year-old pupils in primary schools with an integrated music syllabus and those obtained by a control group]* [Doctoral dissertation, Universidad Autónoma de Barcelona]. Dipòsit Digital de Documents de la UAB. https://hdl.handle.net/10803/96516

Aristóteles. (2010). *Ética a Nicómaco[Nicomachean ethics]* (J. Pallí, Trans.). Gredos.

Aristóteles. (2015). *Política [Politics]* (C. García, & A. Pérez, Trans.) (2nd ed.). Alianza.

Aróstegui, J. L. (2011). Por un currículo contrahegemónico: de la educación musical a la música educativa [In support of a counter-hegemonic curriculum: from music education to instructional music]. *Revista da ABEM*, *19* (25), 19-29. https://revistaabem.abem.mus.br/revistaabem/article/view/187

Aróstegui, J. L. (2013). El desarrollo de la identidad profesional del profesorado: el caso del especialista de música [The development of the professional identity of teachers: the case of the music specialist]. *Revista Interuniversitaria de Formación del Profesorado*, *27* (3), 145-159. http://hdl.handle.net/10201/121563

Ballantyne, J., Kerchner, J. L., & Aróstegui, J. L. (2012). Developing music teacher identities: An international multi-site study. *International Journal of Music Education, 30* (3), 211-226. https://doi.org/10.1177/0255761411433720

Baricco, A. (2016). *El alma de Hegel y las vacas de Wisconsin. Una reflexión sobre música culta y modernidad [The soul of Hegel and the cows of Wisconsin. A reflection on classical music and modernity]*. Siruela.

Barnes, J. (1999). *Aristóteles [Aristotle]*. Cátedra.

Barrientos, A., Sánchez, R., & Arigita, A. (2019). Rendimiento académico, musical e inteligencias múltiples en alumnos preadolescentes de un centro específico de música [Academic, musical performance and multiple intelligences in pre-adolescent students of a specific music center]. *European Journal of Child Development, Education and Psychopathology*, *7* (2), 119-132. https://doi.org/10.30552/ejpad.v7i2.113

Bautista, A., & Fernández, B. (2020). Mala praxis en las enseñanzas instrumentales: implicaciones para la formación docente [Malpractice in instrumental teaching: Implications for teacher education]. *Revista Electrónica de LEEME*, (46), 240-261. https://doi.org/10.7203/LEEME.46.18013

Berkowitz, M., & Bier, M. (2005). *What works in character education: A research-driven guide for educator*. Character Education Partnership.

Bermell, M. Á., Bernabé, M.ª del M., & Alonso, V. (2014). Diversidad, música y competencia social y ciudadana: contribuciones de la experiencia musical [Diversity, music and social and civic competence: Contributions of musical experience]. *Arbor*, *190* (769), a164. https://doi.org/10.3989/arbor.2014.769n5003

Bernabé, M.ª del M. (2012). Contextos pluriculturales, educación musical y educación intercultural [Multicultural contexts, music education and intercultural education]. *El artista*, (9), 190-214. https://www.redalyc.org/articulo.oa?id=87424873012

Bernal, A., González-Torres, M. C., & Naval, C. (2015). La educación del carácter. Perspectivas internacionales [Character education. International perspectives]. *Participación educativa. Revista del Consejo Escolar del Estado*, *4* (6), 35-45.

Bowman, W. (2012). Practices, virtues ethics, and music education. *Action, Criticism, and Theory for Music Education*, *11* (2), 1-19.

Burbules, N. C. (2019). *Phronesis* y complejidad [Phronesis and complexity]. *Teoría de la Educación. Revista Interuniversitaria*, *32* (1), 11-22. https://doi.org/10.14201/teri.20846

Carrillo, C., Baguley, M., & Vilar, M. (2015). The influence of professional identity on teaching practice: Experiences of four music educators. *International Journal of Music Education*, *33* (4), 451-462. https://doi.org/10.1177/0255761415582348

Casas-Mas, A. (2016). Mediaciones instrumentales entre distintas culturas de aprendizaje musical [Instrumental mediations between different music learning cultures]. *Mediaciones Sociales*, *15*, 151-167. http://dx.doi.org/10.5209/MESO.54548

Castro, V. (2014). El valor de la música en nuestras escuelas [The value of the music in our schools]. *Revista Internacional de Investigación e Innovación en Didáctica de las Humanidades y las Ciencias*, (1), 61-67.

Chong, S., Rohwer, D., Emmanuel, D., Kruse, N., & Smilde, R. (2013). Community music through authentic engagement: bridging community, school, university and art groups. In K. K. Veblen, S. J. Messenger, M. Silverman, & D. J. Elliott (Eds.), *Community music today* (pp. 151-168). Rowman & Littlefield Publishers.

Cook, N. (2001). *De Madonna al canto gregoriano. Una muy breve introducción a la música [From Madonna to Gregorian chant. A very short introduction]*. Alianza.

Cuscó, J. (2013). El valor educatiu de la música. Una reflexió antropològica [The educational value of music. An anthropological reflection]. *Temps d'Educació*, (45), 255-272. https://raco.cat/index.php/TempsEducacio/article/view/274661

Dewey, J. (2014). *Naturaleza humana y conducta. Introducción a la psicología social [Human nature and conduct. Introduction to social psychology]*. Fondo de Cultura Económica.

Duckworth, A. L., & Meindl, P. (2018). Clarifying character education. Commentary on McGrath. *Journal of Character Education*, *14* (2), 37-39.

Estrela, K. A. D. F. (2018). El papel de la música en la educación según la *Política* de Aristóteles [The role of music in education according to Aristotle's *Politics*]. *Revista Fragmentos de Cultura - Revista Interdisciplinar de Ciências Humanas*, *28* (4), 465-471. https://doi.org/10.18224/frag.v28i4.6816

Fernández, B., & Casas, A. (2019). Por qué enseñar música no es suficiente: educación musical y su red nomológica [Why teaching music is not enough: Musical education and its nomological network]. *Revista Internacional de Educación Musical*, *7* (1), 3-13. https://doi.org/10.1177/2307484119878631

Fernández-Morante, B. (2018). Violencia psicológica en la educación musical actual en los conservatorios de música [Psychological violence in current musical education at conservatoires]. *Revista Internacional de Educación Musical*, *6* (1), 13-24. https://doi.org/10.12967/RIEM-2018-6-p013-024

Fuentes, J. L. (2018). Educación del carácter en España: causas y evidencias de un débil desarrollo [Character education in Spain: Reasons and evidences of a weak development]. *Estudios Sobre Educación*, *35*, 353-371. https://doi.org/10.15581/004.35.353-371

García, I. (2013). Cuatro sentidos de la música en la filosofía griega [Four music senses in the Greek philosophy]. *Azafea: Revista de Filosofía*, *15*, 21-37. https://revistas.usal.es/dos/index.php/0213-3563/article/view/12250

Harold, J. (2016). On the ancient idea that music shapes character. *Dao*, *15*, 341-354. https://doi.org/10.1007/s11712-016-9515-9

Henley, J., & Higgins, L. (2020). Redefining excellence and inclusion. *International Journal of Community Music*, *13* (2), 207-216. https://doi.org/10.1386/ijcm_00020_1

Hemsy, V. (2011). Educación musical siglo XXI: problemáticas contemporáneas [Music education - 21st century. A contemporary view]. *Revista da ABEM*, *25*, 11-18. https://revistaabem.abem.mus.br/revistaabem/article/view/186

Higgins, K. M. (2018). Connecting music to ethics. *College Music Symposium*, *58* (3), 1-20. https://doi.org/10.18177/sym.2018.58.sr.11411

Höffe, O. (2008). *El proyecto político de la modernidad [The political project of modernity]*. Fondo de Cultura Económica.

Jiménez, M. (2016). Aristotle on becoming virtuous by doing virtuous actions. *Phronesis*, *61* (1), 3-32. https://doi.org/10.1163/15685284-12341297

Jorgensen, E. R. (2003). The aims of music education: A preliminary excursion. *The Journal of Aesthetic Education*, *36* (1), 31-49. https://doi.org/10.2307/3333624

Jorquera, M. C. (2006). Educación musical: aportes para su comprensión a partir del origen de la disciplina [Music education: Contributions to its understanding based on the origins of the discipline]. *Investigación en la escuela*, (58), 69-78. https://revistascientificas.us.es/index.php/IE/article/view/7318

Jorquera, M. C. (2008). The music educator's professional knowledge. *Music Education Research*, *10* (3), 347-359. https://doi.org/10.1080/14613800802280084

Karlsen, S., Westerlund, H., Partti, H., & Solbu, E. (2013). Community music in the Nordic countries: Politics, research, programs, and educational significance. In K. K. Veblen, S. J. Messenger, M. Silverman, & D. J. Elliott (Eds.), *Community music today* (pp. 41-58). Rowman and Littlefield Publisher.

Kristjànsson, K. (2015). *Aristotelian character education*. Routledge.

Lee, J., Krause, A. E., & Davidson, J (2017). The PERMA well-being model and music facilitation practice: Preliminary documentation for well-being through music provision in Australian schools. *Research Studies in Music Education, 39* (1), 73-89. https://doi.org/10.1177/1321103X17703131

Lickona, T. (1999). Educación del carácter: cultivar la virtud [Character education: cultivating virtue]. In C. Reigeluth (Ed.), *Diseño de la instrucción. Teorías y modelos: un nuevo paradigma de la teoría de la instrucción [Instructional design. Theories and models: a new paradigm of instructional theory]* (pp. 139-160). Aula XXI/Santillana.

Lickona, T. (2018). Reflections on Robert McGrath's "What is character education?". *Journal of Character Education*, *14* (2), 49-57.

Lochmann, A. (2021). *La vida sólida. La carpintería como ética del hacer [The solid life. Carpentry as an ethic of doing]*. Catarata.

MacIntyre, A. (1987). *Tras la virtud [After virtue]*. Austral.

Mantie, R. (2015). Liminal or lifelong leisure, recreation, and the future of music education. In C. Randles (Ed.), *Music education: Navigating the future* (pp.167-182). Routledge.

Marín-Liébana, P., Blasco, J. S., & Botella, A. M. (2021). Hacia una conceptualización de la educación musical crítica: aplicación de los paradigmas científicos, las teorías curriculares y los modelos didácticos [Towards a conceptualization of critical music education: applications of scientific paradigms, curricular theories and teaching models]. *Márgenes, Revista de Educación de la Universidad de Málaga*, *2* (2), 3-24. https://doi.org/10.24310/mgnmar.v2i2.10016

Marrero, A. M. (2018). El valor pedagógico de la educación artística para la inclusión [The pedagogical value of arts education for inclusion]. In M.ª I. González, & A. F. Canales (Coords.), *Educación e inclusión: aportes y perspectivas de la educación comparada para la equidad. XVI Congreso Nacional Educación Comparada Tenerife [Education and inclusion: Contributions and perspectives of comparative education for equity. XVI National Congress on Comparative Education Tenerife]* (pp. 91-96). Servicio de Publicaciones de la Universidad de la Laguna. http://doi.org/10.25145/c.educomp.2018.16.012

Matthews, W. (2020). De la pianola al ordenador: accesibilidad y digitalización en la música del siglo XXI [From the pianola to the computer: accessibility and digitisation in 21st-century music]. In P. Alcalde, & M. Hervás (Eds.), *Terremotos musicales. Denarraciones musicales en el siglo XXI [Musical earthquakes. Musical denarrations in the 21st century]* (pp. 69-79). Antoni Bosch.

McGrath, R. E. (2018). What is character education? Development of prototype. *Journal of Character Education*, *14* (2), 23-35.

Mumford, L. (2014). *Arte y técnica [Art and technics]*. Pepitas de calabaza.

Oehrle, E., Akombo, D. A., & Weldegebriel, E. (2013). Community music in Africa: Perspectives from South Africa, Kenya, and Eritrea. In K. K. Veblen, S. J. Messenger, M. Silverman, & D. J. Elliott (Eds.), *Community music today* (pp. 61-78). Rowman and Littlefield Publisher.

Olcina-Sempere, G., & Ferreira, M. (2020). La didáctica de la expresión musical y la inclusión: un estudio mixto realizado con estudiantes de grado de maestro sobre la importancia de la música en la educación primaria [The didactics of musical expression and inclusion: a mixed study with student teachers on the importance of music in primary education]. *ArtsEduca*, (25), 23-40. http://dx.doi.org/10.6035/Artseduca.2020.25.2

Porta, A. (2017). Conocer el entorno social de la música, una condición necesaria en la educación musical postmoderna [Know the social environment of music, a necessary condition in postmodern musical education]. *DEDiCA. Revista de Educação e Humanidades*, (12), 69–82. https://doi.org/10.30827/dreh.v0i12.6781

Pozo, J. A., Bautista, A., & Torrado, J. A. (2008). El aprendizaje y la enseñanza de la interpretación musical: cambiando las concepciones y las prácticas [Learning and teaching musical performance: Changing conceptions and educational practices]. *Cultura y Educación, 20* (1), 5-15. https://doi.org/10.1174/113564008783781495

Regelski, T. A. (2012). Musicianism and the ethics of school music. *Action, Criticism, and Theory for Music Education*, *11* (1), 7-42. http://act.maydaygroup.org/volume-11-issue-1/

Regelski, T. A. (2017). Pragmatism, praxis, and naturalism: The importance for music education of intentionality and consummatory experience in musical praxes. *Action, Criticism, and Theory for Music Education*, *16* (2), 102-143. https://doi.org/10.22176/act16.1.102

Rojas, A., Pestano, M., & Rodríguez, H. (2018). Educación musical como eje para el fortalecimiento de la creatividad e inclusión [Music education as an axis for strengthening creativity and inclusion]. *Creatividad y sociedad: revista de la Asociación para la Creatividad*, (28), 209-230. http://creatividadysociedad.com/wp-admin/Art%C3%ADculos/28/10.pdf?_t=1576012054

Sanderse, W. (2015). An Aristotelian model of moral development. *Journal of Philosophy of Education*, *49* (3), 382-398. https://doi.org/10.1111/1467-9752.12109

Sennett, R. (2021). *El artesano [The craftman]*. Anagrama.

Sève, B. (2018). *El instrumento musical. Un estudio filosófico [The musical instrument. A philosophical study]*. Acantilado.

Small, C. (1989). *Música, sociedad, educación [Music, society, education]*. Alianza.

Suñol, V. (2018). La función emocional de la educación musical en Aristóteles [The emotional function of musical education in Aristotle]. *Praxis Filosófica*, (47), 137–155. https://doi.org/10.25100/pfilosofica.v0i47.6602

Suñol, V. (2021). La relevancia filosófica de la educación musical en la *Política* de Aristóteles [The philosophical relevance of musical education in Aristotle's *Politics*]. *Classica, 34* (1), 205-221. https://doi.org/10.24277/classica.v34i1.958

Surós, C. (2020). El tiempo a la vez: internet, la música y nosotros [Time at once: internet, music and us]. In P. Alcalde, & M. Hervás (Eds.), *Terremotos musicales. Denarraciones musicales en el siglo XXI [Musical earthquakes. Musical denarrations in the 21st century]* (pp. 139-148). Antoni Bosch.

The Jubilee Centre for Character and Virtues. (2017). *The Jubilee Centre framework for character education in schools* (2nd ed.). University of Birmingham.

Touriñán, J. M. (2016). Educación artística: sustantivamente "educación" y adjetivamente "artística" [Arts education: Substantively "education" and adjectively "arts"]. *Educación XX1*, *19* (2), 45-76. https://doi.org/10.5944/educxx1.16453

Touriñán, J. M., & Longueira, S (2010). La música como ámbito de educación. Educación «por» la música y educación «para» la música [The music like scope of education. Education «through» the music and education «for» the music]. *Teoría de la Educación. Revista Interuniversitaria*, *22* (2), 151-181.

Vargas, L., & González-Torres, M. C. (2009). La revitalización de la educación del carácter en el ámbito psicoeducativo actual: aportaciones desde las ciencias de la prevención y la psicología positiva [The revitalization of character education in today's educational psychology arena: Contributions from the sciences of prevention and positive psychology]. *Electronic Journal of research in Educational Psychology*, *7* (19), 1379-1418. https://doi.org/10.25115/ejrep.v7i19.1339

Vilar, M. (2004). Acerca de la educación musical [On music education]. *Revista Electrónica de LEEME (Lista Europea de Música en la Educación)*, (13), 1-25. https://ojs.uv.es/index.php/LEEME/article/view/9748

Westerlund, H. M. (2019). The return of moral questions: Expanding social epistemology in music education in a time of super-diversity. *Music Education Research*, *21* (5), 503-516. https://doi.org/10.1080/14613808.2019.1665006

Zagal, H. (2008). *Ensayos de metafísica, ética y poética: los argumentos de Aristóteles [Essays on metaphysics, ethics and poetics: the arguments of Aristotle]*. Eunsa.

Zagal, H. (2019). La música en Aristóteles [Music in Aristotle]. *Open Insight*, *10* (19), 149-163. http://openinsight.com.mx/index.php/open/article/view/358

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Colombia Creativa Artists' Professionalisation Programme (PPACC - Programa de Profesionalización de Artistas Colombia Creativa): Evaluation of the organisation and musical training accomplished

Programa de Profesionalización de Artistas Colombia Creativa (PPACC): valoración de la organización y formación musical conseguidas

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Abstract:

Professional music education is still an emerging educational sector in some countries, as in Colombia. Within this sector, there are new, interesting initiatives that provide musical training for non-institutionalised professional groups, who would not otherwise be able to obtain academically valid credentials, given their geographic dispersion and employment situation in the country. In this sense, an analytical study associated with this area has been conducted to explore the general functioning and achievements in musical training of the Colombia Creativa Artists' Professionalisation Programme (PPACC - Programa de Profesionalización de Artistas Colombia Creativa), identifying weaknesses, strengths and opportunities for improvement. This programme is sponsored by the Ministry of Culture of Colombia and is one of the main ways for professional musicians who could not be trained in official centres to achieve certification of their competencies with academic validity in this country, providing them with clearly improved employability within the field of musical training. For this research, a qualitative methodology was used, by means of interviews and an emergent content analysis was conducted with the NVivo program. Among the main results, of note are the organisational difficulties encountered and the tensions and rejection of the programme by some participants. Also strengths such as the flexibility of the programme and the opportunity it provides for national musical training of groups of artists who are not institutionally professionalised.

Keywords: music education, Colombia, professionalisation of artists, management of educational programmes, employability of music educators.

Resumen:

La educación musical profesionalizante pertenece todavía a un sector educativo emergente en algunos países, como ocurre en Colombia. Dentro de este ámbito, surgen interesantes iniciativas de ayuda a la formación musical para colectivos profesionales no institucionalizados, que no podrían contar con otras vías de obtención de credenciales con validez académica dada su dispersión geográfica y situación laboral en el país. En este sentido, se ha realizado un estudio de análisis para explorar el funcionamiento general y los logros en formación musical conseguidos por el Programa de Personalización de Artistas Colombia Creativa (PPAC), así como para identificar debilidades, fortalezas y oportunidades de mejora. Este programa está auspiciado por el Ministerio de Cultura de Colombia y es una de las principales vías con que cuentan los músicos profesionales que no pudieron formarse en centros oficiales para lograr una certificación de sus competencias con validez académica en el país. Ello supone una clara mejora de la empleabilidad dentro del ámbito de la formación musical. En esta investigación, se aplicó una metodología de tipo cualitativo y se realizaron entrevistas y un análisis de contenido emergente mediante el programa NVivo. Entre los principales resultados, destacan las dificultades encontradas de tipo organizativo y las tensiones y el rechazo hacia

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el programa de algunos participantes. También fortalezas como la flexibilidad del proyecto y la oportunidad de capacitación musical nacional para colectivos de artistas no profesionalizados institucionalmente.

Palabras clave: formación musical, Colombia, profesionalización de artistas, gestión de programas educativos, empleabilidad de educadores musicales.

1. Introduction

Education is considered to be a personal possession and a process that is shared by all individuals, through which they obtain skills, knowledge, behaviours and principles (Anderson & Fejes, 2005; Tejada & Thayer, 2019). This implies that learning is not solely limited to the formal education system, but rather, as emphasised by Folkestad (2006), Romeu-Fontanillas et al. (2020), Sangrá et al. (2021) and Souto-Seijo et al. (2021), other non-formal and informal educational spaces enrich and nourish this process.

Melnic and Botez (2014) define education as a process including many factors that contribute both to the personal and intellectual education of the human being. According to Kashif and Cheewakrakokbit (2017) and Tejada and Thayer (2019), education can be defined as the continuous process of human and cultural training that provides individuals with essential tools and knowledge for their growth and development in society.

The scientific literature also indicates that music in education has a positive effect on the acquisition of benefits from such different fields as psychology, medicine, anthropology, neurology or education (Corrigall & Trainor, 2011). This makes it an extremely significant field within the area of educational policies in all countries.

In terms of the situation of higher education in music based on a transnational analysis and of the similarities and differences regarding educational models in different countries and cultures, several studies reveal university approaches to the orientation and specialisation of future professionals in the field of music. Along these lines, Sanchez-Escribano et al. (2022) conducted a comparative study of instrumental music education in the United States, Spain and Singapore. It demonstrates the emergence of four analysis dimensions in the three countries studied: accessibility, the value assigned to instrumental music education, professionalisation and specialisation, and qualifications and requirements for teachers. As convergence factors in the three cases, these authors indicate three distinct teacher profiles: the first corresponds to those who have mainly received training in instrumental music but have little or no educational and pedagogical training; the second professional profile is the exact opposite; and the third places equal importance on pedagogical knowledge and musical skills.

Similarly, López-León et al., (2015), Wang and Lorenzo (2018), Lorenzo et al., (2023) and Lorenzo and Turcu (2023) have conducted international studies on musical training and employability of teachers in Puerto Rico, China, Colombia and Romania, and they coincide in detecting the three educational models found by Escribano et al. (2022). This makes it possible to establish a similar pattern for training and employability of music degree graduates at universities in most countries around the world. Two clear positions appear in this pattern: the musical pedagogue and the practical musician, thus producing an ambivalent situation that has not been fully resolved in any educational system.

In this context, there is a need for this research, which analyses the Colombia Creativa Artists' Professionalisation Programme (PPACC - Programa de Profesionalización de Artistas Colombia Creativa). The PPACC is an institutional music programme from the Columbian Ministry of Culture, designed to detect the strengths and weaknesses of the specific training offered and implement strategies to improve its development.

2. Music education in Colombia

According to Dias (2014) and Hyland (2013), higher education is an educational cycle that provides a space for interconnections between fields of knowledge. Given its interdisciplinary nature, it can influence different aspects of knowledge, such as research; innovation; civic and professional education, both critical and intellectual; or science and technology. It can also drive major social, economic and cultural transformations involving different issues (Langa & David, 2006).

Nevertheless, in many countries, higher education still faces major difficulties. In Colombia, there are restrictions and a lack of opportunities regarding access to this educational level for a considerable proportion of society (Langa & David, 2006; McAleavy & O'Hagan, 2004). As Dias (2007) states, over 68% of the higher education institutions (HEIs) and higher education programmes in Colombia belong to the private sector. This puts its gross enrolment ratio for higher education far below the other countries in the OECD (Organisation for Economic Co-operation and Development) (Gómez & Celis, 2009; Herrera & Infante, 2003). In fact, although the country has made major progress over the last two decades, as different studies show [Melo-Becerra et al., 2017; MEN (Colombian Ministry of Education), 2014], the enrolment rate is relatively low in international terms, even more so if we compare it to developed countries (MEN, 2014).

Furthermore, in the comprehensive training of human beings, arts and music education is a tool that favours the development of cognitive, emotional and social skills and abilities (Corrigall & Trainor, 2011; Diamond, 2013; Guhn et al., 2019). However, in Colombia, in terms of representativity and importance, the area of training in arts and music has gradually lost ground in the context of school education (Aróstegui & Kyakuwa, 2021; Rodríguez, 2015, 2016).

Arts education provides a space for artists, trainers, teachers and learners from different intercultural backgrounds to meet and participate (Ñáñez-Rodríguez & Castro-Turriago, 2016). Likewise, music education concerns both the aesthetic, sensory and intellectual sphere and the emotional, affective and social aspect (Sala & Gobet, 2017).

Colombian national regulations cover all the arts under a single educational area called *arts education*; therefore, it is very common to employ a single teacher to cover more than one artistic field. This means that little importance is given to their speciality (Casas, 2015). As a result, as Rodríguez (2016) indicates, teachers provide education based on programmes that are mostly lists of contents involving general knowledge, but without the necessary tools to create sound, long-term processes. Within these dynamics, we find one of the most frequent problems in the field of formal music education, not only in schools but also at higher levels: the lack of relevance and contextualisation of teacher training (Cremades-Andreu & García, 2017).

In this way, despite the mandatory nature of arts education in the Colombian school system at the levels of basic and secondary education, the criteria for quality and enrollment do not meet expectations. Moreover, due to the lack of scientific research relating to artistic-pedagogical experiences, it is difficult to cite studies that support this system (Ministry of Culture, 201). This has led to such a reduction in the value of arts and music education in schools that it has swiftly moved to extra-curricular spaces involving non-formal and informal education. The Ministry of Culture has assumed the responsibility of guaranteeing enrolment, quality, implementation, guidance and supervision, tasks that are, in theory, the responsibility of the Colombian Ministry of Education (Arenas, 2011; Rodríguez, 2015).

In relation to the circumstances and quality of higher education programmes for music in Colombia, Cárdenas and Lorenzo (2013a and 2013b) indicate that these programmes have not yet achieved a sufficient culture of change, evaluation and improvement to make their curricular projects relevant and coherent. This situation has created inequalities between the necessary training resulting from a professional music programme, with its own characteristics aimed at professionalizing performing musicians, and the training involved in music degrees, which have to take into account the artistic and musical education that students have received in the different levels of the general, pre-university system of teaching. Therefore, it seems that, in Colombia, there has not been a sufficiently clear curricular basis to address the differences in training of these two groups of target students, what has created an imbalance between the training received by each group and the professional duties of higher education graduates once they enter employment (Lorenzo et al., 2023).

In contrast, it should be emphasised that teachers of music degrees show great interest in participating in the processes of designing and modifying curricula for educational programmes, both as part of a music degree and for professional musicians. However, such disposition is severely limited by the fact that these teachers are not usually sufficiently involved in the institutional management processes by holding management positions (Cárdenas & Lorenzo, 2013a; Cárdenas et al., 2015).

3. The pedagogical model of the Colombia Creativa Artists' Professionalization Programme (PPACC)

In compliance with the UNESCO (2006) guidelines on the creation of programmes to promote and contribute

to artists' well-being and quality of life, and in accordance with demands for the requalification, updating, promotion and transferability of the skills and competencies of the Colombian artistic and cultural sector, in 2002, work began on charting the paths of action that eventually led, in 2007, to the consolidation of the Colombia Creativa Artists' Professionalisation Programme (PPACC). This is a special policy concerning higher education in the arts, designed by means of a collaboration between the Ministry of Culture and the Ministry of Education, in association with ACOFARTES (Asociación Colombiana de Facultades y Programas de Artes – Colombian Association of Arts Faculties and Programmes) and ICETEX (Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior – Colombian Institute of Educational Credit and Technical Studies Abroad) (Ministry of Culture & ACOFARTES, 2011). This synergy among institutions "seeks to address the lack of vocational training for the country's artist-trainers, as a strategy aimed at providing qualifications for their work in the arts, pedagogy and cultural management" (Ministry of Culture, 2015, p. 5).

The PPACC is also a strategy that aims to consolidate and preserve the country's cultural expressions and traditions within the academic framework and prepare the way for interculturality and the dialogue of different types of knowledge. Its academic proposal, designed by all the participating institutions working together, indicates the strengthening and consolidation of a space for interaction and dialogue of knowledge between the western tradition and the different artistic and cultural expressions. These expressions have traditionally also had a real and effective influence in revitalizing the country's social and cultural panorama (Ministry of Culture & ACOFARTES, 2010). The PPACC, rather than being an educational programme, is a combination of complex, mid- and long-term strategies, which are essentially aimed at improving quality of life for empirical, self-taught or informal artists and educators in Colombia. This is a nationwide, public policy involving co-operation, social responsibility and inter-institutional alliances; a policy that is unique and innovative, not only in this country but generally across the whole of Latin America (ACOFARTES, 2011). It was the result of the Colombian State reflecting on the social debt it had incurred with the different sectors of the country's artists (Guzmán-Valenzuela, 2017).

Additionally, according to Green (2002, 2008), the PPACC is academically justified by several studies relating to how folk musicians acquire their skills and knowledge in an informal way, outside the formal learning system and without much help from trained instrumentalists. As this author points out, it is extremely interesting (and closely-linked to the PPACC work philosophy) to observe that the musical practices adopted by folk musicians correspond to the attitudes and values of informal learning that the Colombian programme has included in its academic content. Thus, it has incorporated auditory imitation, improvisation and experimentation as methodological classroom resources to bring informal learning ecologies for this type of music into the formal, disciplinary environment of music teaching in universities. Furthermore, Green highlights folk musicians' commitment and passion as their natural learning dimensions, which may have been a decisive factor in their increased motivation and participation in the PPACC academic programme and their success, both professionally and socially, among the public that this programme targets.

The PPACC uses strategic alliances with different public HEIs, which have made their curricular arts programmes available to the project. In other words, its implementation did not require the creation of new academic/curricular programmes. Rather, the existing ones in the different participating institutions were adapted and made more flexible depending on the specific peculiarities, characteristics and needs of this public policy (Ministry of Culture & ACOFARTES, 2010). As a consequence, there are various implementation models for the PPACC; the curricular and institutional conditions governing each academic programme mean that they are structured in a similar way, but they are not identical. Nevertheless, the public policy itself indicates that certain guidelines are unalterable.

In general terms, the version of the PPACC for music presents a training programme based on the same curriculum as the music degrees at the university where it is held. The participants are usually granted five semesters of university education after passing the admissions tests and they have to undertake a further five semesters of a curriculum structured around four components: a pedagogical component, an interdisciplinary component (the relationship between arts and education), a music discipline component (50% of the disciplinary training), and a research component, in which the participants prepare their degree project to obtain their qualification (Ministry of Culture, 2015).

The subjects on the PPACC curriculum are the same as those taught on the regular degree courses in music and music education at each university. Regarding the study load, it concentrates mainly on pedagogical and musical aspects that folk musicians have not been acquired previously. It is assumed that music theory and the development of musical interpretive competencies are skills that the participant has acquired at an earlier stage. Thereby, the programme does not repeat subjects that involve learning an instrument, but rather it provides others that are related to the reinforcement of musical areas such as harmony, the development of auditory perception and musical grammar.

As for the teaching staff involved, it is basically composed of the same teachers who regularly work at the universities that run the programme, with occasional invitations to speakers on a subject of educational, pedagogical or musical interest.

As the PPACC has been running for over ten years, this research aims to conduct an analysis and nationwide evaluation of the music programmes linked to the project, by examining the opinions and experiences of the different agents involved in the process: director or project manager at the Ministry of Culture, project co-ordinators at each university, teachers and graduates. The published study originated, partly, from the doctoral thesis *Análisis del programa formativo Colombia Creativa y evaluación de las titulaciones en música vinculadas al programa [Analysis of the educational programme Colombia Creativa and evaluation of the music qualifications associated with the programme]*, by Yuly Rodríguez Ramírez. Furthermore, this work tries to identify the strengths and weaknesses of the PPACC so as to establishing opportunities for improvement that reinforce the project in future stages of implementation.

4. Methodology

The methodology used is of a qualitative nature, based on identifying and structuring patterns and on describing and interpretating the data collected during the study, which are typically narrative or textual (Fernández, 2004). Within this research model, flexibility, fit and interaction between educational practice and research are essential aspects. Consequently, it is not one-way, linear or static, and there is always room for debate and differences, with the aim of both describing and interpreting practice (Santaella, 2016).

To this effect, the qualitative methodology used is similar, in a descriptive and analytical way (Quintana, 2006), to the description of a specific reality (Anguera, 2008), taking into account the different interactions, aspects and dimensions. Specifically, the research entails analysing the data collected and converting them into categories and codes by interpreting the results of the interviews and their relation to the study objectives and the review of the scientific literature consulted (Anguera, 2008; Drisko, 2008).

The process of analysing the data obtained through this research used the qualitative data analysis software NVivo 13 to categorise and code the information (Bauselas, 2004; Bazeley, 2002). In addition, a system of categories, subcategories and emergent codes has utilised (Anguera, 2008).

4.1. Participants

This study seeks to analyse and evaluate the structural and academic characteristics of the PPACC, placing particular emphasis on the music programmes linked to the project, and to assess the strengths, weaknesses and opportunities for improvement. It involved forty-three agents, who attended a semi-structured interview: a manager of the Colombia Creativa professionalisation programme at the Ministry of Culture, eight PPACC directors at the different participating institutions, fourteen teachers on the ten professional music programmes implemented under the PPACC and twenty PPACC graduates from the educational programmes Music and Degree in Music. Due to the geographical difficulty in locating interviewees for the programme in all the areas of participation, the decision was taken to select those who responded to the request to collaborate in the research and who represented the different stakeholders in the PPACC.

TABLE 1. Percentage distribution by gender of participants.

Gender	Directors	Teachers	Graduates
Men	11.6%	25.6 %	34.9%
Women	9.3%	7.0%	11.6%

TABLE 2. Frequencies and percentages by age ranges of participants in each study group.

Age in years	Directors		Teachers		Graduates	
	f	%	f	%	f	%
20-30	0	0.0%	0	0.0%	2	10.0%
31-40	2	22.2%	4	28.6%	7	35.0%
41-50	2	22.2%	5	35.7%	8	40.0%
51-60	2	22.2%	2	14.3%	3	15.0%
>61	3	33.3%	3	21.4%	0	0.0%

Regarding the PPACC admissions process, the folk musicians interested in participating had to go to the university of their choice based on their interest, convenience and/or proximity, with the documentation required for the programme. This process included several criteria that the regular university programmes did not contain, such as, for example, a minimum number of years of artistic and teaching experience, a minimum age of 28-30 years, or experience in the field of cultural project management. This was the first selection filter and the process was conducted overall by a university administrative department and/or a team of teachers that was created for each programme to manage the PPACC and increase curricular flexibility.

After the first access stage had been completed, the following stage involved the admissions test applications, which were adapted and/or made more flexible depending on each institution's criteria. In some cases, depending on the artists' artistic experience, knowledge and recognition in their field, it was considered that applicants could be exempted from certain specific musical tests, as their extensive experience attested to their mastery of the basic elements of the theoretical/musical language addressed in these tests.

4.2. Instrument

The data collection used a semi-structured interview model that was designed *ad hoc*, based on a series of questions that aimed to capture the interviewees' impressions concerning the subject of study (Fernández, 2013; Larenas & Díaz, 2012). In the educational field, the interview has been widely used, as an effective, easy and practical instrument that encourages dialogue among the different agents in the educational community (Zwiers & Morrissette, 1999), enabling the collection of a large amount of information (Creswell, 2003).

The interview content was assessed by expert judgement, with the participation of 29 experts connected to the area of music education and other areas related to educational, psychological and social research. The experts assessed the pilot interview following the indications contained in the introductory letter that they had received about the study, which explained how they should assess the instrument. They made their assessments according to the level of agreement ("hardly relevant" to "very relevant") with the wording and relevance of each item. The group of experts was composed of seventeen doctors, five doctoral students and seven academics with master's degrees. Of these, twenty-two belonged to different Colombian institutions and seven to higher education institutions in Spain and Brazil. After the review by the twenty-nine experts, a statistical analysis was conducted on the experts' assessments of each of the items, in line with the criteria established by Barbero et al. (2003). These criteria establish different decisions to take for each question depending on whether the value of the average of each item is equal to or higher than 2.5. The median value is also considered, while the 50th percentile (P50) should obtain values that are equal to or higher than 2.5. In addition, an ambiguity coefficient is established, which aims to measure dispersion in the experts' agreement, using the interquartile range as the criterion. Based on the above, three possibilities were established for each item: eliminate it, review/modify it or accept it.

After having included the recommendations from the group of experts, the final interviews were composed, taking into account the literature review conducted for each category proposed.

4.3. Procedure

The interviews were held with forty-three participants, via individual vídeo conferences on platforms such as Zoom and Google Meet. The qualitative analysis of the texts arising from the interviews used the following stages (Lorenzo, 2011): reduction of excessive textual data, reconstruction of the meaning of the interview texts, and inferences drawn from comparing the different meanings encountered in the interviews.

5. Results

Once the process of transcription and analysis of the forty-three interviews was completed, the next stage was to establish a system of categories and codes based on the emergent coding process (Burnard, 1991; Cho & Lee, 2014; Hsieh & Shannon, 2005; Mayring, 2000; López-León et al., 2015). The results obtained are shown below.

5.1. Category "difficulties-weaknesses-strengths" of the PPACC

Firstly, there is the category "difficulties-weaknesses-strengths" of the PPACC. This category defines three subcategories, corresponding to the difficulties, weaknesses and strengths of the PPACC overall, and of the institutions implementing this programme. The subcategory "difficulties of the PPACC" (DIFPR), consisting of three codes, identifies the general difficulties that the different groups of participants experienced during the process of implementing the PPACC. These are mainly related to administrative and management processes. Figures 1, 2 and 3 indicate some of the textual references identifying the interviewees' opinions about this subcategory.

Figure 1. Textual references for the code "difficulties of the PPACC" (DIFPR).

Difficulties regarding travel for the artists (DDES)	• "Some artists came from conflict zones, from red zones." • "Sometimes our students had trouble attending because this • programme involved a kind of grant, if we may call it that, but they had to pay for another part of it and to support themselves." • "The idea of travelling was too exhausting, because many of them didn't live here in Igabué and also because of their many commitments." • "We had people from Valledupar, people from the red zone, that was a rather complicated matter." • "I lived here in the town of Pasto and it was really easy for me but I know that many things were difficult for my classmates." • "It lasted all week and they had to pay for accommodation, to find a way to support themselves." • "They had a 10- or 12-hour journey and came straight to class, in other words, they came a very long way."

Figure 2. Textual references for the code "institutional difficulties" (DINS).

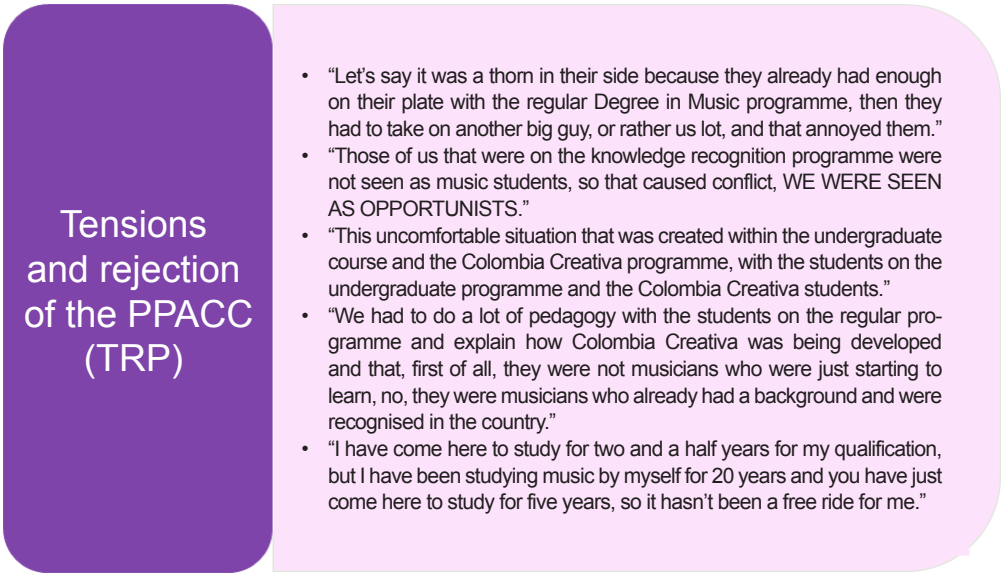
Institutional difficulties (DINS)	• "The university didn't have any experience of a process like this." • "For example, we had to take some compulsory subjects that were not negotiable for the University." • "This process has been very difficult with the universities because they are very set in their ways, sort of stuck on the matter of if you don't do Harmony I, you can't do Harmony II, that if you don't read a quaver first, you can't read the crochets afterwards." • "In the end I don't remember whether we managed to do it or not, I apologise for that, but we had real trouble changing sports training for another activity that had more to do with musical expression." • "We had rather a complicated situation in recruiting the teachers because the teaching staff didn't fully understand how it was going to be assessed and how these artists could join; let us say that they were worried about how to cover a 5-year curriculum in 2 and a half." • "The university should have been more supportive and not seen it as something strange or the weird programme, they should have understood too that there needed to be more flexibility in the administrative and academic/administrative platforms when handling marks, managing the curriculum with students and the administrative processes related to the recruitment and payment of the teachers."

As the programme was not offered in the regions where the artists were located, this made it very difficult for them to attend and travel to the educational centres for different reasons, whether related to finances, work or public order. This was even due to weather conditions such as landslides, which prevented the use of the country's main roads for long periods of time.

Figure 2 establishes that one of the main difficulties encountered by the PPACC relates to the lack of knowledge and experience of the universities in implementing a programme of this nature. In this sense, there were many discussions about how to adapt the curricula, how to reach agreements on what the artists were going to study or not study, how the curriculum for a five-year degree could be made more flexible so that it could be studied in half the time, etc. The greatest difficulty laid in making the higher education authorities (academic boards) understand the relevance and necessity of the PPACC for the country and make them aware of their ethical and social commitment to the programme and the students as a higher education institution.

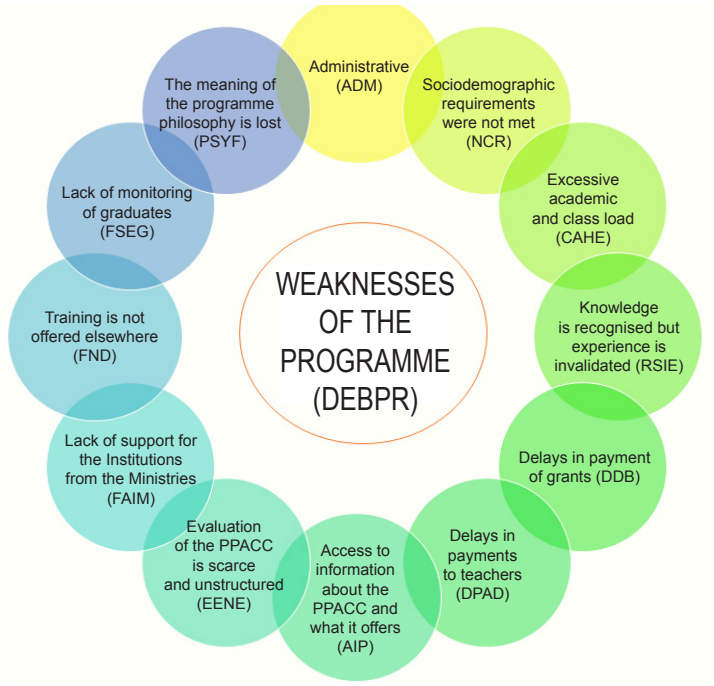
On another note, the subcategory "weaknesses of the PPACC" (DEBPR) is composed of a total of twelve codes that represent the main weaknesses of the PPACC, most of which are related to academic/administrative management.

FIGURE 3. Textual references for the code "tensions and rejection of the PPACC" (TRP).



According to the results in Figure 3, the PPACC created considerable tension and rejection, both in terms of the understanding of the students on the regular programme and that of the teachers themselves who taught the classes on these academic programmes. This meant that there was a need to socialise the project, involving both the team of teachers that were going to work on the PPACC and the actual students and teachers on the regular programmes.

FIGURE 4. Codes for the subcategory "weaknesses of the PPACC" (DEBPR).



As shown in Figure 4, the main weakness of the PPACC is that the programme philosophy and meaning are lost (PYSF). Along these lines, although the participants agree that the PPACC is an essential strategy and venture for the country, they also complain that it has been manipulated to benefit both artists that neither require nor deserve this opportunity and the academic institutions themselves, for whom the approval of the PPACC provided an opportunity for a "profitable business".

In terms of the sociodemographic requirements of the students participating in the programme, there is a clear weakness regarding the special attention that the teachers should have shown to those who came from a different cultural background or who had different learning factors due to their status as nontraditional students; for example, being an adult and needing a specific teaching methodology. Apparently, the Ministries of Education and Culture did not provide proper training for the teachers on the programme.

Other significant weaknesses were the lack of support from the Ministries (of Education and Culture) for the programmes, the delays and irregularities in payment to the institutions, and the small number of posts appointed at the different universities to coordinate and manage the PPACC.

In the subcategory "strengths of the PPACC" (FORPR), there are three codes that are directly connected to good management and assertiveness in implementing the PPACC within the different academic programmes: "comprehension and commitment to recognition and curricular flexibility", "ease of selecting the work team" (SETR) and "same teaching staff as on the regular programme" (MDPR).

These strengths relate to the institutions' commitment to curricular adaptation and flexibility. Also to the advantage for the PPACC of having teachers that were not only highly qualified in their educational field but who also were very knowledgeable about the academic programme they were offering. And this because, before becoming part of the PPACC, they had, at least, two or three years of teaching experience on the regular programme; in other words, they had in-depth knowledge of the curriculum. This favoured the adaptation of the content according to the group of students being taught.

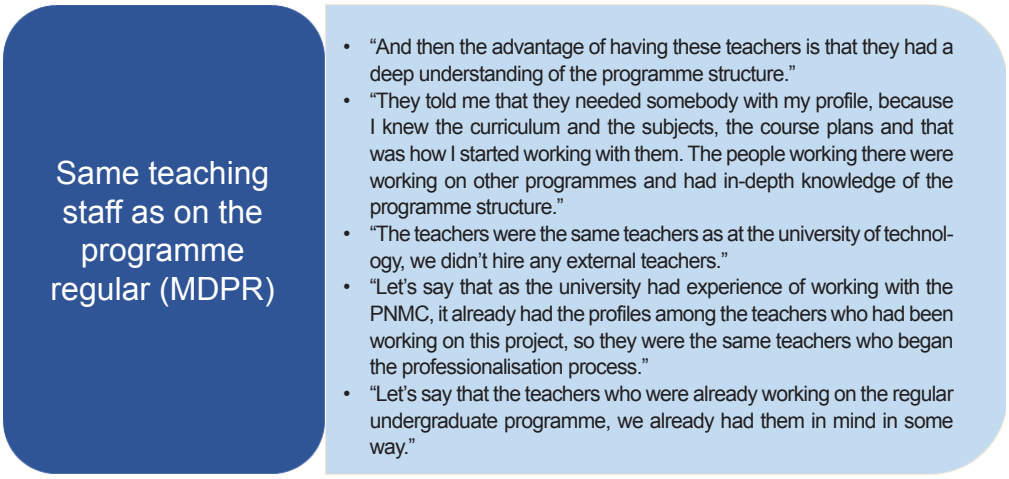
FIGURE 5. References for the code "comprehension and commitment to recognition and curricular flexibility".

Comprehension and commitment to recognition and curricular flexibility (CRF)	• "I think the most important strength is that we took it on responsibly, that we did not improvise, we got down to the task, because I do remember it very well, the task of looking at the curricular part and deciding on the materials and how they were to be used according to the guidelines because they had to be adapted. And we managed it!" • "It was good for everyone, wasn't it? In other words, the university did it very well and thought it through well. There were some strikes, in fact, but there were also options available for when that happened. For example, we could go to a hotel in the centre of the town of Bucaramanga, where the university also had a centre and the classes could be held there." • "We had a team of teachers who understood this project, that this was not a battle of egos or about who knew the most but rather a matter of sharing, 'I know and you know, let's understand and share our knowledge'."

FIGURE 6. References for the code "ease of selecting the work team" (SETR).

Ease of selecting the work team (SETR)	• "When they asked me, 'Do you want to join this madness?', I set out a few conditions, 'if I am allowed to choose the team, I will, BECAUSE THERE ISN'T ROOM FOR ALL OF US HERE'. Not because they don't know, but because, apart from possessing knowledge in cognitive terms, it is necessary to adopt a position that is procedural and ATTITUDINAL." • "They weren't teachers recruited at the last minute to cover posts." • "I knew many of them because they had been my students in the past." • "Somebody was in charge of finding all the teaching profiles for that." • "It was not a large teaching staff." • "On the programme committee we talked about what type of teachers we wanted. Some of those on the programme were very good but others seemed not to want the programme to run, so we didn't call those ones; in other words, you don't call somebody to come and work with you if they don't want to work with you."

FIGURE 7. References for the code "same teaching staff as on the programme regular" (MDPR)



No significant differences were found among the participating universities, with reference to the weaknesses, difficulties and strengths of the PPACC. On the contrary, all of them presented different aspects that they had in common in the three analysis dimensions.

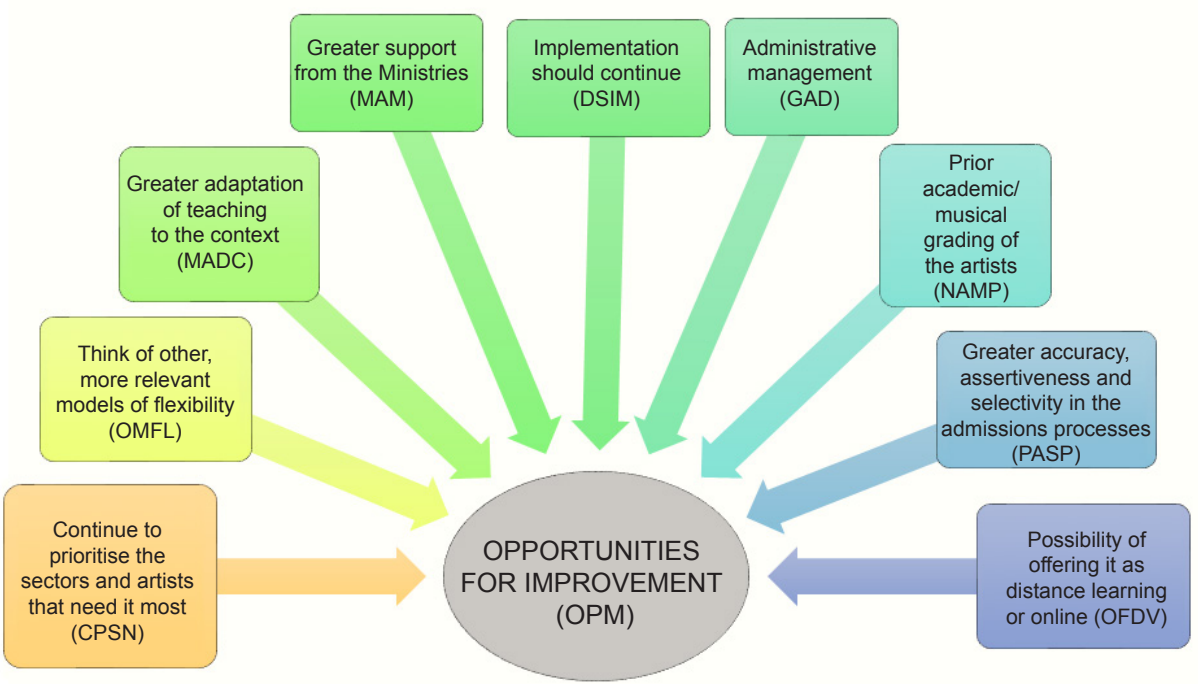
5.2. 5.2. Category "opportunities for improvement" (OPM)

In this category there are nine codes, which characterise the opinion of the PPACC managers, coordinators, teachers and graduates about the recommendations and expectations regarding the improvement of the programme in future stages of implementation. The codes associated with this category are shown in Figure 8.

Along these lines, the participants agree on the necessity of the Ministries becoming more involved in the processes and providing real support to the institutions, before, during and after the implementation of the programme (MAM). Here they indicate, for example, the need to evaluate the academic and management processes and to monitor the graduates to discover their level of satisfaction and the real impact of the PPACC on their lives.

The interviewees also agree that is it essential for the admissions processes (PASP) to involve greater accuracy, assertiveness and selectivity. They are convinced that the PPACC has been such a necessary and successful strategy for the country that it should continue to be

FIGURE 8. Codes for the category "opportunities for improvement" (OPM).



implemented (DSIM). However, they indicate that strict modifications need to be made to the way administrative management is conducted.

Lastly, partly as a result of the whole experience of Covid-19, teachers and artists also indicate that an opportunity for improvement is offering this professionalisation online and as distance learning, thereby continuing to give priority to the sectors and artists that most need it, reaching as far as their regions. This would involve taking the university to more disadvantaged settings, making the programme more equitable.

6. Discussion

The study conducted with the agents involved in the different processes for implementing the PPACC defined results that, in accordance with Giraldo et al. (n.d.) and Melo-Becerra et al. (2017), confirm the PPACC as a necessary and relevant learning pathway in the national context of Colombia, as it provides appropriate answers to several questions and needs raised by the professional sector of music artists.

Nevertheless, there is the fact that academic institutions lack inducements for teachers to work with the nontraditional population. This, as stated by Abramo *et al*. (2019), could be a sign that, although adult education plays a fundamental role at present, in Latin America, there is a generalised absence of university courses or bachelor's degrees that focus on training for trainers of adults, which is exportable to bachelor's degrees focusing on music in this country. This fact is worthy of special attention, considering that, as indicated by Fernie *et al*. (2013), Lee *et al*. (2020) and Tucker and Morris (2011), apart from the administrative regulations and the efforts to make curricula more dynamic and flexible and to adapt them to the relevant contexts, the launch of the PPACC and its success is primarily due to the teachers and the teaching processes.

Despite the firm commitment and teacher engagement in all of the institutions evaluated, a lack of flexibility was observed in professional practices, as was a shortage of intercultural competencies (Taylor et al., 2016) as regards some teachers, mainly in areas related to musical language (piano, history of music, grammar, music theory, analysis and composition). This partly hindered dialogue, reflection, development of critical thinking and the implementation of contextualised teaching/learning practices (Bovil & Woolmer, 2018; Gerbic, 2011; Jonker et al., 2020).

Perhaps this is where further research is needed into how to improve the necessary involvement of teachers on a programme where their participation is crucial and that requires a different vision of music education in higher education. Regarding what has already been stated by Cárdenas and Lorenzo (2013a) and Cárdenas *et al*. (2015) with reference to Colombian music education in the HEIs, there are parallels with the PPACC, where the political administration of the programme, both in universities and in the Ministries of Education and Culture, is not sufficiently flexible to involve the teachers' interest in being part of the processes of designing and modifying the curricula. This implies an almost structural weakness that should be corrected through the participation of all the groups involved in the programme and greater involvement of the teaching staff in institutional management processes and university management posts.

Finally, at an administrative level, the weaknesses of the PPACC include the lack of graduate monitoring, which is an ongoing issue in the Colombian higher education system and internationally, and the minimal or almost non-existent evaluation of the programme. To this effect, the root of this problem lies in the limited culture of curricular evaluation in the country and, again, the lack of support and intervention by the Ministries of Education and Culture after signing the contracts and agreements regarding the programme development with each university.

7. Conclusions

The PPACC was established as a meeting point and a space for the dialogue of knowledge, which, as indicated by Cabarcas et al. (2018), Stanton (2018) and Zapata and Niño (2018), has consolidated its position as the first real attempt, with all its successes and failures, to change the paradigms of music education in the country. Also to construct a space for critical and intercultural pedagogical/musical training for music professionals who have not had the opportunity to enrol in formal institutions to pursue or complete their studies.

Based on the perspective of programme evaluation and in the light of the results of this study, in terms of its implementation on the different professional music programmes involved, it can be said that, overall, the processes have been effective, relevant and satisfactory. A perspective that has been greatly enhanced by the teachers' skill and effectiveness and their extensive

knowledge and experience of the corresponding curricula that they teach.

Regarding the academic processes, the most successful are planning for teaching/learning, selection and preparation of disciplinary content, design of teaching methodologies and organisation of activities, assertive communication, the good relationship with students, and tutoring and evaluation, with the work of the teaching team being one of the most significant strengths of the PPACC.

Obviously, with such a complex programme, held nationally and with the added difficulty of integrating students regionally, it was to be expected that there would be shortcomings. However, these have been balanced by the mid- and long-term benefits for Colombia of providing a way to return to employment for music professionals who represent a sector that has great importance for the country's cultural and economic activity.

In accordance with the experience and learning related to the flexibility of the curricula involved, there is a need for the HEIs to create new spaces for reflection and dialogue in the interest of readapting and co-creating the curricula and processes for the country's higher education in music, so that they are relevant and contextualised, and truly meet Colombia's needs. Lorenzo et al. (2023) made this clear in recent works on higher level music qualifications in Colombia and it can be applied to the PPACC, as the teachers are the same in both cases.

Lastly, both the results of this research and the experience itself of fourteen years of implementing the PPACC in this country can be used as a sound, theoretical and empirical basis for arranging similar processes in other regions or countries. As indicated by the Ministry of Culture (2015), this public policy has taken shape as an unprecedented strategy, not only in this country but also in the context of Latin America, where there are no similar arts education processes.

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References

Abramo, L, Cecchini, S., & Morales, B. (2019). *Programas sociales, superación de la pobreza e inclusión laboral: aprendizajes desde América Latina y el Caribe [Social programmes, overcoming poverty and labour inclusion: Lessons from Latin America and the Caribbean].* Comisión Económica para América Latina y el Caribe (CEPAL).

Andersson, P., & Fejes, A. (2005). Recognition of prior learning as a technique for fabricating the adult learner: A genealogical analysis on Swedish adult education policy. *Journal of Education Policy*, *20* (5), 595-613. https://doi.org/10.1080/02680930500222436

Anguera, M. (2008). Evaluación de programas desde la metodología cualitativa [Program evaluation from qualitative methodology]. *Acción Psicológica*, *5* (2), 87-101. http://e-spacio.uned.es/fez/view/bibliuned:AccionPsicologica2008-2-0005

Arenas, E. (2011, 13-16 July). *Utopías de la educación musical en Colombia: dilemas y conflictos de representaciones [Utopias of music education in Colombia: Dilemmas and conflicts of representations]* [ponencia]. VI Congreso Nacional de Música, Medellín, Colombia.

Aróstegui, J., & Kyakuwa, J. (2021). Generalist or specialist music teachers? Lessons from two continents. *Arts Education Policy Review*, *122* (1), 19-31. https://doi.org/10.1080/10632913.2020.1746715

Barbero, M.ª I., Vila, E., & Falcón, J. C. (2003). *Psicometría [Psychometry].* Universidad Nacional de Educación a Distancia.

Bauselas, E. (2004). Una herramienta al servicio de perfeccionamiento docente: Nudist Vivo [A tool at the service of teacher training: Nudist Vivo]. *Revista de Informática Educativa y Medios Audiovisuales*, *1* (3), 21-27.

Bazeley, P. (2002). The evolution of a project involving an integrated analysis of structured qualitative and quantitative data: From N3 to NVivo. *International Journal of Social Research Methodology*, *5* (3), 229-243. https://doi.org/10.1080/13645570210146285

Bovil, C., & Woolmer, C. (2018). How conceptualisations of curriculum in higher education influence student-staff co-creation in and of the curriculum. *Higher Education*, *78*, 407-422. https://doi.org/10.1007/s10734-018-0349-8

Burnard P. (1991). A method of analysing interview transcripts in qualitative research. *Nurse education today*, *11* (6), 461-466. https://doi.org/10.1016/0260-6917(91)90009-y

Cabarcas, M., Barrios J., Lemus, J., & Vergara, L. (2018). Perspectivas interculturales en la escuela latinoamericana: empoderar el diálogo para superar la exclusión [Intercultural perspectives in the Latin American school: Empowering dialogue to overcome exclusión]. *Polyphõnia. Revista de Educación Inclusiva*, *2* (1), 100-117. https://www.aacademica.org/polyphnia.revista.de.educacion.inclusiva/25

Cárdenas, R. N., & Lorenzo, O. (2013a). Evaluación de programas de enseñanza musical superior en Colombia [Evaluation of higher music education programmes in Colombia]. En Y. Pedraza, & Ó. Pulido (Eds.), *Congreso de Investigación y Pedagogía III Nacional II Internacional. La educación en el siglo XXI: ser, saber y producir en la incertidumbre y el caos [Congress of Research and Pedagogy III National II International. Education in the 21st century: Being, knowing and producing in uncertainty and chaos]* (pp. 830-840). Universidad Pedagógica y Tecnológica de Colombia.

Cárdenas, R. N., & Lorenzo, O. (2013b). Estudio sobre características profesionales de los docentes de licenciaturas en música en Colombia [Study about professional features of music education programs' teachers in Colombia]. *Educación XX1*, *16* (2), 161-182. https://doi.org/10.5944/educxx1.2.16.10337

Cárdenas, R. N., Lorenzo, O., & Hargreaves, D. (2015). The training of music teachers in Colombia: A descriptive analysis. *International Journal of Music Education*, *33* (1), 3-17. https://doi.org/10.1177/0255761413515807

Casas, M. (2015). Formación superior de educadores musicales: a propósito de los 20 años de la ley 115 de 1994 [Higher education for music educators: On the occasion of the 20th anniversary of Law 115 of 1994]. *Ricercare*, (4), 8-18. https://doi.org/10.17230/ricercare.2015.4.1

Corrigall, K., & Trainor, L. (2011). Associations between length of music training and reading skills in children. *Music Perception*, *29* (2), 147-155. https://doi.org/10.1525/mp.2011.29.2.147

Cremades-Andreu, R., & García-Gil, D. (2017). Musical training of the degree in primary education in the context of Madrid. **Revista Española de Pedagogía**, *75* (268), 415-431.

Creswell, J. W. (2003). Research design: Qualitative, quantitative, and mixed methods approaches (2nd ed.). Sage.

Cho, J. Y., & Lee, E. (2014). Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *The Qualitative Report*, *19* (32), 1-20. https://doi.org/10.46743/2160-3715/2014.1028

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, *64*, 135-168. https://doi.org/10.1146/annurev-psych-113011-143750

Dias, J. (2007). Acreditación de la educación superior en América Latina y el Caribe. La educación superior en el mundo [Accreditation of higher education in Latin America and the Caribbean. Higher education in the world]. In B. C. Sanyal, & J. Tres (Eds.), *La educación superior en el mundo 2007. Acreditación para la garantía de la calidad: ¿qué está en juego? [Higher education in the world, 2007. Accreditation for quality assurance: What is at stake?]* (pp. 282-295). Mundi Prensa Libros. https://upcommons.upc.edu/bitstream/handle/2099/7538/18_282-295.pdf

Dias, J. (2014). Universidade e novos modos de produção, circulação e aplicação do conhecimento [University and news modes of production, circulation and application of knowledge]. *Avaliação, Campinas; Sorocaba, SP*, *19* (3), 643-662. https://periodicos.uniso.br/avaliacao/article/view/2055

Díaz, M. (2002). *Flexibilidad y educación superior en Colombia [Flexibility and higher education in Colombia].* Instituto Colombiano Para el Fomento de la Educación Superior (ICFES).

Díaz, C., & Bastías, C. (2012). Una aproximación a los patrones de comunicación entre el profesor mentor y el profesor-estudiante en el contexto de la práctica pedagógica [An approach to communication patterns between teachers and student-teachers in the context of pedagogical practice]. *Educación XX1*, *15* (1), 241-263. https://doi.org/10.5944/educxx1.15.1.158

Drisko, J. (2008). How is qualitative research taught at the master's level? *Journal of Social Work Education*, *44* (1), 85-101. https://doi.org/10.5175/JSWE.2008.200500537

Fernández, N. (2004). Hacia la convergencia de los sistemas de educación superior en América Latina [Towards the convergence of Latin American higher education systems]. *Revista Iberoamericana de Educación*, *35*, 39-71.

Fernie, S., Pilcher, N., & Smith, K. (2013). The Scottish credit and qualifications framework: What's academic practice got to do with it? *European Journal of Education*, *49* (2), 233-248. https://doi.org/10.1111/ejed.12056

Folkestad, G. (2006). Formal and informal learning situations or practices vs formal and informal ways of learning. *British Journal of Music Education*, *23* (12), 135-145. https://doi.org/10.1017/S0265051706006887

Gerbic, P. (2011). Teaching using a blended approach - what does the literature tell us? *Media International*, *48* (3), 221-234. https://doi.org/10.1080/09523987.2011.615159

Giraldo, U., Abad, D., & Díaz, E. (s.f.). *Bases para una política de calidad de la educación superior en Colombia [Bases for a quality policy for higher education in Colombia].* Recuperado el 14 de enero de 2024 de https://www.mineducacion.gov.co/CNA/1741/articles-186502_doc_academico10.pdf

Gómez, V., & Celis, J. (2009). Crédito educativo, acciones afirmativas y equidad social en la educación superior en Colombia [Student loans, affirmative action, and social equity in Colombian higher education]. *Revista de Estudios Sociales*, *1* (33), 106–117. https://doi.org/10.7440/res33.2009.09

Green, L. (2002). *How popular musicians learn. A way ahead for music education*. Routledge.

Green, L. (2008). *Music, informal learning and the school: A new classroom pedagogy*. Aldershot.

Guhn, M., Emerson, S. D., & Gouzouasis, P. (2020). A population-level analysis of associations between school music participation and academic achievement. *Journal of Educational Psychology*, *112* (2), 308-328. https://doi.org/10.1037/edu0000376

Guzmán-Valenzuela, C. (2017). Tendencias globales en educación superior y su impacto en América Latina: desafíos pendientes [Global trends in higher education and their impact on Latin America: Pending challenges]. *Lenguas Modernas*, (50), 15-32.

Herrera, M., e Infante, R. (2003). Las políticas públicas y su impacto en el sistema educativo colombiano. Una mirada desde los planes de desarrollo 1970-2002 [Public policies and their impact on the Colombian educational system. A look from the 1970-2002 development plans]. *Nómadas*, (20), 76-85.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative health research*, *15* (9), 1277-1288. https://doi.org/10.1177/1049732305276687

Hyland, K. (2013). Writing in the university: Education, knowledge and reputation. *Language teaching*, *46* (1), 53-70. https://doi.org/10.1017/S0261444811000036

Jonker, H., März, V., & Voogt, J. (2020). Curriculum flexibility in a blended curriculum. *Australasian Journal of Educational Technology*, *36* (1), 68-84. https://ajet.org.au/index.php/AJET/issue/view/137

Kashif, M., & Cheewakrakokbit, P. (2017). Perceived service quality-loyalty path: A PAKSERV based investigation of international students enrolled in business schools in Thailand.. *Journal of Marketing for Higher Education*, *28* (1), 51-65. https://doi.org/10.1080/08841241.2017.1402113

Langa, D., & David, E. (2006). A massive university or a university for the masses? Continuity and change in higher education in Spain and England. *Journal of Education Policy*, *21* (3), 343-365. https://doi.org/10.1080/02680930600600630

Lee, K.-H., Na, G., Song, C.-G., & Jung, H.-Y. (2020). How does pedagogical flexibility in curriculum use promote mathematical flexibility? An exploratory case study. *Mathematics*, *8* (11), 1987. https://doi.org/10.3390/math8111987

López-León, R., Lorenzo-Quiles, O., & Addessi, A. R. (2015). Music education in Puerto Rican elementary schools: A study from the perspective of music teachers. *International Journal of Music Education*, *33* (2), 146-162. https://doi.org/10.1177/0255761413515811

Lorenzo, O. (2011). Análisis cualitativo de textos sobre multi e interculturalidad [Qualitative analysis of texts about multi- and interculturality]. *DEDiCA Revista De Educação E Humanidades (dreh)*, (1), 535–546. https://doi.org/10.30827/dreh.v0i1.7186

Lorenzo, O., Cárdenas, R. N., Soares-Quadros, J. F., & Ortiz-Marcos, J. M. (2023). Curriculum and training analysis of the music degrees in Colombia. *International Journal of Music Education*. https://doi.org/10.1177/02557614231152310

Lorenzo, O., & Turcu, I. R. (2023). Higher music education in Romania in the context of the European Higher Education Area: An analysis from the lecturer's perspective. *Music Education Research*, *25* (2), 147-159. https://doi.org/10.1080/14613808.2023.2183493

Mayring, P. (2000). Qualitative content analysis. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *1* (2). https://doi.org/10.17169/fqs-1.2.1089

McAleavy, G., & O'Hagan, C. (2003). Deepening participation and progression through the recognition of vocational learning. *Journal of Widening Participation and Access*, *5* (2), 30-53.

Melnic, A., & Botez, N. (2014). Formal, non-formal and informal interdependence in education. *Economy Transdisciplinarity Cognition*, *17* (1), 113-118.

Melo-Becerra, L., Ramos-Forero, J., & Hernández-Santamaría, P. (2017). Higher education in Colombia: Current situation and efficiency analysis. *Revista Desarrollo y Sociedad*, (78), 59-111. https://doi.org/10.13043/DYS.78.2

Ministerio de Cultura de Colombia. (2015). *Encuentro Nacional de Colombia Creativa [National Meeting of Colombia Creativa]*. Ministerio de Cultura de Colombia. https://www.mincultura.gov.co/areas/artes/educacion-artistica/colombia-creativa/Documents/Memorias%202015%20Colombia%20Creativa%205%20y%206%20noviembre%202015.pdf

Ministerio de Cultura de Colombia, & ACOFARTES (2010). *Sistematización de la experiencia del proyecto Colombia Creativa. Memoria (fase I) [Systematisation of the experience of the Colombia Creativa project. Report (stage I)]*. Ministerio de Cultura de Colombia.

Ministerio de Cultura de Colombia, & ACOFARTES. (2011). *Informe final: fase II. Sistematización de la experiencia del proyecto Colombia Creativa [Final report: stage II. Systematisation of the experience of the Colombia Creativa project]*. Ministerio de Cultura de Colombia.

MEN (Colombian Ministry of Education). (2014). *Educación superior en Colombia [Higher education in Colombia)*. https://www.mineducacion.gov.co/portal/Educacion-superior/

Ñáñez-Rodríguez, J. J., & Castro-Turriago, H. M. (2016). Educación artística y formación ciudadana: espacio para forjar la sensibilidad en la Corporación Colegio San Bonifacio, de Ibagué, Colombia [Arts education and citizenship training: a space for forging sensitivity in the San Bonifacio School Corporation, Ibagué, Colombia]. *Entramado*, *12* (2), 154-165. https://doi.org/10.18041/1900-3803/entramado.2.441

Quintana, A. (2006). Metodología de investigación científica [Scientific research methodology]. In A. Quintana, & W. Montgomery (Coords.), *Psicología: tópicos de actualidad [Psychology: current topics]* (pp. 47-84). Universidad Nacional Mayor de San Marcos.

Rodríguez, M. (2015,October 5-9). *Educación musical en Colombia: entre el impulso a debilitar y el impulso a ampliar [Music education in Colombia: Between the impulse to weaken and the impulse to expand]*. XXII Congresso Nacional da ABE, Natal, Brasil.

Rodríguez, M. (2016, August 4-7). *Tensiones de la educación musical escolar en Colombia [Tensions in Colombian school music education]* [conferencia]. X Conferencia Regional Latinoamericana y III Conferencia Regional Panamericana de Educación Musical de la ISME - Sociedad Internacional de Educación Musical. Pontificia Universidad Católica de Lima, Lima, Perú.

Romeu-Fontanillas, T., Guitert, M., Raffaghelli, J. -E., & Sangrà, A. (2020). Ecologías de aprendizaje para usar las TIC inspirándose en docentes referentes [Mirroring learning ecologies of outstanding teachers to integrate ICTs in the classroom]. *Comunicar*, (62), 31-42. https://doi.org/10.3916/c62-2020-03

Sala, G., & Gobet, F. (2017). When the music's over. Does music transfer to children's and young adolescents' cognitive and academic skills? A meta-analysis. *Educational Research Review*, *20*, 55-67. https://doi.org/10.1016/j.edurev.2016.11.005

Sánchez-Escribano, E., Gertrudix, F., & Bautista, A. (2022). Analyzing instrumental music education models: A four-dimension tool. *Arts Education Policy Review*. https://doi.org/10.1080/10632913.2022.2041139

Sangrá, A., Raffaghelli, J., González-Sanmamed, M., & Muñoz-Carril, P. (2021). Desarrollo profesional de maestros de primaria desde la óptica de las ecologías de aprendizaje: nuevas formas de actualizarse en tiempos inciertos [Primary school teachers' professional development through the learning ecologies lens: New ways for keeping up to date in uncertain times]. *Publicaciones*, *51* (3), 21-45. https://doi.org/10.30827/publicaciones.v51i3.20790

Santaella, C. (2016). Estrategias para resistir a la crisis de confianza en la investigación cualitativa actual [Strategies to resist the current confidence crisis in qualitative research]. *Educación XX1*, *19* (1), 159-177. https://doi.org/10.5944/educxx1.15582

Souto-Seijo, A., Estévez, I., & Sande, O. (2021). Opportunities for teacher training: An approach from the learning ecologies. *Educatio Siglo XXI*, *39* (2), 61-79. https://doi.org/10.6018/educatio.463211

Stanton, B. (2018). Musicking in the borders: Toward decolonizing methodologies. *Philosophy of Music Education Review*, *26* (1), 4-23. https://doi.org/10.2979/philmusieducrevi.26.1.02

Taylor, R., Yeboah, A. K., & Ringlaben, R. P. (2015). Pre-service teachers' perceptions towards multicultural education and teaching of culturally and linguistically diverse learners. *International Journal for Innovation Education and Research*, *3* (9), 75-87. https://doi.org/10.31686/ijier.vol3.iss9.434

Tejada, J., & Thayer, J. (2019). Design and validation of a music technology course for initial music teacher education based on the TPACK model and the project-based learning approach. *Journal of Music, Technology, and Education*, *12* (3), 225-246. https://doi.org/10.1386/jmte_00008_1

Tucker, R., & Morris, G. (2011). Anytime, anywhere, anyplace: Articulating the meaning of flexible delivery in built environment education. *British Journal of Educational Technology*, *42* (6), 904-915. https://doi.org/10.1111/j.1467-8535.2010.01138.x

Wang, F., & Lorenzo, O. (2018). Sociedad y educación musical en educación primaria en China [Society and musical education in primary education in China]. *Publicaciones*, *48* (2), 359-399. https://doi.org/10.30827/publicaciones.v48i2.8350

Zapata, G., & Niño, S. (2018). Diversidad cultural como reto a la educación musical en Colombia: problemas relacionales entre culturas musicales, formación e investigación de la música [Cultural diversity as a challenge to music education in Colombia: Inter-relational issues in musical cultures, education and research]. *Cuadernos de Música, Artes Visuales y Artes Escénicas*, *13* (2), 227-236. https://revistas.javeriana.edu.co/index.php/cma/article/view/9_ZapataNi%C3%83%C2%B1o

Zwiers, M., & Morrissette, P. J. (1999). *Effective interviewing of children: A comprehensive guide for counselors and human service workers*. Taylor & Francis. https://doi.org/10.4324/9780203768303

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Studies

Efficacy indicators for ICT addiction prevention: a case study of *Clickeando*

Indicadores de eficacia de la prevención de la adicción a las TIC: Clickeando, *estudio de caso*

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Abstract:

There are few programmes for preventing ICT addiction, and even fewer that have been scientifically validated. Preventing ICT addiction is a key part of governments' adolescent mental health policies. *Clickeando* is a school programme for universal prevention of ICT addiction in adolescents. It has been in use for fourteen years and was designed on the basis of the appropriate quality indexes for this type of programme. Since 2020, *Clickeando* has assessed its participants with the aim of linking the efforts of different preventive bodies and agents. This has enabled the present study to assess the programme's impact on its target population. The main results indicate that the programme produces changes in ICT use, principally by reducing addictive use of mobile phones by girls and boys in secondary education. Likewise, there are important behaviours in the development of addictive patterns that we suggest should be the focus of future modifications to the workshop (such as time spent on social networks or on instant messaging systems), for they are crucial for the efficacy of the intervention. The effects of Covid-19 on young people's mental health have highlighted the need for assessment protocols and preventive actions that foster healthy use of technology and that take into account age and the gender perspective in their implementation to maximise their efficacy.

Keywords: addiction, technology, ICT, mobile phones, social networks, video games, school-based prevention, prevention programme, mental health, efficacy, validation, adolescence, Covid-19, factor analysis.

Resumen:

No existen muchos programas de prevención de adicción a las TIC y menos todavía validados científicamente. Prevenir la adicción a las TIC es clave en las políticas gubernamentales de salud mental de los adolescentes. *Clickeando* es un programa escolar de prevención universal de la adicción a las TIC para adolescentes. Lleva realizándose catorce años y ha sido diseñado con base en los índices de calidad destacados para esta clase de programas. Desde 2020, *Clickeando* evalúa a sus participantes con el fin de vincular los esfuerzos de organismos y agentes preventivos, lo que ha permitido valorar los efectos del programa en su población objetivo en el presente estudio. Los principales resultados indican que el programa logra producir cambios en el uso de las TIC, principalmente a través de la disminución del uso adictivo del móvil tanto en chicas como chicos de secundaria. A su vez, existen conductas con un importante peso en el desarrollo de patrones adictivos que se sugiere tener como objetivo en futuras modificaciones del taller (como el tiempo invertido en las redes sociales o en los sistemas de mensajería instantánea), pues resultan decisivas para la eficacia de la intervención. Las secuelas del Covid-19 en la salud mental de la juventud ha puesto de relieve la necesidad de contar con protocolos de evaluación y actuaciones preventivas que fomenten el uso saludable de la tecnología. Uno y otras, además, deberán considerar la edad y la perspectiva de género en su implementación para maximizar su eficacia.

Palabras clave: adicción, tecnología, TIC, móvil, redes sociales, videojuegos, prevención escolar, programa prevención, salud mental, eficacia, validación, adolescencia, Covid-19, análisis factorial.

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1. Introduction

In the present digital age, information and communication technologies (ICT) play a central role in the psycho-social spheres (personal, social, and school) of adolescents (the age group ranging from 10 to 18 years) (Gentry & Campbell, 2002; Chóliz, 2017). As a result of the Covid-19 lockdowns, adolescents greatly increased their consumption of technology (Masaeli & Harhadi, 2021), putting them at greater risk of developing an ICT addiction (Kuss et al., 2013). In Spain, almost all young people aged from 10 to 12 years have access to a smartphone (Anderson & Jiang, 2018), while 23.5% of adolescents aged from 14 to 18 present an internet addiction, and 7.1%, a gaming addiction (GA) (Observatorio Español de las Drogas y las Adicciones, 2022).

ICT addiction is defined as a recurrent and pathological pattern of behaviour, characterised by salience, tolerance (progressive increase in time of use), withdrawal (psychological discomfort in the absence of the stimulus), avoiding dysphoric emotions, psychosocial conflicts, relapse, and difficulty controlling ICT consumption (Kuss et al., 2014). The characteristics of technology as a medium and its applications (social networks [SN], gaming, and the internet) have a high addictive potential that results in the development of symptoms similar to those of substance addictions (Soto et al., 2018).

This harm to the mental health of younger generations highlights the need to establish public policies to tackle the problems of ICT addiction, a question that predates Covid-19 (King et al., 2018). Consequently, measures should be put in place that make it possible to delay, reduce, and eliminate the impact of potentially addictive behaviours by strengthening knowledge, attitudes, and behaviours that protect adolescents' mental health (Romano & Hage, 2000). When we speak of this need, we refer to prevention, as this has shown itself to be an effective approach to the reduction of addictive ICT use among adolescents when implemented through public policies (American Psichological Association [APA], 2014; Kaess et al., 2016). Specifically, the utility of school universal prevention programmes targeted at secondary-school students has been highlighted (Gainsbury & Blaszczynski, 2011; Prats et al., 2018). However, if they are to be effective, these programmes must be specific, evidence-based and designed using defined standards; work on risk and protection factors (Berrios et al., 2020); and include instruments to assess the intervention (Throuvala et al., 2019) and early detection in users (García-Couceiro et al., 2021).

Our specific object of study is the universal ICT addiction prevention programme for secondary education *Clickeando*. This programme focusses on students aged from 10 to 14 and their school and family context (Sánchez et al., 2018). As well as the two versions for students (obligatory secondary education [ESO] and primary education), it features workshops for family members and teachers. Its principal objective is to inform, raise awareness, and modify behaviour involving misuse of technology (both excessive use and inappropriate use) such as loss of privacy or cyberbullying (Echeburúa & De Corral, 2010). Valencia's Plan Municipal de Drogodependencias (Municipal Drug Dependency Plan) has used *Clickeando* for fourteen years in educational centres. However, despite its longevity and the quality of its design, the students were not assessed in the procedure until 2020.

Therefore, the present work focuses on the population of *Clickeando* participants and on the effects of the programme. To do so, it will address two fundamental issues in the design of effective ICT addiction prevention programmes. Firstly, work on this type of prevention tends to centre on risk factors such as time of use or the age of participants (Throuvala et al., 2019). Nonetheless, gender is a risk factor that, despite its relevance in the development of social networks addition (SNA) and gaming addiction (GA) (Andreassen et al., 2016), is not usually included in the prevention actions of these programmes (Yudes et al., 2019).

The second is the lack of consensus regarding ICT addiction terminology (Berrios et al., 2020; King et al., 2018). Terms such as *pathological*, *problematic*, or *compulsive* use, or *abuse*, *dependency*, and *addiction* are used interchangeably in the literature to refer to the same concept. We understand that pathological use of ICT results in symptoms of addiction. Therefore, we will use the concept *addictive use* to refer to the presence of symptoms of addiction without establishing a disorder, as our methodology is based on detection and not diagnosis.

Furthermore, *ICT* is a very broad and ambiguous concept if the elements that might generate an addictive behaviour are not specified (for example, screen addiction) (Bhargava & Seshadri, 2021). In this study, ICT addiction comprises mobile phone addiction (MPA) (such as uncontrolled, inappropriate, or excessive

use that creates social, behavioural, and affective problems; Chóliz, 2010), SNA (such as compulsive and problematic use that causes a significant impairment of everyday functioning over a long period of time) (Van den Eijnden et al., 2016), and GA (such as persistent and recurrent use that displays symptoms of preoccupation, withdrawal, tolerance, lack of control, loss of interest in other activities, psychosocial consequences, deception about amount of time spent, losing opportunities or relationships, and gaming to relieve negative moods) (American Psychiatric Association [APA], 2013).

There is an international need to address ICT addiction in adolescence by means of prevention programmes of a psychosocial nature through public policies (King et al., 2018), which is part of the United Nations' sustainable development goal (SDG) 3 relating to good health and well-being. This article is the result of the desire to provide the educational community with a useful resource that makes it possible to work on this aspect that feeds the crisis in young people's mental health that we are facing: adolescents' relationship with their virtual context (Bashir & Bhat, 2017). Its main aim is to provide evidence about changes in participants' behaviour relating to ICT resulting from *Clickeando*. To do so, we will analyse (1) participants' patterns of use and prevalence of addictive behaviour towards ICT, (2) which behavioural aspects of ICT use promote addictive use, (3) what effects the workshop has on these behaviours, and (4) whether these differ between male and female participants.

2. Methodology

2.1. Participants and procedure

The sample comprised participants selected from the *Clickeando* workshop (Table 1) through purposive non-probability sampling during the 2021-2022 academic year. The design of the experiment was based on assessments before the start of the programme (pre-test) and one month after its completion (post-test). These assessments were matched by participants by means of a unique identification code that complied with both the regulations of the Ethics Committee of the Universidad de Valencia regarding personal data processing and with the rules of the Helsinki Declaration (2013).

The total sample included all of the participants from secondary education who completed the workshop and all of the questionnaires (N = 645, M_{age} = 12.36, girls = 45%, boys = 55%, year one of ESO = 74%, year 2 of ESO = 26%). A sub-sample was also selected comprising only the participants matched in the pre-post assessments (n = 322, M_{age} = 12.22, girls = 51.9%, boys = 48.1%, year 1 of ESO = 83.2%, year 2 of ESO = 16.8%).

TABLE 1. Design and structure of the *Clickeando* workshop for ESO

Elements of the programme			Structure of the programme
Prevention level	Universal: prevention prior to appearance of the problem.		Module 1: Introduction (1 hour) Week 1
Target population	Male and female students from years 1 and 2 of ESO in the centres participating in the programme.		1.1. Advantages of technology 1.2. Disadvantages of technology 1.2.1 Physical drawbacks 1.2.2 Social drawbacks 1.2.3. Technological drawbacks
Users' needs	Having knowledge and clear guidelines about the positive use and negative effects of ICT while learning to use it.		Module 2: Problems with inappropriate intra- and interpersonal use (1 hour)
Objectives	General	Preventing addictive use of ICT and risk behaviours. Promoting healthy use.	2.1. Privacy with ICT 2.2. Grooming 2.3. Sexting 2.4. Cyberbullying
	Specific	Identifying advantages and drawbacks of ICT and risk behaviours. Differentiating between good and bad uses of ICT. Improving online safety and privacy. Avoiding the negative influence of ICT in psycho-social spheres (classroom, home, and friendships). Promoting non-virtual leisure. Analysing offline effects of ICT. Improving personal competences and resources.	

Theoretical framework	Preventive treatment of behavioural addictions (Mora et al., 2015)	Module 3: ICT addiction (1 hour) Week 2
Strategies	Participatory: critical thinking, social skills, emotional management and intelligence. Informational: up-to-date knowledge of the harmful effects of ICT. Formative: identifying problem areas, how to act inside and outside ICT.	3.1. Types of ICT addiction 3.2. Identifying the signs of addiction 3.3. Process of development of the addiction 3.4. Guidelines for action
Activities	Group work through activities in class (e.g., role-playing), discussions (e.g., why do we get hooked on ICT?), or watching videos (e.g., short films on cases of ICT addiction, extracts from documentaries or music videos).	
Timeline	September: circulation of the programme to the schools and opening of the agenda. October-May: Delivery of the workshops by specialists in the centres in order of demand. June-July: analysis of data by centre, educational and community level, and preparation of reports for the bodies involved.	
Community resources	A public activity done in a space in the school centres with technological resources the enable the use of audiovisual resources.	
Assessment	The assessment is done in the first session and one month after completing the workshop. Its aims are (1) to detect cases of risk or consolidated cases, (2) to link the intervention services on the problem of ICT addiction at a school and municipal level, as much as (3) to obtain evidence about the functioning of the workshop and propose improvements to it	

Note: the outline of the characteristics of the programme is based on the descriptive format documented by Espinel and Leguizamón (2022). The content of the *Clickeando* workshop for compulsory secondary education is taken from Sánchez et al. (2018).

2.2. Instruments

2.2.1. TecnoTest (Marcos & Chóliz, 2021)

ICT addiction screening instrument comprising twenty-four dichotomous questions (yes/no). This test consists of four scales comprising six items that detect whether an ICT addiction behaviour (mobile phone, SN, and gaming) is independently present (α_{mobile} = .92, α_{SN} = .72, α_{gaming} = .81). Each scale determines the degree of addiction by adding three items with predictive value (mobile phone: 3, 4, 20; SN: 5, 7, 14; gaming: 6, 8, 19). The final scores define cases of non-problematic behaviour (0), problematic behaviour (1), risk behaviour (2), and addictive behaviour (3) in relation to the different forms of ICT.

2.2.2. Ad hoc battery on technology use pattern

This included seven ordinal items to assess weekly frequency of use of SN and gaming, and time spent using them. The frequency item comprised five response levels (1 = Never, 2 = 1-2 times a week, 3 = 3-4 times a week, 4 = 5-6 times a week, 5 = Daily). The time of use was measured on the basis of two different items (time during the week and at the weekend) with a five-point Likert scale (1 = I do not use them, 2 = <1 hour, 3 = 1-2 hours, 4 = 2-3 hours, 5 = ≥ 3 hours).

The last item assessed the time taken to respond to instant messaging (IM) on apps like WhatsApp in different situations (at home, in class, social settings, in bed, and while eating) on a four-point scale (1 = I answer immediately; 2 = I wait a bit, but I try to answer as soon as possible; 3 = I wait as long as I need to answer; 4 = I never answer in this situation). The responses to these items were inverted and added up to give a total score that assessed compulsive use of instant messaging (the faster the response, the more addictive behaviour towards the mobile phone) of up to 20 points (Luján-Barrera & Denís, 2021). The total reliability of the ad hoc scale was α = .769.

Finally, the age, gender (male/female), school, year group, cycle, and nationality of the participants were also recorded.

2.3. Statistical analysis

This study used univariate statistics in SPSS Statistics 28 such as descriptive statistics, frequencies, and *t*-tests between groups and within subjects. We also

calculated the effect size (Cohen's *d* : small ≥.2, medium ≥.5, or large ≥.8). Multivariate analyses were done using IBM SPSS Amos 28 to create factorial model for ICT addiction. For the factor analysis, we used the maximum likelihood estimation method (MLE) and the comparative fit indexes (*CFI* ≥.9–.95) (Van de Schoot et al., 2012), root mean square error of approximation (*RMSEA* <.06–.08) (Kline, 2010), maximum likelihood indexes (χ^2 and χ^2/df), Akaike information criterion (AIC), and Bayesian information criterion (BIC). These last three indicate better fit when their value is lower (Killian et al., 2019). The standardised factor loadings (λ_e) and explained variance (R^2) were also used to analyse the influence of the indicators (λ_e >0.4) within and between the models (Stevens, 2002).

3. Results

3.1. Study of the sample before the programme

3.1.1. General pattern of ICT use

With regards to mean ICT consumption before the programme, the participants used SN for 1-2 up to 2-3 hours per week (school time and holidays). They were online, at least, 5-6 days a week. The exception was gaming, for they played on average only 2-3 days for 1 hour from Monday to Friday and, at least, 1-2 hours on weekends.

In general, the form of ICT with the greatest degree of addiction was the mobile phone: 52.7% had problematic behaviour; 13.5%, risk behaviour; and 3.7%, addictive behaviour (only 28.2% did not display problems). Secondly, there was gaming (normal usage: 70.4%, problematic: 22.6%, risk: 5.3%, addictive: 1.7%), and finally SN (normal: 79.1%, problematic: l 5%, risk: 4.5%, addictive: 1.4%). Clear gender differences were apparent in addictive use of SN (greater in the case of girls) and gaming (greater in the case of boys) (Table 2), while no significant differences were observed regarding use of mobile phones.

With regards to use habits, both genders displayed high SN use, with a mean daily connection of 2 up to 5-6 hours during the week and 3 hours at weekends. However, girls displayed significantly higher addictive behaviour towards SN. As in the general results, addictive use of MP is predominant over other forms of ICT.

TABLE 2. Differences between groups by gender in the initial pattern of use of ICT.

Variables	*M (SD)* Girls (*n* = 290)	Boys (*n* = 355)	*t (df)*	*p*	*CI*	*d*
SN frequency	3.93 (1.379)	3.95 (1.396)	.109 (643)	913	-.204-.228	.009
Gaming frequency	2.16 (1.316)	3.3 (1.304)	10.996 (643)	***	.936-1.344	.87
SNS time DW	2.83 (1.173)	2.82 (1.175)	-.085 (643)	.933	-.190-.175	-.162
SNS time WE	3.61 (1.285)	3.72 (1.29)	1,12 (643)	.263	-.086-.341	-.089
Gaming time DW	1.72 (.985)	2.42 (1.287)	7.78 (640.375)	***	.520-.872	.6
Gaming time WE	2.43 (1.325)	3.94 (1.053)	15.733 (545.72)	***	1.319-1.695	1.274
Compulsive WhatsApp use	10.78 (2.71)	11.12 (3.09)	1.482 (639.725)	.139	-.116-.793	.116
Addictive use of mobile phone	.98 (.795)	.92 (.736)	-.906 (643)	.365	-.173-.064	-.072
Addictive use of SN	.34 (.669)	.23 (.561)	-2.18 (564.829)	*	-.204-(-.011)	-.176
Addictive use of gaming	.31 (.623)	.44 (.696)	2.537 (637.698)	*	.03-.234	.199

Note: SN: social networks; DW: during the week; WE: weekend; IM: instant messaging. *M*: mean; *df*: degrees of freedom; *CI*: confidence interval; *d*: effect size. *Sig.* (two tail): p <.05 (*), p <.01 (**), p <.001 (***).

3.1.2. Definition of the factorial model for measuring addictive behaviour towards ICT

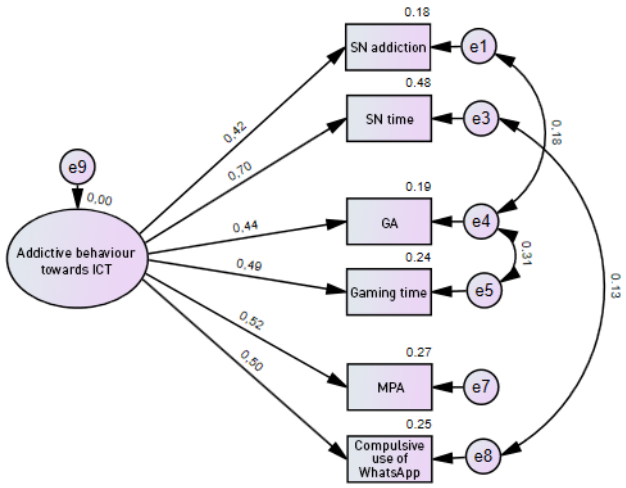
During the development of the factorial model for measuring participants' ICT addiction (Figure 1), two more models were tried, shown in Table 3. The first model had a structure with one general factor (ICT addiction) comprising three first-order factors (MPA, SNA, and GA). The first of these comprised the total score from the TecnoTest for the addictive use of MP and compulsive use of IM indicator. The second consisted of the total addictive SN use score and the indicators of time (during the week and weekends) and weekly frequency. And the third comprised the same indicators relating to gaming (total score, time, and frequency). After rejecting this model for lack of fit, a second model was tested eliminating the items that were less representative of addictive use (frequency and time of use at weekends), which also did not adequately fit despite being more parsimonious. Lastly, all of the indicators were maintained and all of the first-order factors were eliminated (MPA, SNA, and GA); thus, a single factor model with satisfactory fit was established.

TABLE 3. Indexes of fit of the development of the factorial model of addictive behaviour towards ICT.

Models	χ^2	***df***	$\chi^2/_{df}$	***p***	***CFI***	*RMSEA*	*AIC*	*BIC*
1	199.101	29	6.866	.001	.933	.095	251.101	367.302
2	40.165	6	6.694	.001	.945	.094	70.165	137.204
3	20.725	6	3.454	.002	.976	.062	50.725	132.763

Note: χ^2: likelihood ratio index; *df*: degrees of freedom; *CFI*: comparative fit index; *RMSEA*: root mean square error of approximation; *AIC*: Akaike information criterion; *BIC*: Bayesian information criterion.

FIGURE 1. Factorial model for measuring addictive behaviour towards ICT.



The results of the model were consistent with the descriptive statistics of the sample. All of the indicators obtained adequate factorial saturations (λ_e <.4) and a considerable predictive value (R^2 <.2). Addictive use of MP was the addictive behaviour with the highest factorial weight (λ_e = .52) and predicted the greatest percentage of the variance (R^2 = .27), while addictive use of SN and gaming explained between 18% and 19% of the variance each. Nonetheless, time spent using SN was the most influential (λ_e = .7) and explanatory indicator (R^2 = .48) of addictive behaviour towards ICT.

The results of the unidimensional model indicate that, more than speaking of ICT addiction separately, the model represents a common construct of addictive use by participants of ICT, something that is coherent given the relationships between covariances across the indicators.

3.2. Study of the sample after the programme

3.2.1. Analysis of the effects of the *Clickeando* programme

The participants changed some behaviours relating to ICT following the programme (Table 4). In relation to mobile telephones, compulsive and addictive use of IM fell significantly. In the case of SN, after the programme, the participants reduced the number of weekly connections to SN, but not their time or addictive behaviour. No change in habits or addictive use of gaming was seen either.

However, the results did differ by gender. Addictive use of MP fell significantly in both groups, especially among boys. In fact, the boys displayed less compulsive use of IM after the programme. However, they did not display any change in use of SN, while the girls reduced their time and frequency. Furthermore, the boys did not change their behaviours in relation to gaming, while the girls did display significant changes after the workshop (increased frequency and reduced addictive use).

TABLE 4. Changes in indicators of use and abuse by participants after the programme in general and by gender.

Variables	Groups	*M (SD)*		*t (df)*	*p*	*CI*	*d*
		Pre	Post				
SN frequency	G	4.02 (1.34)	3.84 (1.38)	3.238 (318)	***	.07-.287	.181
	A	4.07 (1.26)	3.89 (1.32)	2.76 (191)	**	.053-.322	.199
	O	3.89 (1.44)	3.79 (1.47)	1.25 (176)	.106	-.059-.262	.094
Gaming frequency	G	2.62 (1.41)	2.71 (1.33)	-11.77 (314)	.069	-.213-.03	-.084
	A	2.01 (1.26)	2.21 (1.27)	-2.691 (188)	**	-.348-(-.054)	-.196
	O	3.27 (1.26)	3.27 (1.18)	0 (176)	.5	-.165-.165	0
SN time DW	G	2.77 (1.07)	2.73 (1.07)	.844 (316)	.2	-.055-.137	.047
	A	2.81 (1.05)	2.7 (1.06)	1.891 (190)	*	-.005-.225	.137
	O	2.7 (1.14)	2.75 (1.15)	-.798 (174)	.213	-.179-.076	-.06
SN time WE	G	3.58 (1.23)	3.52 (1.22)	1.287 (307)	.1	-.036-.172	.073
	A	3.54 (1.19)	3.42 (1.16)	1.824 (184)	*	-.01-.259	.134
	O	3.61 (1.29)	3.6 (1.32)	-.082 (167)	.467	-.15-.138	-.006
Gaming time DW	G	1.9 (1.08)	2.03 (1.13)	-2.341 (313)	**	-.234-(-.02)	-.132
	A	1.56 (.87)	1.65 (.920)	-1.441 (188)	.076	-.201-.031	-.105
	O	2.29 (1.18)	2.37 (1.23)	-.99 (174)	.162	-.24-.08	-.075
Gaming time WE	G	3.1 (1.41)	3.06 (1.41)	.918 (305)	.180	-.056-.154	.052
	A	2.37 (1.34)	2.28 (1.26)	1.326 (182)	.093	-.045-.231	.098
	O	3.88 (1.01)	3.86 (1.05)	.340 (171)	.367	-.112-.158	.026
Compulsive WhatsApp use	G	10.56 (2.734)	10.11 (2.68)	3.904 (290)	***	.223-.677	.229
	A	10.62 (2.5)	10.37 (2.66)	1.643 (177)	.051	.051-.556	.123
	O	10.45 (2.98)	9.9 (2.89)	3.162 (160)	***	.198-.858	.249
Addictive mobile phone use	G	.88 (.695)	.7 (.686)	4.866 (313)	***	.104-.246	.275
	A	.9 (.682)	.76 (.734)	3.107 (187)	***	.052-.235	.227
	O	.85 (.696)	.64 (.643)	3.949 (175)	***	.102-.307	.298
Addictive SN use	G	.24 (.535)	.20 (.505)	1.513 (315)	.066	-.013-.102	.085
	A	2.9 (.599)	.25 (.553)	1.051 (185)	.147	-.038-.124	.077
	O	.21 (.507)	.16 (.45)	1.288 (179)	.1	-.027-.127	.096
Addictive gaming use	G	.3 (.558)	.25 (.526)	1.377 (313)	.085	-.02 -.116	.078
	A	.25 (.562)	.19 (.489)	1.771 (186)	*	-.007-.124	.13
	O	.34 (.612)	.33 (.599)	.208 (175)	.418	-.096-.119	.016

Note: G: general; A: girls, O: boys; SN: social networks; DW: during the week; WE: weekend. *M*: mean; *df*: degrees of freedom; *CI*: confidence interval; *d*: effect size. *Sig.* (single tail): $p < .05$ (*), $p < .01$ (**), $p < .001$ (***).

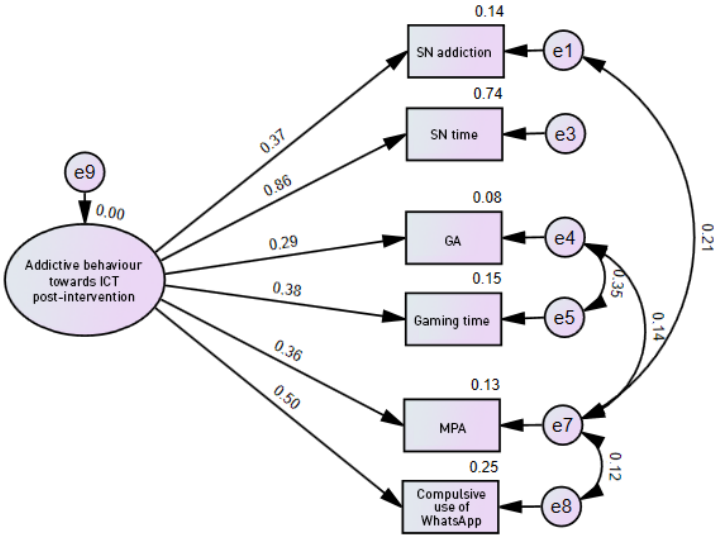
3.2.2. Factorial model of the intervention on addictive behaviour towards ICT

The factorial model of the addictive behaviour prior to the programme also adequately fitted the measurements taken after the programme (Figure 2) (χ^2 = 13.712, df=5, $\chi^2/_{df}$ = 2.742, p = .018, CFI = .984, $RMSEA$ = .052, AIC = 45.712, BIC = 117.22).

When comparing the pre- and post-models, changes in ICT use indicators are observed after the programme. Firstly, in all of the indicators of addictive ICT use, the factorial saturation reduces (mobile phone: $\Delta\lambda_e$ = .16; SN: $\Delta\lambda_e$ = .05; gaming: $\Delta\lambda_e$ = .15) as does explained variance (mobile: ΔR^2 = .14; SN: ΔR^2 = .04; gaming: ΔR^2 = .11). Secondly, the influence of gaming time also reduced ($\Delta\lambda_e$ = .09; ΔR^2 = .09), but that of SN increased its predictive value by 74% ($\Delta\lambda_e$ = .16; ΔR^2 = .26). Finally, compulsive IM use maintains its values compared with the pre model (λ_e = .5; R^2 = .25).

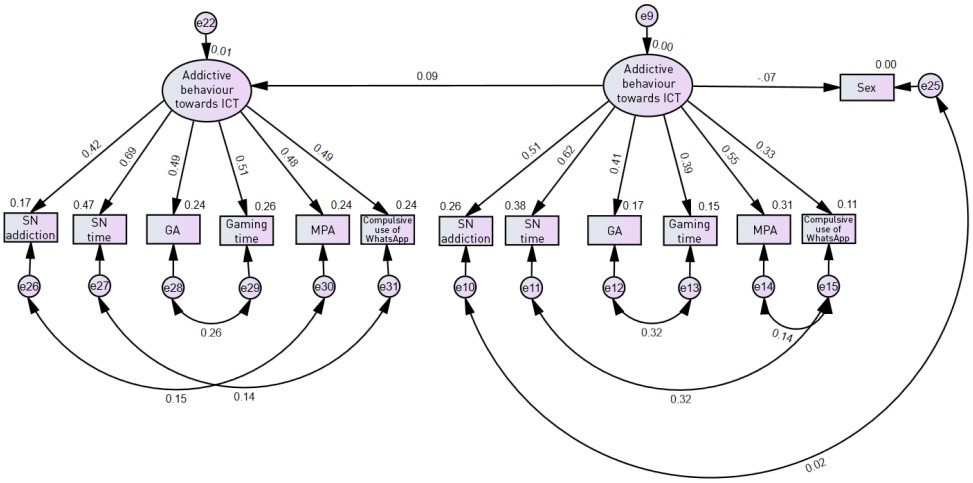
The significant reduction after the programme in scores for addictive use of MP appears to mean that this indicator loses influence for explaining addictive behaviour towards ICT. In fact, as there were no changes in SN time after the programme, this variable seems to be of relevance.

FIGURE 2. Factorial model of addictive behaviour towards ICT after the programme.



Given the gender differences observed in the t-tests, we included this variable and addictive behaviour prior to the workshop in the model (Figure 3). The path analysis of changes in addictive behaviour of the programme, despite its adequate fit (χ^2 = 162.523, df = 57, $\chi^2/_{df}$ = 2.851, p = .001, CFI = .915, $RMSEA$ = .054, AIC = 230.523, BIC = 382.478), indicated that gender (λ_e = -.07, R^2 = 0) and addictive behaviour prior to the programme (λ_e = .09, R^2 = .01) did not influence subsequent addictive behaviour.

FIGURE 3. Factorial model of addictive behaviour towards ICT after the programme by gender and prior addictive behaviour.



When including these variables in the model, we observed that the factorial loadings of the different indicators were balanced. However, these variables were eliminated from the model as they did not fulfil the minimum requirements to be integrated into the model ($\lambda_e > .4$; $R^2 > .2$). Consequently, this factorial model was rejected for interpreting addictive behaviour towards ICT after the programme.

4. Discussion

The *Clickeando* programme focuses on adolescents who have not yet developed an ICT addiction. However, as these users are the ones who use these technologies the most (especially since Covid-19) and are the most vulnerable to their addictive effects, prevention programmes should include methodologies that make it possible to detect the presence of signs of addiction, the behaviours that promote it, and also to establish what effects the programme has on addictive use of ICT and whether these differ by gender.

Of the 8 billion people in the world today, 7.33 billion have a smartphone (Taylor, 2023), 4.8 use SN (Petrosyan, 2023), and more than 2.5 billion play video games (Clement, 2023). Only a few ICT users will develop an addiction to these systems (Kuss & Griffiths, 2017; Naskar et al., 2016). Nonetheless, when we do not seek to diagnose addiction but rather to detect symptoms of it, the figures increase considerably (Sussman et al., 2011). In fact, the results show us that 18.5% of participants display symptoms of SNA, 24.3%, of GA, and 71.1%, of MPA. These incidences make it possible to understand the impact on and needs for action of a given population (King et al., 2018). *Clickeando* assumes that different online activities are done using mobile phones, which appears to be realistic with regards to the needs of the target population.

Accordingly, path analysis enabled us to define how workshop participants express addictive behaviour towards ICT, the relationship between the variables that comprise it, and how doing the programme modified them. This process made it possible to assess changes in addictive use of ICT, rectifying the impacts of the lack of an agreed definition of the concept in literature on prevention (King et al., 2018). In contrast with the classic literature (Griffiths, 1995), addictive behaviour towards ICT was defined in one dimension. This representation of the construct resembled the conceptualisation from the model of Davis (2001), who holds that problematic internet use includes general use (mobile phones) and specific use (SN and video games). This way of understanding addictive ICT use is coherent with the *Clickeando* intervention.

So much so that the model indicated that the symptoms of MPA, SNA, and GA, best explained addictive behaviour. Nonetheless, the time indicators (SN, gaming, and IM response speed) were more influential than the symptoms in the expression of addictive behaviour, given that the model was obtained on the basis of a universal preventive intervention; that is to say, from a population in which occurrence of the problem would not be expected. When comparing the two factorial models (pre and post), we observe that the influence of all of the indicators of addictive use (especially MP) reduces notably, except for SN time and compulsive use of IM. The reduction in the variance explained by the indicators (symptoms of MPA, SNA, and GA and gaming time) shows the variables on which the programme has had an effect. Similarly, the SN time indicator gained explanatory weight in the post model, and so *Clickeando* does not appear to be effective in reducing this behaviour, something shown by the within subject *t*-tests. In relation to these analyses, a reduction in compulsive use of IM was observed that was not reflected in the factorial model, something that could be explained by the change of messaging system used by the participants (the chat functions of the SN instead of WhatsApp).

These results lead us to think that, despite the criticism of prevention based on reducing time of use (Throuvala et al., 2019), SN time seems to be a fundamental variable in the development of addictive behaviour towards ICT. The participants reported a mean daily connection of up to two hours just in SN, which is close to the maximum daily digital leisure time suggested by Spain's Ministry of Health (Cartanyà-Hueso et al., 2021). Time spent on different forms of ICT during the week is time not spent on other healthier or more necessary activities. When these habits affect the social and educational spheres or the individual's health, they are referred to as *interference*, which is a symptom of addiction. Consequently, these results reflect the importance of incorporating activities or techniques in the programme that effectively reduce SN use time be strengthening protective factors (Ma et al., 2011).

In turn, the fact that the indices of prevalence of ICT addiction differ between boys and girls (SN and gaming, respectively) underlines the need to develop preventive strategies that take gender into account (Yudes

et al., 2019; Zhao et al., 2020). Although gender is an important risk factor in these technological addictions (Andreassen et al., 2016), it was not observed to influence the effects of the programme. In this sense, the programme seems to be effective at reducing the pattern and addictive use of MP in both genders (although not so much in addictive use of SN and gaming). Besides, as prior addictive use was not found to influence the results of the workshop, the effects of the addictive behaviour seem to improve in mild cases (something that would be coherent with the universal perspective of the programme). In future, it would be recommendable to include work on gaming in the specific content of the workshop, as well as assessing other indicators of SN use that might warn of unobserved changes.

Despite the evidence-based results and suggestions, such as the proposals to improve the efficacy of *Clickeando* (e.g., techniques and activities aimed at controlling SN during the week) or even of other workshops with the same aim (e.g., the usefulness of factor analysis for assessing interventions), we should note some characteristics of the study that limit the generalisation of its results, many of which are shared by other studies on this type of prevention programmes (Throuvala et al., 2019). In relation to the experimental procedure, the non-random sampling procedure, the lack of a control group, analysis of specific aspects of the workshop or characteristics of the participants (mediating and moderating variables of the programme), as well as of the analysis itself (lack of variables measuring positive use of ICT or the use of categorical or ordinal variables) are all of note.

On the contrary, the main strengths of this study include its sample size and the validity of its factorial model, which makes it possible to generalise the representation of addictive behaviour towards ICT, as well as the effects of the programme, in the population of participants in *Clickeando* from year 1 of compulsory secondary education. On the basis of the study performed, we suggest future studies that expand the assessment period to ensure the maintenance of the changes, multi-group analyses and multiple regressions to analyse the influence of gender, study of the effect of the programme on other age populations (primary school) or other preventive agents (teachers and family), as well as joint assessment of these agents to identify the effects of the programme at a multisystemic level.

In conclusion, the results of this research indicate that the *Clickeando* workshop is effective at reducing addictive use of ICT through information and changes to attitudes and behaviour relating to mobile phones in adolescents who are starting compulsory secondary education. Based on the needs of the educational community, research is striving to develop preventive methodologies following the impact of Covid-19 on excess use of ICT by adolescents. Thus, with this work, we provide evidence about the validity of *Clickeando* to help to continue to improve young people's mental health through training in the healthy use of ICT.

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Notes

The different versions of the *Clickeando* programme (students and families) and the respective teacher guides can be accessed on the website of the Plan Municipal de Drogodependencias of the City Council of Valencia. These documents are found in the "talleres preventivos" section of "prevención escolar": https://www.valencia.es/es/-/prevencion-escolar

References

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders, DSM-5.* American Psychiatric Publishing.

American Psychological Association. (2014). Guidelines for prevention in psychology. *American Psychologist, 69* (3), 285-296. https://doi.org/10.1037/a0034569

Anderson, M., & Jiang, J. (2018, 31 de mayo). Teens, social media and technology 2018. *Pew Research Center*. https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/

Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors*, *30* (2), 252-262. https://doi.org/10.1037/adb0000160

Bashir, H., & Bhat, S. A. (2017). Effects of social media on mental health: A review. *International Journal of Indian Psychology*, *4* (3), 125-131. https://doi.org/10.25215/0403.134

Berrios, B., Pérez, B., Sánchez, F., & Pantoja, A. (2020). Análisis del programa educativo "Cubilete" para la prevención de adicciones a TIC en adolescentes. Caso específico de juegos de azar y apuestas online [analysis of the "Cubilete" educational program for the prevention of ICT addictions in adolescents. Specific case of gambling and online betting]. *Revista Española de Orientación y Psicopedagogía (REOP)*, *31* (1), 26-42. https://doi.org/10.5944/reop.vol.31.num.1.2020.27289

Bhargava, R., & Seshadri, S. (2021). Screen use and behavioral addiction: Making the «porridge» healthy. *Indian Journal of Social Psychiatry*, *37* (3), 245-247. https://doi.org/10.4103/ijsp.ijsp_272_21

Cartanyà-Hueso, À., Lidón-Moyano, C., & Martínez-Sánchez, J. M. (2021). Tiempo y uso de pantallas en niños y adolescentes: revisión y comparación de las guías de cinco instituciones sanitarias [Time and use of screens in children and adolescents: a review and comparison of the guidelines of five health care institutions]. *Boletín de Pediatría*, *61* (257), 174-179. https://sccalp.org/uploads/bulletin_artcle/pdf_version/1639/BolPediatr2021_61_174-179.pdf

Chóliz, M. (2010). *Mobile phone addiction in adolescence: Evaluation and prevention of mobile addiction in teenagers*. Lambert Academic Publishing.

Chóliz, M. (2017). Prevención de las adicciones tecnológicas en la adolescencia [Preventing technological addictions in adolescence]. *Padres Y Maestros / Journal of Parents and Teachers,* (369), 53-59. https://doi.org/10.14422/pym.i369.y2017.008

Clement, J. (2023, 14 November). *Number of video gamers worldwide 2017-2027*. Statista. https://www.statista.com/statistics/748044/number-video-gamers-world/

Echeburúa, E., & De Corral, P. (2010). Adicción a las nuevas tecnologías y a las redes sociales en jóvenes: un nuevo reto [Addiction to new technologies and to online social networking in young people: A new challenge]. *Adicciones*, *22* (2), 91-95. https://doi.org/10.20882/adicciones.196

Espinel, S. P., & Leguizamón, M. C. (2022). Adicción a Internet en tiempos de COVID-19. Programa de prevención [Internet addiction in COVID-19 times. Prevention program]. *Revista Virtual Universidad Católica del Norte*, (67), 191-216. https://www.doi.org/10.35575/rvucn.n67a8

Gainsbury, S., & Blaszczynski, A. (2011). A systematic review of Internet-based therapy for the treatment of addictions. *Clinical Psychology Review*, *31* (3), 490-498. https://doi.org/10.1016/j.cpr.2010.11.007

García-Couceiro, N., Gómez, P., Kim-Harris, S., Burkhart, G., Flórez-Menéndez, G., & Rial, A. (2021, 19 May). El modelo SBIRT como estrategia de prevención de las adicciones con y sin sustancia en adolescentes [SBIRT model as a prevention strategy against addiction with and without substance in teenagers]. *Revista Española de Salud Pública*, (95), e202105065. https://www.sanidad.gob.es/biblioPublic/publicaciones/recursos_propios/resp/revista_cdrom/VOL95/C_ESPECIALES/RS95C_202105065.pdf

Gentry, J. H., & Campbell, M. (2002). *Developing adolescents: A reference for professionals*. American Psychological Association. https://www.apa.org/pi/families/resources/develop.pdf

Griffiths, M. (1995). Technological addictions. *Clinical Psychology Forum*, (76), 14-19. https://doi.org/10.53841/bpscpf.1995.1.76.14

Kaess, M., Parzer, P., Brunner, R., Koenig, J., Durkee, T., Carli, V., Wasserman, D., Hoven, C. W., Sarchiapone, M., Bobes, J., Cosman, D., Värnik, A.Resch, F., & Wasserman, D. (2016). Pathological internet use is on the rise among European adolescents. *Journal of Adolescent Health*, *59* (2), 236-239. https://doi.org/10.1016/j.jadohealth.2016.04.009

Killian, M. O., Cimino, A. N., Weller, B. E., & Hyun Seo, C. (2019). A systematic review of latent variable mixture modeling research in social work journals. *Journal of Evidence-Based Social Work*, *16* (2), 192-210. https://doi.org/10.1080/23761407.2019.1577783

King, D. L., Delfabbro, P. H., Doh, Y. Y., Wu, A. M., Kuss, D. J., Pallesen, S., Mentzoni, R., Carragher, N., & Sakuma, H. (2018). Policy and prevention approaches for disordered and hazardous gaming and Internet use: An international perspective. *Prevention Science*, *19* (2), 233-249. http://doi.org/10.1007/s11121-017-0813-1

Kline, R. B. (2010). Promise and pitfalls of structural equation modeling in gifted research [Promesas y obstáculos en el modelo de ecuaciones estructurales en superdotados]. In B. Thompson, & R. F. Subotnik (Eds.), *Methodologies for conducting research on giftedness* (pp. 147-169). American Psychological Association. https://doi.org/10.1037/12079-007

Kuss, D. J., Van Rooij, A. J., Shorter, G. W., Griffiths, M. D., & Van de Mheen, D. (2013). Internet addiction in adolescents: Prevalence and risk factors. *Computers in Human Behavior*, *29* (5), 1987-1996. http://dx.doi.org/10.1016/j.chb.2013.04.002

Kuss, D. J., Shorter, G. W., Van Rooij, A. J., Van de Mheen, D., & Griffiths, M. D. (2014). The Internet addiction components model and personality: Establishing construct validity via a nomological network. *Computers in Human Behavior*, *39*, 312-321. http://dx.doi.org/10.1016/j.chb.2014.07.031

Kuss, D. J., & Griffiths, M. D. (2017). Social networking sites and addiction: Ten lessons learned. *International journal of environmental research and public health*, *14* (3), 311. https://doi.org/10.3390/ijerph14030311

Luján-Barrera, A., & Denís, M. (2022). Adicción al móvil e impulsividad: ¿cuánto tardas en responder un mensaje de WhatsApp? [Mobile addiction and impulsivity: How long does it take to answer a WhatsApp message?]. *Informació psicològica*, (123), 24-38. https://doi.org/10.14635/IPSIC.1924

Ma, H. K., Chu, M. K., & Chan, W. W. (2011). Construction of a teaching package on promoting prosocial internet use and preventing antisocial internet use. *The Scientific World Journal*, *11*, 2136-2146. https://doi.org/10.1100/2011/672898

Marcos, M., & Chóliz, M. (2021). TecnoTest: desarrollo de una herramienta de screening de adicciones tecnológicas y juego [Tecnotest: A screening tool for technological addictions and gambling disorder]. *Adicciones*, *35* (3), 235-248. https://doi.org/10.20882/adicciones.1380

Masaeli, N., & Farhadi, H. (2021). Prevalence of internet-based addictive behaviors during COVID-19 pandemic: A systematic review. *Journal of Addictive Diseases*, *39* (4), 468-488. https://doi.org/10.1080/10550887.2021.1895962

Mora, F., Dolengevich, H., & Quintero, J. (2015). Protocolo de tratamiento de las adicciones sin sustancia psicoactiva [Treatment protocol for addictions without psychoactive substances]. *Medicine - Programa de Formación Médica Continuada Acreditado*, *11* (86), 5157-5160. https://doi.org/10.1016/j.med.2015.09.006

Naskar, S., Victor, R., Nath, K., & Sengupta, C. (2016). "One level more:" A narrative review on internet gaming disorder. *Industrial Psychiatry Journal*, *25* (2), 145-154. https://doi.org/10.4103/ipj.ipj_67_16

Observatorio Español de las Drogas y las Adicciones. (2022). *Informe sobre trastornos comportamentales 2022: juego con dinero, uso de videojuegos y uso compulsivo de internet en las encuestas de drogas y otras adicciones en España EDADES y ESTUDES [Behavioural disorders report 2022: Gambling, video game use and compulsive internet use in surveys on drugs and other addictions in Spain EDADES and ESTUDES]*. Ministerio de Sanidad. Delegación del Gobierno para el Plan Nacional sobre Drogas. https://pnsd.sanidad.gob.es/profesionales/sistemasInformacion/sistemaInformacion/pdf/2022_Informe_Trastornos_Comportamentales.pdf

Petrosyan, A. (2023, 25 de octubre). *Worldwide digital population 2023*. Statista. https://www.statista.com/statistics/617136/digital-population-worldwide/

Prats, M. Ángel, Torres-Rodríguez, A., Oberst, U., & Carbonell, X. (2018). Diseño y aplicación de talleres educativos para el uso saludable de internet y redes sociales en la adolescencia: descripción de un estudio piloto [Design and application of educational workshops for the healthy use of the internet and online social networks in adolescents: Description of a pilot study]. *Pixel-Bit. Revista de Medios y Educación*, (52), 111-124. https://doi.org/10.12795/pixelbit.2018.i52.08

Romano, J. L., & Hage, S. M. (2000). Prevention: A call to action. *The Counseling Psychologist*, *28* (6), 854-856. https://doi.org/10.1177/001100000028600

Sánchez, L., Benito, R., Serrano, A., Benavent, R. A., & Bueno, F. J. (2018). *Programa de prevención del uso problemático de internet y redes sociales. "Clickeando" [Programme for the prevention of problematic use of the internet and social networks. "Clickeando"]*. Unidad de Prevención Comunitaria en Conductas Adictivas (UPCCA-València); Plan Municipal de Drogodependencias y Otros Trastornos Adictivos (PMD); Concejalía de Sanidad, Salud y Deportes. Ayuntamiento de Valencia.

Soto, A., De Miguel, N., & Pérez-Díaz, V. (2018). Abordaje de adicciones a nuevas tecnologías: una propuesta de prevención en contexto escolar y tratamiento de rehabilitación [An approach to addiction to new technologies: a proposal for prevention in the school environment and rehabilitation treatment]. *Papeles del Psicólogo*, *39* (2), 120-126. https://doi.org/10.23923/pap.psicol2018.2867

Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). Lawrence Erlbaum Associates. https://psycnet.apa.org/record/2001-18534-000

Sussman, S., Lisha, N., & Griffiths, M. (2011). Prevalence of the addictions: a problem of the majority or the minority? *Evaluation & the Health Professions*, *34* (1), 3–56. https://doi.org/10.1177/0163278710380124

Taylor, P. (2023). *Forecast number of mobile users worldwide 2020-2015*. Statista. https://www.statista.com/statistics/218984/number-of-global-mobile-users-since-2010/

Throuvala, M. A., Griffiths, M. D., Rennoldson, M., & Kuss, D. J. (2019). School-based prevention for adolescent internet addiction: Prevention is the key. A systematic literature review. *Current Neuropharmacology*, *17* (6), 507-525. https://doi.org/10.2174/1570159X16666180813153806

Van de Schoot, R., Lugtig, P., & Hox, J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology*, *9* (4), 486-492. https://doi.org/10.1080/17405629.2012.686740

Van den Eijnden, R. J., Lemmens, J. S., & Valkenburg, P. M. (2016). The social media disorder scale. *Computers in human behavior*, *61*, 478-487. https://doi.org/10.1016/j.chb.2016.03.038

Yudes, C., Rey Peña, L., & Extremera Pacheco, N. (2019). Ciberagresión, adicción a internet e inteligencia emocional en adolescentes: un análisis de diferencias de género [Cyberbullying, internet addiction and emotional intelligence in adolescents: A gender difference analysis]. *Voces de la Educación*, (2) 27-44. https://www.revista.vocesdelaeducacion.com.mx/index.php/voces/article/view/210

Zhao, H., Li, X., Zhou, J., Nie, Q., & Zhou, J. (2020). The relationship between bullying victimization and online game addiction among Chinese early adolescents: The potential role of meaning in life and gender differences. *Children and Youth Services Review, 116*, 105261. https://doi.org/10.1016/j.childyouth.2020.105261

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An exploratory study of university students' regulation profiles and satisfaction with flipped classrooms

Estudio exploratorio sobre los perfiles de regulación y la satisfacción con el aula invertida en estudiantes universitarios

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Abstract:

This study, based on the learning patterns model, analyses the relationship between different regulation profiles and satisfaction with a flipped-classroom didactic experience at university. A profile of genuine self-regulation is identified, as well as learning profiles based on external regulation and passive regulation. A total of 178 university students participate, voluntarily answering the regulation strategies subscales of the ILS inventory and another final questionnaire about satisfaction with the flipped classroom and their perceived learning during this didactic experience. The results show a clear relationship between the self-regulation profile and satisfaction with the flipped classroom, although satisfaction was also found in students with an external regulation profile. However, this last group did not show satisfaction with their academic outcome. Another profile that was less adaptive thanks to its passiveness towards regulation was also identified. The results are discussed and the importance of designing personalised learning itineraries based on the specific command of regulation strategies is emphasised. Consequently, the design of educational actions should consider the regulation profile to adapt to students' specific characteristics and guarantee the success of the didactic strategy.

Keywords: regulation strategies, flipped classroom, university students, satisfaction, self-regulation.

Resumen:

En este estudio, sobre la base del modelo de patrones de aprendizaje, se analiza la relación existente entre diferentes perfiles de regulación y la satisfacción con una experiencia didáctica de aula invertida en la universidad. Se identifica un perfil de auténtica autorregulación, pero también perfiles de aprendizaje basados en la regulación externa e incluso en una regulación pasiva. Participan 178 universitarios que, de manera voluntaria, responden, por un lado, a las subescalas de estrategias de regulación del inventario ILS; por otro, a un cuestionario final acerca de la satisfacción con el aula invertida y la percepción de aprendizaje durante esta experiencia didáctica. Los resultados muestran una clara relación entre el perfil de autorregulación y la satisfacción con el aula invertida, aunque también se halló satisfacción en los estudiantes con un perfil de regulación externa. Sin embargo, estos últimos no se mostraron satisfechos con su resultado académico. Además, se identificó un perfil menos adaptativo por su condición de pasividad ante la regulación. Se discuten los resultados y se destaca la importancia del diseño de itinerarios personalizados de aprendizaje sobre la base del dominio específico de las estrategias de regulación. Así, el diseño de acciones formativas debe considerar el perfil de regulación para adaptarse a las características específicas de los estudiantes y garantizar el éxito de la estrategia didáctica.

Palabras clave: estrategias de regulación, aula invertida, universitarios, satisfacción, autorregulación.

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1. Introduction

Learning at university level requires activation of scientific, critical, reflexive, and self-regulated thought. This self-regulated learning would undoubtedly be identified as an important matter that should be fostered at the start of, during and after university education (Kyndt et al., 2017). However, despite having been identified as an urgent need in the late-20th century (Martínez-Fernández, 1999), autonomous learning by university students continues to be one of the major challenges facing universities. The European Higher Education Area laid the foundations for balancing students' engagement inside and outside class, which has consequently resulted in reconsideration and establishment of measures for regulating autonomous learning (Broc, 2011).

This study explores the relationship between regulation profiles and satisfaction with the innovative flipped classroom (FC) didactic strategy during processes of learning in the university. FC is a didactic strategy that has been incorporated into higher education and is recognised for fostering, among other aspects, students' active participation and autonomous learning (González-Zamar & Abad-Segura, 2022; Kapur et al., 2022; Mengual-Andrés et al., 2020; Sosa Díaz et al., 2021; Strelan et al., 2020). Consequently, it initially seems to be a very desirable option for activating critical, creative, and self-regulated thinking. However, there is a gap in the literature on differences in how students put flipped classrooms to use and their level of satisfaction with them depending on their students' regulation profiles. Accordingly, this study explores the relationship between different regulatory profiles of a group of university students, satisfaction with FC, and perceived learning.

FC is characterised by autonomous study of learning resources supported by digital technology and application and discussion in the classroom of what has been learnt (Sandobal et al., 2021). FC has been recognised as improving learning outcomes, flexible learning, time management, self-regulation, satisfaction, and motivation (Chang, et al., 2020; Galindo-Domínguez, 2021; Memon et al., 2021; Mengual-Andrés et al., 2020; Noguera et al., 2022; Noguera et al., 2023; Torres-Martín et al., 2022). Regarding satisfaction, many studies show that students report greater satisfaction with FC than with more traditional teaching methodologies (Fidan, 2023; Llic, 2021; Sointu et al., 2022; Strelan et al., 2020). However, FC is not without its challenges, as difficulties have been found relating to engagement before the class session, work overload, digital competence, and resistance to change by the students (Chen et al., 2023; Han et al., 2023b, Sosa Díaz et al., 2021). Therefore, regulation of learning appears to be a key part of FC so that, for example, time spent on independent work, particularly relating to pre-class activities, is effective. In this sense, students must be responsible for their own learning process and carry out the pre-class tasks required (Mahmood & Mohammadzadeh, 2022; Yang, 2021). It is expected that this will release instructional time in class sessions to resolve doubts, develop competences, and co-build knowledge in order to stimulate meaningful learning (Jung et al., 2022; Park & Kim, 2022; Sein-Echaluce et al., 2022).

Nonetheless, activating meaningful self-regulation and co-regulation strategies is identified as a significant challenge for university students. In this regard, Monereo et al. (2013) consider the friction between students' individual characteristics (self-regulation) and how this action connects to cooperation with others. So, while it is true that self-regulated learning integrates individual thoughts, emotions, and actions on the basis of the individual's own (personal) experiences (Zimmerman, 2000), it is a set of beliefs and actions that, in cooperative learning situations, must connect and flow or clash with the beliefs and actions of the other. Accordingly, different people with different levels/types of regulation doing a task together entails a challenge in itself; and the regulatory challenge is even greater if it also relates to the principle of FC (preparing for the class or its content).

In this sense, Vermunt (1998) defines two further categories in addition to self-regulation: external regulation and lack of regulation. Consequently, self-regulation is activated from a framework of beliefs based on the constructive conception of learning with an intrinsic motivation and positive impact on academic performance through deep processing strategies (De la Fuente et al., 2020; Martínez-Fernández & Vermunt, 2015; Vega-Martínez et al., 2023; Vermunt, 1998). A second category refers to learning beliefs that are based on memorising blocks of information and motivated by grades that activate a type of external regulation and superficial processing. Thirdly, if the basis of beliefs is dependence on stimulation by others with an ambivalent motivation, no regulation is activated (neither self- nor external-regulated) and

there would be a lack of regulation, which is a profile associated with higher levels of academic stress, a lack of coping resources, and low performance (Vega-Martínez et al., 2023).

In research into FC, some works have considered in depth the relationship with learning regulation; specifically, self-regulation of learning during independent work time has been investigated. Regarding regulation, Jung et al. (2022) underline a positive influence of guided regulation on the use of higher-level cognitive skills. Cavalcante et al. (2021) have investigated self-regulation and co-regulation in FC, concluding that further research into the different dimensions in regulation of learning is needed. In this sense, various authors are exploring the sharing of regulation processes (shared regulation and co-regulation), with positive learning outcomes (Jafarian et al., 2021; Jung et al., 2022; Kim et al., 2021; Park & Kim, 2022; Zheng et al., 2020).

With regards to self-regulation of learning, the results of the research by Park and Kim (2022) show that it has a positive impact on co-regulation, behaviour, and academic outcomes. On this line, various studies report a direct relationship between self-regulation skills and academic performance (Aslan, 2022; Hyppönen et al., 2019; Montgomery et al., 2019; Nacaroğlu & Bektaş, 2023). For their part, Doo and Bonk (2020) have shown that self-regulation has effects on learning engagement and on the success of FC. Furthermore, some studies have found that FC improves students' self-regulation skills. For example, Zarouk et al. (2020) and Bredow et al. (2021) conclude that FC increases cognitive and metacognitive functions. Latorre-Cosculluela et al. (2021) have found an improvement in self-efficacy (one of the aspects of self-regulation) in the use of FC. However, there is also evidence that university students have limited self-regulation skills (Han et al., 2023a; Klimova et al., 2022; Valenzuela et al., 2020) and so the success of implementing FC might be reduced. Likewise, some authors (López et al., 2019; Moreno-Guerrero et al., 2021) reveal serious shortcomings in teachers for the application of an FC-based learning methodology or focus. The authors essentially identify the use of new technologies, number of devices or digital skills, and teachers' beliefs as obstacles to the success of FC.

In summary, teachers' competences and students' regulation strategies require analysis in FC situations as there is little literature on the role of self-regulation (Alamry, 2017; Rasheed et al., 2020). Furthermore, the literature on other forms of regulation of learning in FC is even more limited, albeit likewise necessary (Luo et al., 2020). In this sense, the contribution of Vermunt (1998), which, from a variables-focused perspective, describes three types of regulation (self-regulation, external regulation, and lack of regulation) is of value. Furthermore, in the case of the first type, it proposes two subscales according to whether the person tends towards regulation of content, of processes, or of outcomes (see Table 1). All of this is in a line of research that has emphasised the high levels of external regulation that university students seem to require (Martínez-Fernández & Vermunt, 2015; Vega-Martínez et al., 2023; Vermunt et al., 2014), and which raises the need to distinguish between the presence of external regulation and self-regulation (De la Fuente et al., 2022).

TABLE 1. Regulation strategies.

Self-regulation	**…of processes and outcomes** Assessing progress in learning as an attempt to respond to the questions/doubts that the student poses regarding the content of a module. **…of content** As well as the official content/materials of a module, this involves searching for additional information in other sources.
External regulation	**…of processes** Limiting oneself to studying according to the instructions given in the course materials and/or by the teachers. **…of outcomes** Only evaluating learning from the results of the tasks carried out in a module.
Lack of regulation	Being aware of the difficulty of determining whether someone has command of the content of a module, or of managing the study material.

Source: Vermunt (1998).

On the basis of what is set out above, the aim of this study is to analyse the relationship between regulation profiles in university students and satisfaction in an FC didactic experience. So, we propose answering two questions:

1. What regulation profiles are identified in university students?

2. What relationship is observed between the regulation profiles, satisfaction, and the sensation of learning with an FC-based didactic experience?

2. Method

2.1. Study design

This article is part of a teaching innovation project called *Seqüències d'aprenentatge actiu i autoregulat en contextos síncrons i asíncrons (Active and self-regulated learning sequences in synchronous and asynchronous contexts)* and funded by the Universidad Autónoma de Barcelona. It consists of a teaching team of eleven people from the faculties of Educational Sciences, Sociology, and Economics, who redesigned eight modules during the 2021–2022 academic year (see Table 2). Their aim was to incorporate the flipped classroom teaching strategy to foster active and self-regulated learning.

TABLE 2. Characteristics of the modules participating in the project.

Module	Programme	Year	*N*	Duration of FC	Application sessions
1	Early Childhood Education	1	70	3 months	7
2	Primary Education	1	76	3 months	7
3	Master's in Educational Psychology	-	9	2 months	7
4	Social Education	3	48	2 months	9
5	Early Childhood and Primary Education	3	63	2 months	9
6	Economics	3	36	1 month	7
7	Social Education	3	70	1 month	8
8	Pedagogy	3	60	3 months	8

Although the modules are delivered over one semester or a whole academic year, the application of the flipped classroom ranged from one to three months. As a result of the pandemic, in modules 1 and 2, the teaching modality was intermittently face-to-face, alternating face-to-face teaching with virtual or hybrid sessions (with students connecting to the face-to-face class online) as the situation required. The other modules were face-to-face. The instruction design process was carried out over a semester. The objective in modules 1 and 2, which already used FC, was to increase consultation of resources outside class and provide evidence of knowledge acquisition. In the rest of the modules, the focus was on reducing lectures and promoting active learning in class. It was agreed that all of the designs would include at least one didactic strategy for self-regulated learning, one resource in a format other than the normal one, and one digital technology. A list of strategies for fostering self-regulation was established after a period of document review, training, and teamwork. So, an effort was made to ensure that the students consulted the resources in a guided way and demonstrated their learning. For example, the handouts offered questions for reflection that had to be answered after consulting a resource (e.g., in a forum) or guidelines for summarising content (e.g., through a mind map to be presented in class). Verification tests, one of the most used strategies, required students to answer

a series of questions with short responses during the consultation of resources (by means of short interactive H5P videos) or after it (using voting tools such as Mentimeter). Knowledge verification tests at the end of the face-to-face sessions were also used, requiring students to summarise the key ideas covered in the session. Joint construction of rubrics was used for reflecting on and becoming aware of the assessment criteria, and also as a resource to guide the learning process. In most cases, activities associated with consulting resources were assessed but not evaluated; in other words, they were given a percentage score but not a grade.

Table 3 shows the specific strategies for each stage in the flipped classroom (before, during, and after the synchronous session). The design of all of the modules included consulting resources in advance in a variety of formats (textual, audiovisual, visual, and interactive), associated with carrying out activities to verify and apply knowledge. In most cases, the synchronous time was dedicated to active learning (e.g., role plays, collaborative mindmaps, debates, problem solving, resolving dilemmas, presentations, etc.). In some modules, strategies for verification and application of knowledge were also defined after the synchronous time.

TABLE 3. Didactic strategies for regulation of learning applied during the flipped classroom.

Module	Didactic strategies for regulation of learning		
	Before the synchronous session	**During the synchronous session**	**After the synchronous session**
1 and 2 *	Handouts Recording doubts about resources Knowledge verification test	Guidelines for regulation of collaborative learning Self-evaluation test	Knowledge verification test
3	Creation of knowledge verification test by students	Knowledge verification test	
4	Handouts Recording doubts about resources		Group construction of a rubric
5		Group construction of a rubric	
6	Verification of knowledge test		Group construction of a rubric
7	Handouts		Knowledge verification test Interactive presentations
8	Handouts Knowledge verification test		

* Modules 1 and 2 share the same design, although they are delivered in two-degree programmes.

In parallel with the implementation of teaching innovation in the modules mentioned, we carried out longitudinal research, collecting data in each of the groups of students involved. This article presents the quantitative results relating to the regulation profiles identified in the students using the Inventory of Learning Styles (ILS) at the start of the experience. Equally, students' satisfaction with the FC experience and the perceived learning was measured at the end of the experience using an ad hoc questionnaire. The data from the questionnaires were listed and the results obtained were discussed with the participating teachers in the framework of the teaching innovation project, with the aim of contrasting the students' perceptions with those of the teachers.

2.2. Participants

The sample comprised 202 university students (86% female, 13% male, 0.5% non-binary, and 0.5% who did not wish to report their gender) aged between 18 and 49, with a mean age of 21.8 (*SD* = 4.3). We received 178 responses to the self-report questionnaire on regulation strategies, as well as 121 responses to the satisfaction scale. We combined into a single table, identifying each student with a code. Most of the students were taking bachelor's courses in educational sciences, while 4.5% were participants in the Master's in Educational Psychology (see Table 4).

TABLE 4. Composition of sample by programmes.

Programme	Distribution of participants
Primary Education	34.8%
Pedagogy	24.2%
Social Education	21.9%
Early Childhood Education	11.8%
Master's in Educational Psychology	4.5%
Economics	2.8%

2.3. Instruments and procedure

The information collection strategy used two instruments. First, the students completed a version of the regulation subscales (Martínez-Fernández, 2012) from the ILS (Vermunt, 1998; 2020). This instrument comprises twenty-eight items answered on a five-point Likert-type scale ranging from "I do this seldom or never" to "I do this almost always". The subscales are distributed into self-regulation, with fifteen items; external regulation, with sixteen items; and lack of regulation, with seven items. This questionnaire was applied in a group setting in class, with participants answering using their portable devices or mobile phone. A member of the research team explained the purpose of the research, and informed the respondents that the information would be kept in confidence and that the results would be returned in future. The students had the opportunity to decide whether to give informed consent before answering the questionnaire.

A factorial analysis with maximum likelihood extraction and oblimin rotation displays a four-factor structure (KMO = .731; χ^2 = 1211,95; *df* = 378; *p* <.001) (see Table 5).

TABLE 5. Exploratory factor analysis for the regulation strategies subscales.

Regulation strategies (items)	Factors			
	1	2	3	4
7. In addition to the syllabus, I study other literature related to the content of the course.	.76			
21. I add something to the subject matter from other sources.	.70			
13. I do more than I am expected to do in a course.	.61			
27. If I do not understand a study text well, I try to find other literature about the subject concerned.	.56			
26. When I am studying, I also pursue learning goals that have not been set by the teacher but by myself.	.42		.30	
1. If a textbook contains questions or assignments, I work them out completely as soon as I come across them while studying.	.37			
24. I use the instructions and the course objectives given by the teacher to know exactly what to do.	.37			

9. I notice that it is difficult for me to determine whether I have mastered the subject matter sufficiently.	.72			
6. I notice that I have trouble processing a large amount of subject matter.	.71			
20. I realise that I miss someone to fall back on in case of difficulties.	.50			
12. I realise that the objectives of the course are too general for me to offer any support.	.48			
18. I notice that the study instructions that are given are not very clear to me.	.44			
3. I realise that it is not clear to me what I have to remember and what I do not have to remember.	.41			
19. I study the subject matter in the same sequence as it is dealt with in the course.				
10. To test my learning progress when I have studied a textbook, I try to formulate the main points in my own words.		.66		
17. To test my learning progress, I try to answer questions about the subject matter which I make up myself.		.64		
25. To test my own progress, I try to describe the content of a paragraph in my own words.		.64		
23. To test whether I have mastered the subject matter, I try to think up other examples and problems besides the ones given in the study materials or by the teacher.		.44		
11. When I start reading a new chapter or article, I first think about the best way to study it.		.42		
28. If I am able to complete all the assignments given in the study materials or by the teacher, I decide that I have a good command of the subject matter.		.37		
14. If I am able to give a good answer to the questions posed in the textbook or by the teacher, I decide that I have a good command of the subject matter.		.32		
8. I learn everything exactly as I find it in the textbooks.				
4. I experience the introductions, objectives, instructions, assignments and test items given by the teacher as indispensable guidelines for my studies.				.47
16. I study according to the instructions given in the study materials or provided by the teacher.				.46
2. I study all the subject matter in the same way.				.32
15. When I have difficulty grasping a particular piece of subject matter, I try to analyse why it is difficult for me.				
5. I test my learning progress solely by completing the questions, tasks and exercises provided by the teacher or the textbook.				
22. When doing assignments, I train myself thoroughly in applying the methods dealt with in a course.				
Explained variance (40.38%)	17.12	8.97	8.53	5.76

Extraction method: maximum likelihood.
Rotation method: Oblimin with Kaiser's normalisation.

Source: adapted from Martínez-Fernández (2012) based on Vermunt (1998).
Note: to facilitate interpretation of the factors, we omitted factor weightings with absolute values below .30.

The interpretation of the results (40.38% of the explained variance), based on the content of the items and of the theoretical reference framework, enables us to infer four factors or types of regulation strategy: (1) content self-regulation, (2) lack of regulation, (3) process self-regulation, and (4) external regulation.

The students then completed an ad hoc questionnaire at the end of the FC didactic experience that measured their degree of satisfaction with the FC didactic experience. This instrument was used to find information about: (1) general details, including the module, gender, age and university access route; (2) profile, with three items about the objective for taking the module; (3) valuation of the flipped-classroom process, with seven items; and (4) perception of the learning outcomes, with eight items. All of the items in these questions are answered using a five-point Likert-type scale ranging from "disagree entirely" to "agree entirely". Finally, one section (5) measures participants' satisfaction through four questions that combine the open response option with a five-point Likert scale. The questionnaire, hosted on a platform of the university, was completed individually.

2.4. Statistical analysis

We performed a series of exploratory analyses to review the behaviour of the data and we cleansed the database. Subsequently, we analysed the resulting data using exploratory factor analysis (EFA), with maximum likelihood extraction and oblique rotation, to find the structure of the data. To identify the regulation profiles, this variables-centred perspective was combined with an analysis focused on the participants and based on cluster analysis using the k-means technique. When establishing the number of clusters, a certain balance in the number of participants in each group, the existence of significant differences between all means, as well as the consideration of theoretical criteria to interpret the final answer were pursued. After assigning the subjects to each cluster, we used one-way ANOVA to analyse possible differences in student satisfaction between different regulation profiles.

3. Results

A first approximation shows that this sample of students distinguishes between process self-regulation (factor 3) and content self-regulation (factor 1). This is a relevant finding, particularly because "content self-regulation" is the clearest factor and the one with the greatest weight when explaining variance. It would also be interesting to observe how this content self-regulation relates to external regulation or the lack of regulation. So, considering the four factors extracted in the variables-centred analysis and taking into account the mean of the items involved, the four respective variables are constructed (see Table 6).

TABLE 6. Descriptions of the regulation strategy subscales (scale 1 to 5) (N = 178).

Subscale	Alpha	Min.	Max.	Mean (*SD*)
Content self-regulation	.77	1.14	4.71	2.63 (.73)
Lack of regulation	.72	1	4.83	2.77 (.71)
Process self-regulation	.72	1.86	4.86	3.56 (.66)
External regulation	.43	1.33	5	3.34 (.75)

Higher means in absolute terms are apparent in both process self-regulation and external regulation. In addition, as is to be expected, there is a significant positive correlation between self-regulation of content and of processes (r = .36; p <.00). Also (in line with Martínez-Fernández & Vermunt, 2015), there is a significant positive correlation between strategies for self-regulation (of content and of processes) and external regulation (r = .20; p = .01), even though this may seem paradoxical. Finally, as was also to be expected, lack of regulation has a significant negative correlation with process self-regulation (r = -.16; p = .03).

We opted for a cluster analysis on the basis of the data obtained in the analysis of the variables, and with the aim of making the identification of regulation profiles more robust. So, taking into account the fact that there are three major theoretical groups of strategies (self-regulation, external regulation, and lack of regulation), the inclusion of five subscales across the three main strategies, and the fact that four factors are extracted in the factorial analysis of this study, we tested possible groupings into three, four, and five profiles. From them, and following the psychometric and theoretical criteria mentioned in the procedure, we opted for the five profile solution (see Table 7).

TABLE 7. Regulation profiles.

Regulation subscales	1	2	3	4	5
Content self-regulation (2.63)	2.55	3.05	2.07	**3.50**	2.14
Lack of regulation (2.77)	2.45	3.25	**3.64**	2.04	2.54
Process self-regulation (3.56)	3.44	**4.09**	3.17	**3.95**	3.26
External regulation (3.34)	2.53	3.65	3.01	3.75	**3.84**
N	40 (23%)	34 (19%)	32 (18%)	31 (17%)	41 (23%)

Note: 1 (passive); 2 (process self-regulation); 3 (lack of regulation); 4 (self-regulation); 5 (external regulation).

So, one group (1) was identified with values below the mean in each of the four subscales (passive). The second group (2) stands out for its mean score in process self-regulation strategies. The third group (3), in lack of regulation. Group four (4), in self-regulation of content and processes. And group (5), in external regulation strategies.

The sum of the results indicates that only 36% of the students stand out in self-regulation profiles (groups 2 and 4), while the remaining 64% is shared between dependence on external regulation (23%), lack of regulation (18%), or passive regulatory behaviour (23%).

In relation to satisfaction with the flipped-classroom didactic strategy (FC), a small difference was found between the most self-regulated groups (2 and 4) and the students identified as passive ($F = 2.60$; $df = 4$; $p = .04$). In this sense, self-regulated students report a degree of satisfaction (on the 1 to 5 scale) of 4.16 and 4.53, respectively, compared with a mean satisfaction of 3.70 that the group with the passive profile reports (group 1). Equally, another of the differences found corresponds with satisfaction with the learning achieved. The most self-regulated groups report significantly higher satisfaction (4.07 and 4.17, respectively) ($F = 3.61$; $df = 4$; $p = .01$) than that reported by the passive group (3.45).

Finally, a series of correlations between regulation variables and measures of satisfaction was found. So, content self-regulation is strongly related to satisfaction with the learning process ($r = .47$; $p < .001$), and less strongly with the learning outcomes obtained ($r = .32$; $p < .001$) and the teaching process ($r = .27$; $p < .001$). Process self-regulation also shows significant relationships with the same measures of satisfaction, but with lower intensity with the learning process ($r = .37$; $p < .00$), teaching process ($r = .22$; $p < .05$), and the learning outcomes obtained ($r = .22$; $p < .05$). Process self-regulation is related to satisfaction with communication during the FC process ($r = .22$; $p < .05$). Nonetheless, external regulation is also significantly positively related to satisfaction with the learning process ($r = .36$; $p < .00$) and to the teaching process ($r = .31$; $p < .00$), but it is not related to satisfaction with the learning outcomes obtained. Lack of regulation is not related to any of the satisfaction variables.

4. Discussion and conclusions

This study addressed two questions. Firstly, it considered the regulation profiles of a sample of university students, finding that a low proportion of students have self-regulation profiles (in line with earlier studies, such as Han et al., 2023a; Klimova et al., 2022; Valenzuela et al., 2020). These levels of low self-regulatory capacity in university students seem to prevent satisfaction with active didactic models such as FC. And this information should undoubtedly inspire deep reflection by secondary-education teachers and teachers in the early stages of university study. So, in the academic levels prior to higher education, self-regulated learning should be fostered and its value, promoted, with the aim of reducing the friction in the transition to university studies that require high levels of autonomy (Kyndt et al., 2017). In this sense, the proportion of students who require external regulation or who experience a lack of regulation (at least, with certain level of awareness) is alarming in the case of university students who have little or no preparation to assume an active and independent role in their studies (in line with Martínez-Fernández, 2015, and Vega-Martínez et al., 2023). If we add to them the students who have a passive regulatory profile, the task of "becoming aware and acting accordingly" appears to be a major challenge for today's university agenda.

In regard to the second question, which addresses the relationship between regulation profiles, satisfaction, and the sensation of learning with an FC-based didactic experience, it is no surprise that the students with self-regulation profiles report the greatest satisfaction with the experience. This raises the need to distinguish between regulation profiles when saying that students report satisfaction (Sointu et al., 2022; Strelan et al., 2020). In other words, it is necessary to identify which students are satisfied from the perspectives of teaching and learning and the outcomes obtained.

Students with a self-regulation profile, when encountering an FC didactic experience, clearly seem to derive satisfaction and a perception of learning from it. Such an assessment is in accordance with Bredow et al. (2021) and Zarouk et al. (2020). It is also in line with authors who emphasise the role of self-regulation in explaining the best results and experiences of learning (De la Fuente *et al*., 2020; Martínez-Fernández, 2019; Vermunt, 1998), or of the role of autonomy in FC-based learning (Mengual-Andrés et al., 2020). Nonetheless, external regulation is also related with satisfaction with processes (learning and teaching) (as noted by Jafarian et al., 2021; Jung et al., 2022; Kim et al., 2021; Park & Kim, 2022; Zheng et al., 2020), although not with the results obtained. This requires in-depth analysis to identify genuinely self-regulated learning pathways and also the options that are generated from external regulation (De la Fuente et al., 2022). Students, who require (depend on) external regulation, are likely to have expectations of learning outcomes that do not materialise. It seems clear that a lack of self-regulation would explain this result; and so, we believe it is important that didactic actions take these profiles into account with the aim of offering them the best learning pathways.

Finally, regarding the link between regulation profiles and satisfaction, the low satisfaction (with learning, teaching, and outcomes) that students with a passive profile report could be explained precisely by the fact that this didactic strategy requires high levels of active, autonomous, and self-regulated learning. Passive students must surely dislike this type of methodology as they lack the skills to take advantage of this type of experiences; hence their low satisfaction. Recent research into learning patterns has found that the passive profile is related to low performance, emotional difficulties, and even high levels of academic stress when encountering challenging didactic proposals (Ahmedi, 2022; Vega-Martínez, 2022).

The foregoing should be qualified taking into account the possible limitations of this study: (a) it is an exploration of regulation profiles using a model that has still not been explored in depth; (b) a clearer representation of students at different levels/years of the course is needed; (c) a more uniform measure of the effectiveness of a flipped-classroom didactic strategy is required, one that is understood and accepted as such; and (d) there is a clear need to differentiate learning profiles and itineraries.

Despite these limitations, the results of this investigation seem to establish a need to identify students' regulatory profiles before implementing active learning methodologies. As Cavalcante et al. (2021), Luo et al. (2020) and Vermunt (2020) claim, it is necessary to expand research into the different dimensions of regulation. Accordingly, the learning pathway will differ depending on the student's starting point (self-regulation, external regulation, passive profile, regulation of processes, of content, etc.). Therefore, designing

personalised learning itineraries is proposed as a very necessary way to optimise the success of educational initiatives. Still more relevant would be fostering the potential of people who learn in the university, so that they achieve the desired self-regulation and this enables them to be satisfied with their learning processes and outcomes.

Future lines of research should include analysis of different specific commands relating to successful FC experiences, analysis of the processes of change (expectations-results) from a longitudinal perspective, as well as the possible (necessary) transfer of active learning to other modules that are not designed with an FC focus. Equally, and in line with authors such as López Belmonte et al. (2019) and Moreno-Guerrero et al. (2021), we claim the need to analyse the digital competence of the teachers who participate in FC experiences, as well as their technical, pedagogical, and regulatory skills in the face of such a challenge. This is a mixture of variables and relations that undoubtedly poses a very interesting challenge for researchers in the field of teaching and learning processes.

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References

Ahmedi, S. (2022). *Learning patterns and social-emotional learning of Balkan students in secondary education* [Doctoral dissertation]. TDX (Tesis Doctorals en Xarxa). http://hdl.handle.net/10803/688526

Alamry, A. M. (2017). *Flipped learning and self-regulated learning experiences in higher education: A qualitative case study* [Doctoral dissertation]. Western Sydney University. http://hdl.handle.net/1959.7/uws:45934

Aslan, S. A. (2022). The effect of flipped classroom approach on learning achievement, online self-regulation and interaction in synchronous distance education. *Journal of Educational Technology and Online Learning*, *5* (3), 535-552. https://doi.org/10.31681/jetol.1094205

Bredow, C. A., Roehling, P. V., Knorp, A. J., & Sweet, A. M. (2021). To flip or not to flip? A meta-analysis of the efficacy of flipped learning in higher education. *Review of Educational Research, 91* (6), 878-918. https://doi.org/10.3102/00346543211019122

Broc, M. Á. (2011). Voluntad para estudiar, regulación del esfuerzo, gestión eficaz del tiempo y rendimiento académico en alumnos universitarios [Willingness to study, effort regulation, effective time management and academic performance in university students]. *Revista de Investigación Educativa*, *29* (1), 171-185. https://revistas.um.es/rie/article/view/110731

Cavalcante, A., James, D., Santos, D., & Ferreira, U. (2021). Regulation of flipped learning activities in programming: A systematic review. *International Journal for Innovation Education and Research*, *9* (8). https://doi.org/10.31686/ijier.vol9.iss8.3265

Chang, C., Kao, C., & Hwang, G. (2020). Facilitating students' critical thinking and decision-making performances: A flipped classroom for neonatal health care training. *Educational Technology & Society*, *23* (2), 32-46. https://www.jstor.org/stable/26921132

Chen, T., Luo, H., Wang, P., &in, X., & Yang, J. (2023). The role of pre-class and in-class behaviors in predicting learning performance and experience in flipped classrooms. *Heliyon, 9* (4), e15234. https://doi.org/10.1016/j.heliyon.2023.e15234

De la Fuente, J., Martínez-Vicente, J. M., Santos, F. H., Sander, P., Fadda, S., Karagiannopoulou, A., Boruchovitch, E., & Kauffman, D. F. (2022). Advances on self-regulation models: A new research agenda through the Sr vs Er behavior theory in different psychology contexts. *Frontiers in Psychology*, *13*, 861493. https://doi.org/10.3389/fpsyg.2022.861493

De la Fuente, J., Paolini, P. V., Vera-Martínez, M., & Garzón-Umerenkova, A. (2020). Effect of levels of self-regulation and situational stress on achievement emotions in undergraduate students: Class, study and testing. *International Journal of Environmental Research and Public Health*, *17* (12), 4293. https://doi.org/10.3390/ijerph17124293

Doo, M. Y., & Bonk, C. J. (2020). The effects of self-efficacy, self-regulation and social presence on learning engagement in a large university class using flipped learning. *Journal of Computer Assisted Learning*, *36* (6), 997-1010. https://doi.org/10.1111/jcal.12455

Fidan, M. (2023). The effects of microlearning-supported flipped classroom on pre-service teachers' learning performance, motivation and engagement. *Education and Information Technologies*, (28), 12687-12714. https://doi.org/10.1007/s10639-023-11639-2

Galindo-Dominguez, H. (2021). Flipped classroom in the educational system: Trend or effective pedagogical model compared to other methodologies? *Educational Technology & Society*, *24* (3), 44-60. https://www.jstor.org/stable/27032855

González-Zamar, M.-D., & Abad-Segura, E. (2022). Global evidence on flipped learning in higher education. *Education Sciences*, *12* (8), 515. https://doi.org/10.3390/educsci12080515

Han, J., DiGiacomo, D. y Usher, E. (2023a) College students' self-regulation in asynchronous online courses during COVID-19. *Studies in Higher Education, 48* (9), 1440-1454. https://doi.org/10.1080/03075079.2023.2201608

Han, H., Røkenes, F. M. y Krumsvik, R. J. (2023b). Student teachers' perceptions of flipped classroom in EFL teacher education. *Education and Information Technologies*. https://doi.org/10.1007/s10639-023-11839-w

Hyppönen, L., Hirsto, L., & Sointu, E. (2019). Perspectives on university students' self-regulated learning, task-avoidance, time management and achievement in a flipped classroom context. *International Journal of Learning, Teaching and Educational Research*, *18* (13), 87-106. http://doi.org/10.26803/ijlter.18.13.5

Jafarian, A., Salah, R. M., Alsadoon, A., Patel, S., Alves, G. R., & Prasad, P. W. C. (2021). Modify flipped model of co-regulation and shared-regulation impact in higher education, and role of facilitator on student's achievement. In The Institute of Electrical and Electronics Engineers (Ed.), *International Conference on Computational Science and Computational Intelligence (CSCI)* (pp. 925-932). IEEE Computer Society. http://doi.org/10.1109/CSCI54926.2021.00066

Jung, H., Park, S. W., Kim, H. S., & Park, J. (2022). The effects of the regulated learning-supported flipped classroom on student performance. *Journal of Computing in Higher Education*, (34), 132-153. https://doi.org/10.1007/s12528-021-09284-0

Kapur, M., Hattie, J., Grossman, I., & Sinha, T. (2022). Fail, flip, fix, and feed – Rethinking flipped learning: A review of meta-analyses and a subsequent meta-analysis. *Frontiers in Education, 7*, 956416. https://doi.org/10.3389/feduc.2022.956416

Kim, Y., Kim, N., & Chae, M. (2021). Effects of flipped learning on nursing students: A mixed methods study. *Japan Journal of Nursing Science*, *18* (3), e12425. https://doi.org/10.1111/jjns.12425

Klimova, B., Zamborova, K., Cierniak-Emerych, A., & Dziuba, S. (2022). University students and their ability to perform self-regulated online learning under the COVID-19 pandemic. *Frontiers in psychology*, *13*, 781715. https://doi.org/10.3389/fpsyg.2022.781715

Kyndt, E., Donche, V., Trigwell, K., & Lindblom-Ylänne, S. (2017). *Higher education transitions: Theory and research*. Routledge.

Latorre-Cosculluela, C., Suárez, C., Quiroga, S., Anzano-Oto, S., Lira-Rodríguez, E., & Salamanca-Villate, A. (2022). Facilitating self-efficacy in university students: An interactive approach with flipped classroom. *Higher Education Research & Development, 41* (5), 1603-1617. https://doi.org/10.1080/07294360.2021.1937067

Llic, U. (2021). Online course satisfaction in a holistic flipped classroom approach. *Journal of Educational Technology & Online Learning*, *4* (3), 432-447. http://doi.org/10.31681/jetol.935325

López Belmonte, J., Pozo Sánchez, S., Fuentes Cabrera, A. y López Nuñez, J. A. (2019). Creación de contenidos y flipped learning: un binomio necesario para la educación del nuevo milenio [Content creation and flipped learning: A necessary pairing for education in the new millennium]. **Revista Española de Pedagogía**, *77* (274), 535-555. https://doi.org/10.22550/REP77-3-2019-07

Luo, Z., O'Steen, B., & Brown, C. (2020). Flipped learning wheel (FLW): A framework and process design for flipped L2 writing classes. *Smart Learning Environments*, (7), 10. https://doi.org/10.1186/s40561-020-00121-y

Mahmood, A. M., & Mohammadzadeh, B. (2022). The effectiveness of ICT-supported flipped learning in an EFL context: A case of northern Iraq. *Frontiers in Psychology*, (13), 943956. https://doi.org/10.3389/fpsyg.2022.943956

Martínez-Fernández, J. R. (1999). Aprendizaje en la universidad. Del énfasis en los productos al énfasis en los procesos [Learning at university. From an emphasis on products to an emphasis on processes.]. *Revista Latinoamericana de Psicología*, *31* (3), 491-504. https://www.redalyc.org/pdf/805/80531305.pdf

Martínez-Fernández, J. R. (2012). *Escala de regulación [Regulation scale]* [Unpublished document]. Grup de Recerca PAFIU, Universitat Autònoma de Barcelona.

Martínez-Fernández, J. R., & Vermunt, J. D. (2015). A cross-cultural analysis of the patterns of learning and academic performance of Spanish and Latin-American undergraduates. *Studies in Higher Education*, *40* (2), 278-295. https://doi.org/10.1080/03075079.2013.823934

Memon, T. D., Jurin, M., Kwan, P., Jan, T., Sidnal, N., & Nafi, N. (2021). Studying learner's perception of attaining graduate attributes in capstone project units using online flipped classroom. *Education Sciences, 11* (11), 698. https://doi.org/10.3390/educsci11110698

Mengual-Andrés, S., López Belmonte, J., Fuentes Cabrera, A., & Pozo Sánchez, S. (2020). Modelo estructural de factores extrínsecos influyentes en el flipped learning [Structural model of extrinsic factors affecting flipped learning]. *Educación XX1, 23* (1), 75-101. https://doi.org/10.5944/educxx1.23840

Monereo, C., Castelló, M., & Martínez-Fernández, J. R. (2013). Prediction of success in teamwork secondary students. *Revista de Psicodidáctica*, *18* (2), 235-255. https://doi.org/10.1387/RevPsicodidact.6776

Montgomery, A. P., Mousavi, A., Carbonaro, M., Hayward, A. V., & Dunn, W. (2019). Using learning analytics to explore self-regulated learning in flipped blended learning music teacher education. *British Journal of Educational Technology*, *50* (1), 114-127. http://doi.org/10.1111/bjet.12590

Moreno-Guerrero, A. J., Soler-Costa, R., Marín-Marín, J. A., & López-Belmonte, J. (2021). Flipped learning y buenas prácticas docentes en educación secundaria [Flipped learning and good teaching practices in secondary education]. *Comunicar*, (68), 107-117. https://doi.org/10.3916/C68-2021-09

Nacaroğlu, O., & Bektaş, O. (2023). The effect of the flipped classroom model on gifted students' self-regulation skills and academic achievement. *Thinking Skills and Creativity*, *47*, 101244. https://doi.org/10.1016/j.tsc.2023.101244

Noguera, I., Albó, L., & Beardsley, M. (2022). University students' preference for flexible teaching models that foster constructivist learning practices. *Australasian Journal of Educational Technology*, *38* (4), 22-39. https://doi.org/10.14742/ajet.7968

Noguera, I., Robalino, P. E., & Ahmedi, S. (2023). The flexibility of the flipped classroom for the design of mediated and self-regulated learning scenarios. *RIED-Revista Iberoamericana de Educación a Distancia*, *26* (2), 155-173. https://doi.org/10.5944/ried.26.2.36035

Park, S., & Kim, N. H. (2022). University students' self-regulation, engagement and performance in flipped learning. *European Journal of Training and Development*, *46* (1/2), 22-40. https://doi.org/10.1108/EJTD-08-2020-0129

Rasheed, R. A., Kamsin, A., Abdullah, N. A., Kakudi, H. A., Ali, A. S., Musa, A. S., & Yahaya, A. S. (2020). Self-regulated learning in flipped classrooms: A systematic literature review. *International Journal of Information and Education Technology*, *10* (11), 848-853. http://doi.org/10.18178/ijiet.2020.10.11.1469

Sandobal Verón, V. C., Marín, M. B., & Barrios, T. H. (2021). El aula invertida como estrategia didáctica para la generación de competencias: una revisión sistemática [The flipped classroom as a didactic strategy for the generation of competencies: a systematic review]. *RIED-Revista Iberoamericana de Educación a Distancia*, *24* (2), 285-308. https://doi.org/10.5944/ried.24.2.29027

Sein-Echaluce, M.L., Fidalgo-Blanco, Á., Balbín, A.M., & García-Peñalvo, J. G. (2022). Flipped Learning 4.0. An extended flipped classroom model with education 4.0 and organisational learning processes. *Universal Access in the Information Society*. https://doi.org/10.1007/s10209-022-00945-0

Sointu, E., Hyypiä, M., Lambert, M. C., Hirsto, L., Saarelainen, M., & Valtonen, T. (2022). Preliminary evidence of key factors in successful flipping: predicting positive student experiences in flipped classrooms. *Higher Education*, (85), 503-520. https://doi.org/10.1007/s10734-022-00848-2

Sosa, M. J., Guerra, J., & Cerezo, M. (2021). Flipped classroom in the context of higher education: Learning, satisfaction and interaction. *Education Sciences*, *11* (8), 416. http://dx.doi.org/10.3390/educsci11080416

Strelan, P., Osborn, A., & Palmer, E. (2020). Student satisfaction with courses and instructors in a flipped classroom: A meta-analysis. *Journal of Computer Assisted Learning*, *36* (3), 295-314. https://doi.org/10.1111/jcal.12421

Torres-Martín, C., Acal, C., El-Homrani, M., & Mingorance-Estrada, A. C. (2022). Implementation of the flipped classroom and its longitudinal impact on improving academic performance. *Educational Technology Research and Development*, *70*, 909-929. https://doi.org/10.1007/s11423-022-10095-y

Valenzuela, R., Codina, N., Castillo, I., & Pestana, J. V. (2020). Young university students' academic self-regulation profiles and their associated procrastination: Autonomous functioning requires self-regulated operations. *Frontiers in Psychology*, *11*, 354. https://doi.org/10.3389/fpsyg.2020.00354

Vega-Martínez, A. (2022). *Evolución de los patrones de aprendizaje en universitarios iberoamericanos: relaciones con la regulación, el estrés académico y el rendimiento* [Evolution of learning patterns in Latin American university students: relationships with regulation, academic stress and performance] [Doctoral dissertation]. TDX (Tesis Doctorals en Xarxa).

Vega-Martínez, A., Martínez-Fernández, J. R., & Coiduras-Rodríguez, J. Ll. (2023). Patrones de aprendizaje, estrés académico y rendimiento en universitarios de primer curso: un estudio exploratorio [Learning patterns, academic stress and performance in first-year university students: An exploratory study]. *Revista EDUCAR*, *59* (1), 163-178. https://doi.org/10.5565/rev/educar.1527

Vermunt, J. D. (1998). The regulacion of construtive learning processes. *British Journal of Educational Psychology*, *68* (2), 149-171. https://doi.org/10.1111/j.2044-8279.1998.tb01281.x

Vermunt, J. D. (2020). Surveys and retrospective self-reports to measure strategies and strategic processing. In D. L. Dinsmore, L. K. Fryer, & M. M. Parkinson (Eds.), *Handbook of strategies and strategic processing* (pp. 259-274). Routledge. https://doi.org/10.4324/9780429423635-16

Vermunt, J. D., Bronkhorst, L. H., & Martínez-Fernández, J. R. (2014). The dimensionality of student learning patterns in different cultures. In D. Gibels, V. Donche, J. T. Richardson, & J. D. Vermunt (Eds.), *Learning patterns in higher education: Dimensions and research perspectives* (pp. 33-55). Routledge.

Yang, J. S. M. (2021). Promoting student engagement and preparation in flipped learning's pre-class activities: A systematic review. *Journal of Higher Education Theory and Practice*, *21 (*5). https://doi.org/10.33423/jhetp.v21i5.4282

Zheng, X.-L., Kim, H.-S., Lai, W.-H., & Hwang, G.-J. (2020). Cognitive regulations in ICT-supported flipped classroom interactions: An activity theory perspective. *British Journal of Educational Technology*, *51* (1), 103-130. https://doi.org/10.1111/bjet.12763

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). Academic Press. https://doi.org/10.1016/B978-012109890-2/50031-7

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Critical analysis and guidelines for improving models for assessing ethical and civic competence in service-learning

Análisis crítico y líneas para la mejora de los modelos de evaluación de la competencia ética y cívica en el aprendizaje-servicio

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Abstract:

INTRODUCTION. In recent years, development of the ethical and civic competence (ECC) that service-learning promotes has aroused the interest of educational communities around the world, in line with the pursuit of a holistic humanist education that prepares students for the challenges of living and coexisting in society. However, research into the impact of the implementation of service-learning seems to show that assessment of this competence is not well developed. Therefore, the aim of this study is to provide a critical analysis of the most significant ECC assessment methods and instruments in order to develop lines for improvement to promote assessment in educational action and scientific knowledge of this essential aspect in service-learning projects. METHOD. To achieve this objective, we developed an assessment tool, the content of which was validated through expert judgement. This tool made it possible to analyse the ECC assessment methods selected owing to their importance in the area studied based on formal and content-related identifying criteria. RESULTS. In this analysis, we found methods mainly from Spain and the USA, generally designed for summative assessment in questionnaire format. These methods essentially focus on civic assessment of ECC, centring on assessing the development of social responsibility and interpersonal skills. Study of the developing reflexivity is dominant in the assessment of the ethical dimension. DISCUSSION AND CONCLUSIONS. A number of areas for improvement are presented, which are aimed at creating a mixed multifocal assessment method that makes it possible to assess the dimensions of ECC in all of their complexity. Thus, we hope to contribute to the consolidation of service-learning to promote a holistic education that is committed to society and to people's well-being.

Keywords: service-learning, assessment, competence, ethics, civics, moral education, character education, education for citizenship, community education, social justice, common good, expert judgement.

Resumen:

INTRODUCCIÓN. El desarrollo de la competencia ética y cívica (CEC) que promueve el aprendizaje-servicio ha suscitado el interés de comunidades educativas de todo el mundo en los últimos años, en consonancia con la búsqueda de una educación integral humanista que prepare a los educandos para los retos de vivir y convivir en sociedad. No obstante, la evaluación de esta competencia parece desarrollada en un grado menor a la luz de las investigaciones relacionadas con el impacto de la aplicación del aprendizaje-servicio. Por ello, este estudio tiene como objetivo analizar, de forma crítica, los métodos e instrumentos de evaluación más relevantes. El fin es elaborar unas líneas de mejora que impulsen dicha evaluación hacia la acción educativa y el conocimiento científico sobre este aspecto central en proyectos de aprendizaje-servicio. MÉTODO. Para la consecución de este objetivo, se construyó una herramienta evaluativa cuyo contenido fue validado por expertos. Con ella, se analizaron los métodos de evaluación de la CEC seleccionados por su relevancia en el área estudiada de acuerdo con criterios identificativos, de forma y de contenido. RESULTADOS. En este análisis, encontramos métodos provenientes, en su mayoría, del contexto español y norteamericano, y concebidos en general para la evaluación sumativa en formato de cuestionario. Estos métodos se enfocan, sobre todo, en la evaluación cívica de la CEC; en concreto, en la evaluación del desarrollo de responsabilidad social y de habilidades inter-

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personales. En la evaluación de la dimensión ética, prevalece el estudio del desarrollo de la reflexividad. DISCUSIÓN Y CONCLUSIONES. Se presentan unas líneas de mejora orientadas hacia la creación de un método evaluativo mixto y multifocal que permita evaluar las dimensiones de la CEC en toda su complejidad. Con ello, se espera contribuir a la consolidación del aprendizaje-servicio para la promoción de una educación integral comprometida con la sociedad y el bienestar de las personas.

Palabras clave: aprendizaje-servicio, evaluación, competencia, ética, civismo, educación moral, educación del carácter, educación para la ciudadanía, educación comunitaria, justicia social, bien común, juicio de expertos.

1. Introduction

Since the late 20th-century, pedagogical approaches aimed at a holistic educational model that goes beyond the solely intellectual aspect have gained momentum in educational research and actions in the USA and have spread around the world. One of the proposals that make up this current is character education, which from its beginnings has taken on a multifaceted definition, with different disciplinary approaches from education, philosophy, and psychology, principally (Bernal, 2020). Character education has spread in the field of pedagogy, albeit not without various issues; for instance, the concern about its potential risk of indoctrination (Smith, 2022) or the challenge of reaching a consensus about the content of this teaching (Arthur, 2005) in a diverse and plural social context. And it has done as a form of moral education, with a neo-Aristotelian perspective in most cases, that is aimed at progress in the acquisition of virtues (not only moral, but also intellectual, and instrumental) that guide the individual towards a full and flourishing life (Kristjánsson, 2015; Harrison et al., 2016; Fuentes, 2018). This necessarily involves the development of ethical, civic, and emotional aspects (Esteban, 2015). It is at this point where moral education, in close relationship with character education, relates to citizenship education as the acquisition of ethical virtues is connected to the development of civic virtues, and these feed back into one another and need one another to flourish (Camps, 2005). Nonetheless, although moral education per se involves shaping citizens (Arthur, 2005), education for citizenship is necessary for the explicit learning of content and civic virtues. Such learning will be acquired through experiences that provide spaces for reflection and critical analysis of reality in relation to the social functioning of our micro- and macro-communities (McLaughlin, 2006).

This trend has aroused interest in the search for new forms of educational action that contribute to the acquisition of these virtues, with service-learning (SL) standing out in this context. Service-learning has grown and expanded exponentially in recent years all over the world. It stands out among the different innovative methodologies for its ability to have a positive impact in not just academic and cognitive, vocational and professional, personal and social areas, but also, and especially, in integrating this impact with the development of ethical and civic competence (ECC) among its participants (Furco, 2004). The implementation of SL contributes to the balance between pedagogical individualism and communitarianism identified by Quintana (1988) as one of the contradictions of education. In other words, to the symbiosis between individual and moral development, and social productivity as a citizen who collaborates to benefit his or her community and the common good (Etzioni, 2001; Redondo-Corcobado & Fuentes, 2022). So, development of the ethical dimension and development of citizenship are presented as interrelated in academic literature about SL, as elements that form part of the very essence of education contained in SL projects.

A number of studies refer to civic development driven by participation in SL projects, raising questions about the development of an active, democratic, and participatory citizenship through social action in the community that promotes civic commitment and social responsibility (Martínez-Odría, 2007; Tapia, 2010; Martínez, 2010; Bringle & Clayton, 2021). All of this helps the individual to comprehend and become aware of political problems, to develop social skills in the space shared with others, as well as to construct its own identity in relation to its community (Puig et al., 2011; Salam et al., 2019; Fuentes et al., 2022).

This civic dimension is driven by a development of ethics with which it feeds back and which is unavoidable in SL (Opazo et al., 2015; González-Geraldo et al., 2017). Such development of ethics adopts an inductive

process for acquiring virtues through which, starting with the experiential situation facilitated by participation in this type of project, individuals develop abstract arguments and their own cognitive processes (Zayas et al., 2019). These relate to questions such as social justice (Stith et al., 2021), judgement and deliberation for decision making (Puig et al., 2011; Chiva et al., 2018) based on the axiological system itself, or critical and self-critical reflection, understood as a form of critical thinking (Rodríguez-Izquierdo, 2018) and which is one of the intrinsic and central elements of SL (Deeley, 2016).

This reciprocal development involving the ethical and civic dimensions makes it possible to move towards a balance between them. This must be the objective of SL, which Zayas et al. (2019) define as a civic ethics. That is, as the combination of the ethical development of individuality and connection with the community, which avoids the dissolution of the individual in the collectivity and prevents development of the personality that is disconnected from problems relating to the common good.

However, while the development of ECC has been one of the principal objects of interest of SL for many academics and professionals from the field of education, and assessment of the different impacts of the application of SL has been a focus of attention for all of the educational community since it started to be practised in the USA (Moely et al., 2002), assessment of the development of ECC in SL has not undergone a similar evolution. In this sense, the trend has essentially been to assess the learning of content more than community-related learning, in line with what Pollack (2015) called the "pedagogicalization of SL". By this, he refers to its reduction to a teaching method that only or primarily perfects acquisition of theoretical knowledge by students, thus displacing any attention to its capacity to transform them as people and citizens and, ultimately, to transform the community.

This trend could result from the difficulties associated with the comprehension and assessment of the ethical and civic learnings that relate to its particular nature (García-Gutiérrez et al., 2018). For example, to the fact that development of these virtues is not dichotomous (Curren & Kotzee, 2014) and cannot be assessed as suitable or unsuitable, but rather is gradual; that is to say, that individuals cannot be assessed on the basis of whether they have acquired one of a number of virtues, but for their own progress in the process of this acquisition. Another important challenge for assessing ECC in SL is that it is an object that is hard to measure, as it involves different ideas, skills, and attitudes, and so requires a general and specific, quantitative and qualitative assessment. It is what Alexander (2016, p. 316), returning to the words of Ryle (1971), calls a thick and thin description. In other words, a complex and multifocal assessment method that combines various techniques with quantitative and qualitative focuses to embrace all of the elements to assess. To do this, some authors such as Pérez (2016) present a series of different techniques for assessing moral and non-moral virtues including questionnaires, rubrics, field diaries, discussions, observation, and interviews among others.

Furthermore, if assessment of ECC is not undertaken with sufficient breadth and depth or is done in a piecemeal way focussing on a single dimension of learning, it is possible that the assessment will be reduced and simplified to predetermined patterns of behaviour. From them, erroneous inferences can be drawn, or they can even result in some forms of indoctrination that do not consider the reflexive dimension of the individual and the necessary link with the behavioural and affective dimensions (Ibáñez-Martín, 2021). This would correspond with the non-expansive model of Alexander (2016), which refers to ethical and moral indoctrination, through the reproduction of "prefabricated" traits or behaviours and which implies virtually no personal and/or social growth by the individual, but rather the simple learning of irreflexive behaviours that are liable to turn students into "moral automata" (Puig et al., 2017, p. 125, own translation).

Furthermore, the participatory and democratic nature of SL means that this assessment has to include all actors involved in the project, both academic and social, from inside and outside the classroom, considering the individuals and other people who comprise the school, family, and social community where ethical-civic learning occurs (Bringle, 2021). If to this we add the need to perform the assessment in sufficient depth and by constructing, applying, and analysing a complex method of assessment in the short time scale these projects often have, or the in the short-, medium-, or long-term transformational intent of SL projects, assessing ECC can involve a very high level of difficulty to be confronted by already overloaded teachers (Palape et al., 2022).

This imbalance between the interest in ECC that SL promotes and its assessment is the motivation behind

this study. So, the aim of this article is to analyse critically the methods and instruments for assessing ethical-civic competence in SL, as well as developing lines to improve the promotion of this assessment in educational action and scientific knowledge of this fundamental aspect in this type of projects.

2. Method

We developed an ad hoc assessment tool that includes the criteria for carrying out the analysis based on a theoretical review of the most relevant elements and subdimensions of ECC associated with SL. This tool was subjected to a process of content validation by means of the judgement of a panel of experts. Escobar-Pérez and Cuervo-Martínez (2008) define this as "an informed opinion by people with a track record in the field, who are recognised by others as qualified experts on it, and who can give information, evidence, judgements, and valuations" (p. 29, own translation). Fifteen specialists in the field, eight male and seven female, participated in this judgement, following the selection criteria proposed by Skjong and Wentworht (2001) for this type of process: all of the participants had experience in providing judgements and evidence-based or experience-based decision-making and they had a good reputation in the field of academic research into SL, ethics, and citizenship. They also had a mean of eight years' experience of SL-related teaching, research, and/or management of institutional bodies, such as coordinating offices for this type of initiative in faculties or universities. The choice of experts also aimed to ensure the presence of higher education institutions from across Spain, with experts from nine universities involved: Universidad de Castilla La Mancha, Universidad Complutense de Madrid, Universidad de Santiago de Compostela, Universidad de Barcelona, Universidad de Valencia, CES Don Bosco, Universidad de Murcia, Universidad Autónoma de Barcelona, and Universidad Católica de Valencia.

These experts qualitatively and quantitatively assessed the items presented with regards to their pertinence, relevance, and clarity in the study of ethical-civic assessment in SL. Aiken's V content validity coefficient (Aiken, 1980; Penfield & Giacobbi, 2004) was calculated for all of their responses, and this was considered satisfactory from a minimum value of 0.8 (Merino & Livia, 2009), giving a positive result in the three dimensions analysed (0.9, 0.87, and 0.83).

The qualitative responses helped improve the delineation, classification, and structure of the elements to be analysed with this tool, which was finally structured into three categories of analysis criteria: firstly, identification criteria, relating to the provenance of the tool, such as the year of publication, the authors, and its provenance; secondly, formal criteria, relating to the type of assessment, assessor, recipients, and instrument analysed; and, finally, content criteria. In this last category, which forms the most extensive part of the study, assessment instruments were analysed on the basis of how much they explore the elements that comprise the ECC subdimensions of SL. So, after the contributions by the experts in the validation process, the presence and depth of the following elements in the methods analysed was examined: for the ethical competence, reflexive capacity, the sense of social justice, the capacity for judgement-deliberation and self-knowledge; and for the civic competence, democratic citizenship, social responsibility, the sense of belonging to the community, and interpersonal skills (Table 1). It should be noted that the categorisation of the different dimensions and subdimensions connected to ECC that is described above and represented in Table 1 is not intended to be a simplification based on a global anthropological conception of the ethical and the civic, but is the result of reflection on the link between this competence and its different elements with the specific proposals of SL.

TABLE 1. Dimensions and subdimensions of ethical and civic competence in service-learning.

Ethical and civic competence (ECC)	
Ethical dimension	**Civic dimension**
Reflexive capacity	Democratic citizenship
Sense of social justice	Social responsibility
Capacity for judgement-deliberation	Sense of belonging to the community
Self-knowledge	Interpersonal skills

The instruments analysed were selected by a process of triangulation with the participation of two experts. After carrying out an exhaustive review of the literature about existing methods for assessing SL, the experts selected and independently examined high-impact publications in English and Spanish that focused on ethical and/or civic assessment, whether they were fully dedicated to the specific assessment of these dimensions or included it as part of a general assessment. Consequently, fourteen instruments were valued by both experts as pertinent for the study and eventually selected. They had been published between 1997 and 2020 (Table 2), a period that coincides with the start of the expansion of the relevant literature on SL in Spain (Redondo-Corcobado & Fuentes, 2020). All of them stood out, either for the variety of elements assessed relating to the ethical-civic dimension and/or for the depth with which some of these elements were tackled.

TABLE 2. Publications that include the instruments selected for analysis in the study.

Year of publication	Author(s) of the publication	Title of the publication
1997	Eyler et al.	The impact of service-learning on college students
2002	Moely et al.	Psychometric properties and correlates of the Civic Attitudes and Skills Questionnaire (CASQ): A measure of students' attitudes related to service-learning
2010	Prentice & Robinson	Improving student learning outcomes with service learning
2011	Steinberg et al.	Civic-minded graduate: A north star (assessment tools)
2015	Campo	Una rúbrica para evaluar y mejorar los proyectos de aprendizaje servicio en la universidad [A rubric for assessing and improving service-learning projects at university]
2015	Batlle	Avaluació dels aprenentatges en els projectes d'aprenentatge servei [Assessment of learning in service-learning projects]
2015	Hébert & Hauf	Student learning through service learning: effects on academic development, civic responsibility, interpersonal skills and practical skills
2016	Gregorová et al.	The impact of service-learning on students' key competences
2017	Puig et al.	¿Cómo evaluar proyectos de aprendizaje servicio? [How can service-learning projects be assessed?]
2019	López-de-Arana et al.	Diseño y validación de un cuestionario para la autoevaluación de experiencias de aprendizaje-servicio universitario [Design and validation of a questionnaire for self-assessment of university service-learning experiences]
2019	Rodríguez-Izquierdo	Validación de una escala de medida del impacto del aprendizaje-servicio en el desarrollo de las competencias profesionales de los estudiantes en formación docente [Validation of a scale to measure the impact of service-learning on the development of the professional competences of teacher training students]
2020	León-Carrascosa et al.	Diseño y validación de un cuestionario para evaluar la metodología aprendizaje-servicio [Design and validation of a questionnaire to assess the service-learning methodology]
2020	Santos-Rego et al.	El aprendizaje-servicio y la educación universitaria [Service-learning and university education]
2023	Furco et al.	Service-Learning Quality Assessment Tool (SLQAT)

3. Results

The results of the analysis provide data that are very instructive for assessment of ECC. Half of the results are from Spain and the other half are from other countries, mainly the USA. These methods, with three exceptions (Eyler et al., 1997; Moely et al., 2002; Steinberg et al., 2011), are not specifically directed at assessing aspects of ECC but rather include these aspects as part of a more general assessment along with other types of dimensions, such as academic performance or the logistics of the project. Ten of them opt for a questionnaire format with multiple-choice answers or a Likert-type scale. Three choose the rubric format. Only the civic-minded graduate scale (Steinberg et al., 2011), which is one of the exceptions mentioned, uses a complex mixed assessment method combining various assessment techniques of different types, thus adding a rubric, a narrative analysis, and an interview to the CASQ instrument (Moely et al., 2002). The great majority of these methods are proposed as a summative assessment by the person leading an SL project of students participating in it, generally from higher education, without including the perspective of other agents such as the coordinators or participants from collaborating entities. In some cases, their use is also intended as an initial assessment, or both are combined as a pre-test/post-test.

Regarding the analysis of content relating to the ethical dimension, the most widely assessed skill is "reflexive capacity", which relates to critical thinking and the capacity to analyse the immediate environment in search of needs and their possible causes and solutions and self-analysis of one's own experiences, learnings, and training. On the other hand, there is little explicit coverage of the "sense of social justice", although it is included in the instruments of Eyler et al. (1997), Moely et al. (2002), and Herrera et al. (2011), as well as in the SLQAT questionnaire (Furco et al., 2023). In all of them, this subdimension centres on pro-equality attitudes, attitudes towards diversity, and the defence of human dignity. For its part, "capacity for judgement-deliberation" is considered in almost none of the instruments analysed and the only references found to this subdimension (Gregorová et al., 2016; León-Carrascosa et al., 2020) relate it to decision making skills. As for "self-knowledge", which only five instruments analyse (Campo, 2015; Hébert & Hauf, 2015; Gregorová et al., 2016; López-de-Arana et al., 2019; Rodríguez-Izquierdo, 2019), this focusses on questioning and comprehension of one's own skills for managing and development of the personality, as well as one's own cultural biases, stereotypes, and prejudices.

So, with regards to these subdimensions, we can identify some ethical aspects assessed to a lesser extent, such as the assessment of situations based on a system of values and virtues for taking decisions, self-criticism, identifying one's own cognitive processes and behaviour patterns, and the capacity for self-transformation starting from resignification and reidentification. Nonetheless, it is worth emphasising the proposal for assessment made by Rodríguez-Izquierdo (2019), which is directed at assessing future education professionals' development of professional competences using SL. This creates a scale whose elements are almost completely identified with ECC, and in most cases with the specific elements of the ethics subdimension.

If we compare this development of ethical assessment with the development of the civic dimension, an approach to assessment that largely focusses on the latter is apparent. In fact, although the three tools identified as being explicitly and exclusively dedicated to aspects relating to ECC include essential questions in ethical assessment such as "sense of social justice" or "critical and reflexive analysis" of the surrounding reality, they are actually conceived and centred principally on the exploration of skills and civic attitudes. In the case of Spain, the CUCOCSA questionnaire (Santos-Rego et al., 2020), the questionnaire developed by León-Carrascosa et al. (2020), and the rubric of Puig et al. (2017) are notable for the depth of their study of the civic dimension. The last of these stands out for dedicating two of the three categories of dynamisms of SL to questions relating to reflection, analysis of surroundings, social participation and awareness, and interpersonal relations. In the case of CUCOCSA, for the development of two of its four scales based on the aforementioned CASQ questionnaire and the CMG scale, thus providing a valuable adaptation for the assessment of civic-social and participatory competences in our context. For its part, the questionnaire by León-Carrascosa et al. (2020) investigates both the learning dimension and the service dimension, aspects related to reflection, decision making, participation, responsibility, and social awareness and communication.

Nonetheless, although, in a general sense, a greater weight is observed in civic assessment, there is something of an imbalance in the subdimensions analysed within this dimension. The majority of the instruments centre on performing a broad assessment of "interpersonal skills", including elements such as pro-sociality, collaborative work, the expression and listening communicative capacity, the dialogic capacity for negotiation, the search

for common goals, and the acceptance of different points of view, leadership, and empathetic capacity. The other pillar that supports assessment in this dimension is "social responsibility". In different cases analysed (Prentice & Robinson, 2010; Hébert & Hauf, 2015; Gregorová et al., 2016; Puig et al., 2017; Rodríguez-Izquierdo, 2019; León-Carrascosa et al., 2020), this is associated with increased awareness and sensitisation of the importance and influence of action and commitment of the individual as part of society, at a micro and macro level, on the causes of and improvements to social problems, on political events, and on care for the environment. On the contrary, aspects relating to "democratic citizenship" barely appear, associated almost solely with participation in matters from public life, which, for the most part, only affect the project developed. For its part, only one of the instruments analysed takes into account the "sense of belonging to the community" (Eyler et al., 1997). In this way, the civic aspects that are assessed less in the analysis relate to the civic matters of linking identity to one's own community, the perception of one's own space in it, active participation in public life, and the search for actions aimed at the common good.

4. Discussion and conclusions

The analysis carried out in this study has found gaps in the scientific-pedagogical literature relating to the lack of consensus and depth in ethical-civic assessment in SL. Also, some important approaches to take into account for future research in this sense, mainly focused on questions that are considered essential in the civic dimension of SL. The preference for assessment in this dimension could be because its principal subdimensions are often translated into observable behaviours by the individual in the community, since development in these dimensions only makes sense when we conceive of the subject in society, necessarily linked to others (Camps, 2005), unlike those related to the ethical dimension. Another hypothesis is that SL initiatives focus more on civics than ethics, in which case the development in this latter dimension would be more of an indirect consequence owing to the aforementioned joint development of both dimensions (given their interrelated nature) than the result of a specific and deliberate planning of learning outcomes for this purpose. It is also necessary to consider the fact that some authors might view civic assessment as an indirect measure of ethical development in SL, given that certain theoretical positions, such as those proposed by Arthur (2005), regard a degree of prior acquisition of ethical virtues as a prerequisite for the very existence of citizen development.

The results of this study are significant and enable progress from the instruments already developed to be able to move forwards in knowledge of and practice in this field and so strengthen the development of ECC in SL. Starting from these works, it is apparent that constructing a method that makes it possible to consider all of the subdimensions identified in this study in the areas of ethics and civics is necessary, especially in those that are developed to a lesser extent. Regarding the aspects that are represented less in the analysis performed, there is a striking contrast between their limited development in the assessment of SL and their large significance in theoretical literature on this topic, as in the case of the development of democratic citizenship, with SL being seen in this literature as one of the principal current proposals for citizenship education itself (Puig et al., 2011). Another example in the field of ethics would be self-knowledge, which starts to establish itself as one of the central elements of SL, especially in studies from Asia (Snell & Lau, 2020). Nonetheless, it is necessary to note that, while these two aspects are not included in standardised instruments like the ones analysed, they are sometimes assessed in parallel using other qualitative techniques developed on an ad hoc basis for each specific project, such as field diaries, discussion groups, interviews, or informal conversations.

Accordingly, this study concludes that the academic production of the last two decades shows that the assessment methods available for civic-ethic assessment of SL are insufficient, and so a new assessment method is needed. A method that can address this complex construct with precision by systematising the practice of assessment of this aspect to drive its progress in the scientific and social plane. All of this from a mixed methodological model that combines techniques for gathering and analysing information from different focuses and a multifocal character, making it possible to assess these dimensions from the joint perspective of all of the participating agents. In short, a method that, in line with Aramburuzabala et al. (2019), combines participatory and joint assessment with the complementary application of quantitative and qualitative tools. This new focus would permit a thick and thin description like the one Ryle (1971) described, which would be very valuable for revealing more about the effects of using SL on the development of ECC, both in the moment of its application and in its impact over time. Besides, it would enable the necessary realisation of longitudinal studies (Blanco-Cano & García-Martín, 2021) due to the consistency in the method.

It is important to consider a variety of difficulties that can arise when developing this method to assess ECC.

Firstly, there could be a difficulty in proposing an assessment method that standardises this assessment practice but can be adapted to the circumstantial characteristics of each project (such as, for example, the type of participants and contexts), making it possible to cover all of the socio-educational reality of the projects. Furthermore, standardisation itself would entail a difficult conceptual consensus around the elements that are encompassed in ECC that is not without controversy. Secondly, such an extensive assessment could result in a method that works poorly and so is unlikely to be put into practice because of lack of time and the different stresses that people who try to carry out a project of these characteristics often encounter (Palape et al., 2022). Finally, it would be necessary to increase the methodological training of the people who will coordinate this assessment (Aramburuzabala et al., 2019), both to apply information-gathering and analysis techniques and to integrate all of the data that derive from the different focuses applied and their interpretation with regard to the degree of development of the object studied.

Concerning the limitations of this study, we should note that although it selected tools published in high-impact journals mainly used in this sphere by other types of research, these might not fully reflect all of the tools existing for this purpose. There may be others that have been published outside the search criteria applied or that are used in educational practice but have not been collected in academic publications. Furthermore, the wide variety of formats, contexts, and aspects analysed in these tools means that it is hard to make comparisons between instruments that might be similar or equivalent in some aspects and complementary in other cases.

Ultimately, the ECC developed in SL is a highly complex construct and there is a lack of consensus around its conceptualisation and assessment caused by the challenges of diagnosing and measuring the characteristics that are inherent to the particular nature of this dimension of SL. All of this produces a dissonance with the significant and rapid expansion of this methodology and its practices in educational institutions all over the world. Despite these difficulties, development of the civic and ethical dimensions in the people who comprise our society creates a holistic educational pathway focused on full development of the individual, the common good, and social change (Bernal & Naval, 2023). This is why this research highlights the motivation and the need to develop a global assessment method that makes it possible to consider the immediate and long-term ethical-civic impact of SL projects in depth and with scientific rigour. This will enable an education that is more humane, engaged and connected to the social fabric and its needs, and to people's happiness and well-being.

References

Aiken, L. R. (1980). Content validity and reliability of single items or questionnaires. *Educational and Psychological Measurement, 40* (4), 955-959. https://doi.org/10.1177/001316448004000419

Alexander, H. A. (2016). Assessing virtue: Measurement in moral education at home and abroad. *Ethics and Education, 11* (3), 310-325. http://doi.org/10.1080/17449642.2016.1240385

Aramburuzabala, P., Gezuraga, M., & López de Arana, E. (2019). Cómo abordar la evaluación en los proyectos de aprendizaje-servicio [How to deal with evaluation in service-learning projects]. In M. Ruiz-Corbella, & J. García-Gutiérrez (Eds.), *Aprendizaje-servicio. Los retos de la evaluación [Service-learning. The challenges of evaluation]* (pp. 27-39). Narcea.

Arthur, J. (2005). The re-emergence of character education in British education policy. *British Journal of Educational Studies, 53* (3), 239-254. https://doi.org/10.1111/j.1467-8527.2005.00293.x

Batlle, R. (Coord.) (2015). *Avaluació dels aprenentatges en els projectes d'aprenentatge servei [Evaluation of learning in service-learning projects].* Fundació Jaume Bofill. https://aprenentatgeservei.cat/wp-content/uploads/guies/aps_avaluacio_aprenentatge-amb-annex.pdf

Bernal, A. (2020). Educación del carácter y de las emociones [Character and emotional education]. In C. Naval, A. Bernal, G. Jover, & J. L. Fuentes (Eds.), *Perspectivas actuales de la condición humana y la acción educativa [Current perspectives on the human condition and educational action]* (pp. 71-85). Dykinson.

Bernal, A., & Naval, C. (2023). El florecimiento como fin de la educación del carácter [Flourishing as the aim of character education]. **Revista Española de Pedagogía**, *81* (284), 17-32. https://doi.org/10.22550/REP81-1-2023-01

Blanco-Cano, E., & García-Martín, J. (2021). El impacto del aprendizaje-servicio (ApS) en diversas variables psicoeducativas del alumnado universitario: las actitudes cívicas, el pensamiento crítico, las habilidades de trabajo en grupo, la empatía y el autoconcepto. Una revisión sistemática [The impact of service-learning (SL) on various psychoeducational variables of university students: civic attitudes, critical thinking, group work skills, empathy and self-concept. A systematic review]. *Revista Complutense de Educación, 32* (4), 639-649. https://doi.org/10.5209/rced.70939

Bringle, R. G., & Clayton, P. H. (2021). Civic learning: A sine qua non of service learning. *Frontiers in Education, 6*, 1-14. https://doi.org/10.3389/feduc.2021.606443

Campo, L. (2015). Una rúbrica para evaluar y mejorar los proyectos de aprendizaje servicio en la universidad [A rubric for evaluating and improving university service-learning projects]. RIDAS, *Revista Iberoamericana de Aprendizaje-Servicio*, (1), 91-111. https://doi.org/10.1344/RIDAS2015.1.6

Camps, V. (2005). El sentido del civismo [The sense of civility]. Los monográficos de Barcelona. *Metròpolis Mediterrània*, (6), 15-21. https://articulateusercontent.com/rise/courses/xaMgwqn-2LaChXgyZ3b12f2MZG31M8WOY/VR95WmZC9sNUT6RA-l-3-20-m-1-20-el-20-sentido-20-del-20-civismo.pdf

Chiva, Ò., Capella, C., & Pallarès, M. (2018). Investigación-acción sobre un programa de aprendizaje-servicio en la didáctica de la educación física [Action-research on a service-learning program in teaching physical education]. *Revista de Investigación Educativa, 36* (1), 277-293. https://doi.org/10.6018/rie.36.1.270581

Curren, R., & Kotzee, B. (2014). Can virtue be measured? *Theory and Research in Education, 12* (3), 266-282. https://doi.org/10.1177/1477878514545205

Deeley, S. J. (2016). *El aprendizaje-servicio en educación superior. Teoría, práctica y perspectiva crítica [Service-learning in higher education. Theory, practice and critical perspective]*. Narcea.

Escobar-Pérez, & Cuervo-Martínez (2008). Validez de contenido y juicio de expertos: una aproximación a su utilización [Content validity and expert judgement: an approach to their use]. *Avances en Medición, 6*, 27-36. https://www.researchgate.net/publication/302438451

Esteban, F. (2015). Wilhelm von Humboldt, cardinal John Henry Newman and José Ortega y Gasset. Some thoughts on character education for today's university. *Journal of Character Education, 11* (1), 1-20.

Etzioni, A. (2001). *La tercera vía hacia una buena sociedad. Propuestas desde el comunitarismo [The third way to a good society. Proposals from communitarianism]*. Trotta.

Eyler, J., Giles, D. E., & Braxton, J. (1997). The impact of service-learning on college students. *Michigan Journal of Community Service Learning, 4* (1), 5-15. http://hdl.handle.net/2027/spo.3239521.0004.101

Fuentes, J. L. (2018). Educación del carácter en España: causas y evidencias de un débil desarrollo [Character education in Spain: Reasons and evidences of a weak development]. *Estudios sobre Educación, 35*, 353-371. https://doi.org/10.15581/004.35.353-371

Fuentes, J. L., Sirera, A., & Redondo-Corcobado, P. (2022). Toward a civically engaged teacher identity: Qualitative analysis of a service learning project in educators training. In A. Gromkowska-Melosik, B. Hordecki, & T. R. Szymczynski (Eds.), *In search of academic excellence. Social sciences and humanities in focus (vol. I)* (pp. 83-109). Peter Lang.

Furco, A. (2004). *El impacto educacional del aprendizaje-servicio. ¿Qué sabemos a partir de la investigación? [The educational impact of service-learning. What do we know from research?]* [PDF]. University of California-Berkeley. https://roserballe.files.wordpress.com/2009/02/resultats-investigacio-aps-furco-modo-de-compatibilidad.pdf

Furco, A., Brooks, S. O., Lopez, I., Matthews, P. H., Hirt, L. E., Schultzetenberg, A., & Anderson, B. N. (2023). Service-Learning Quality Assessment Tool (SLQAT). Journal of Higher Education Outreach and Engagement, 27 (2), 181-200. https://openjournals.libs.uga.edu/jheoe/article/view/3318/2954

García-Gutiérrez, J., Fuentes, J. L., & del Pozo, A. (2018). La promoción de la competencia ética y el compromiso cívico y su evaluación en los proyectos universitarios de aprendizaje-servicio [Promoting ethical competence and civic engagement and its assessment in university service-learning projects]. In M. Ruiz-Corbella, & J. García-Gutiérrez (Eds.), *Aprendizaje-servicio: los retos de la evaluación [Service-learning: The challenges of evaluation]* (pp. 118-133). Narcea.

González-Geraldo, J. L., Jover, G., & Martínez, M. (2017). La ética del aprendizaje servicio en la universidad: una interpretación desde el pragmatismo [The ethics of service learning at university: An interpretation from pragmatism]. Bordón. Revista de Pedagogía, 69 (4), 63-78. https://doi.org/10.13042/Bordon.2017.690405

Gregorová, A. B., Heinzová, Z., & Chovancová, K. (2016). The impact of service-learning on students' key competences. *International Journal of Research on Service-Learning and Community Engagement, 4* (1), 367-376. https://doi.org/10.37333/001c.29686

Harrison, T., Arthur, J., & Burn, E. (2016). *Character education evaluation handbook for schools*. Jubilee Centre for Character and Virtues.

Hébert, A., & Hauf, P. (2015). Student learning through service learning: Effects on academic development, civic responsibility, interpersonal skills and practical skills. *Active Learning in Higher Education, 16* (1), 37-49. https://doi.org/10.1177/1469787415573357

Ibáñez-Martín, J. A. (2021). La enseñanza de la filosofía y el cultivo de la inteligencia. Una segunda mirada al sentido crítico y al adoctrinamiento [Teaching philosophy and cultivating intelligence. A second look at critical thinking and indoctrination]. **Revista Española de Pedagogía**, *79* (278), 33-50. https://doi.org/10.22550/REP79-1-2021-11

Kristjánsson, K. (2015). *Aristotelian character education*. Routledge.

León-Carrascosa, V., Sánchez-Serrano, S., & Belando-Montoro, M.-R. (2020). Diseño y validación de un cuestionario para evaluar la metodología aprendizaje-servicio [Design and validation of a questionnaire to evaluate the service-learning methodology]. *Estudios sobre Educación, 39*, 247-266. https://doi.org/10.15581/004.39.247-266

López-de-Arana, E., Aramburuzabala, P., & Opazo, H. (2019). Diseño y validación de un cuestionario para la autoevaluación de experiencias de aprendizaje-servicio universitario [Design and validation of a questionnaire for self-assessment of university service-learning experiences]. *Educación XX1, 23* (1), 319-347. https://doi.org/10.5944/educxx1.23834

Martínez, M. (2010). Aprendizaje servicio y construcción de ciudadanía activa en la universidad: la dimensión social y cívica de los aprendizajes académicos [Service learning and the construction of active citizenship at university: the social and civic dimension of academic learning]. In M. Martínez (Ed.), *Aprendizaje servicio y responsabilidad social de las universidades [Service learning and the social responsibility of universities]* (pp. 11-26). Octaedro.

Martínez-Odría, A. (2007). Service-learning o aprendizaje-servicio. La apertura de la escuela a la comunidad local como propuesta de educación para la ciudadanía [Service-learning. Linking school and local community as a proposal for citizenship education]. *Bordón. Revista de Pedagogía, 59* (4), 627-640. https://recyt.fecyt.es/index.php/BORDON/article/view/36336

McLaughlin, T. H. (1992) Citizenship, diversity and education: A philosophical perspective. *Journal of Moral Education, 21* (3), 235-250. https://doi.org/10.1080/0305724920210307

Merino, C., & Livia Segovia, J. (2009). Intervalos de confianza asimétricos para el índice la validez de contenido: un programa visual basic para la V de Aiken [Confidence intervals for the content validity: A visual basic computer program for the Aiken's V]. *Anales de Psicología, 25* (1), 169-171. https://www.redalyc.org/pdf/167/16711594019.pdf

Moely, B., Mercer, S., Ilustre, V., Miron, D., & McFarland, M. (2002). Psychometric properties and correlates of the Civic Attitudes and Skills Questionnaire (CASQ): A measure of students' attitudes related to service-learning. *Michigan Journal of Community Service Learning, 8* (2), 15-26. http://hdl.handle.net/2027/spo.3239521.0008.202

Opazo, H., Ramírez, C., García-Peinado, R., & Lorite, M. (2015). La ética en el aprendizaje-servicio (ApS): un metaanálisis a partir de Education Resources Information Center (ERIC) [Ethics in service-learning (SL): A meta-analysis from Education Resources Information Center (ERIC)]. *Profesorado. Revista de currículum y formación del profesorado, 19* (1), 144-175. https://recyt.fecyt.es/index.php/profesorado/article/view/41027

Palape, I., Sepúlveda, G., Bizkarra, M. T., & Gamito, R. (2022). Luces y sombras del aprendizaje-servicio: dificultades y decisiones para poner en marcha los proyectos [Lights and shadows of the service-learning: difficulties and decisions to implement projects]. *RIDAS, Revista Iberoamericana de Aprendizaje Servicio, 13*, 1-19. https://doi.org/10.1344/RIDAS2022.13.1

Penfield, R. D., & Giacobbi, P. R. Jr. (2004). Applying a score confidence interval to Aiken's item content-relevance index. *Measurement in Physical Education and Exercise Science, 8* (4), 213-225. https://doi.org/10.1207/s15327841mpee0804_3

Pérez, C. (2016). *Educación en valores para la ciudadanía. Estrategias y técnicas de aprendizaje [Education in values for citizenship. Learning strategies and techniques]*. Desclée de Brouwer.

Pollack, S. S. (2015). Critical civic literacy as an essential component of the undergraduate curriculum. The case of California State University, Monterey Bay. In W. J. Jacob, S. E. Sutin, J. C. Weidman, & J. L. Yeager (Eds.), *Community engagement in higher education* (pp. 161-184). Sense Publishers. https://doi.org/10.1007/978-94-6300-007-9_10

Prentice, M., & Robinson, G. (2010). *Improving student learning outcomes with service learning*. American Association of Community Colleges. https://files.eric.ed.gov/fulltext/ED535904.pdf

Puig, J. M., Gijón, M., Martín, X., & Rubio. L. (2011). Aprendizaje-servicio y educación para la ciudadanía [Service-learning and citizenship education]. *Revista de Educación*, (n.º extraordinario), 45-67. https://www.ub.edu/GREM/wp-content/uploads/Aps-y-educación-para-la-ciudadan.pdf

Puig, J., Martín, X., & Rubio, L. (2017). ¿Cómo evaluar proyectos de aprendizaje servicio? [How to evaluate service learning projects?]. *Voces de la Educación, 2* (4), 122-132. https://www.revista.vocesdelaeducacion.com.mx/index.php/voces/article/view/72

Quintana, J. M. (1988). *Teoría de la educación. Concepción antinómica de la educación [Theory of education. Antinomic conception of education]*. Dykinson.

Redondo-Corcobado, P., & Fuentes, J. L. (2020). La investigación sobre el aprendizaje-servicio en la producción científica española: una revisión sistemática [Research on service learning in Spanish scientific production: A systematic review]. *Revista Complutense de Educación, 31* (1), 69-82. https://doi.org/10.5209/rced.61836

Redondo-Corcobado, P., & Fuentes J. L. (2022). Desarrollo ético-cívico en el aprendizaje-servicio: un análisis desde la filosofía de la educación a través del pensamiento comunitarista de Amitai Etzioni [Ethical-civic development in service-learning: An analysis from the philosophy of education through the communitarian thinking of Amitai Etzioni]. *Estudios sobre Educación, 43*, 29-46. https://doi.org/10.15581/004.43.002

Rodríguez-Izquierdo, R. M. (2018). Aprender a pensar críticamente a través de la metodología de aprendizaje-servicio (ApS) [Learning to think critically through service-learning (SL) methodology]. In L. Torres (Coord.), *Innovación docente: nuevos planteamientos [Teaching innovation: new approaches]* (pp. 55-63). Octaedro.

Rodríguez-Izquierdo, R. M. (2019). Validación de una escala de medida del impacto del aprendizaje-servicio en el desarrollo de las competencias profesionales de los estudiantes en formación docente [Validation of a scale to measure the impact of service-learning on development of professional competences in students in teacher training]. *Revista Mexicana de Psicología, 36* (1), 63-73. https://www.redalyc.org/articulo.oa?id=243058940006

Ryle, G. (1971). *Collected essays 1929-1968*. Routledge.

Salam, M., Awang Iskandar, D. N., Ibrahim, D. H. A., & Farooq, M. S. (2019). Service learning in higher education: A systematic literature review. *Asia Pacific Education Review, 20* (4), 573-593. https://doi.org/10.1007/s12564-019-09580-6

Santos-Rego, M. A., Lorenzo, M., & Mella, I. (2020). *El aprendizaje-servicio y la educación universitaria. Hacer personas competentes [Service-learning and university education. Making competent people]*. Octaedro.

Skjong, R., & Wentworth, B. (2001). Expert judgement and risk perception. In International Society of Offshore and Polar Engineers (Ed.), *Proceedings of the Eleventh International Offshore and Polar Engineering Conference (Stavanger, Norway, June 17-22, 2001) (vol. IV)* (pp. 537-544). https://www.researchgate.net/publication/265032303_Expert_Judgment_and_Risk_Perception

Smith, R. (2022). Character education and the instability of virtue. *Journal of Philosophy of Education, 56* (6), 889-898. https://doi.org/10.1111/1467-9752.12692

Snell, R. S., & Lau, K. H. (2020). The development of a Service-Learning Outcomes Measurement Scales (S-LOMS). *Metropolitan Universities, 31* (1), 44-77. https://doi.org/10.18060/23258

Steinberg, K., Hatcher, J., & Bringle, R. G. (2011). *Civic-minded graduate: A north star (assessment tools)*. Indiana University and Purdue University. https://scholarworks.iupui.edu/handle/1805/2667

Stith, M., Anderson, T., Emmerling, D., Malone, D., Sikes, K., Clayton, P., & Bringle, R. (2021). Designing service-learning to enhance social justice commitments: A critical reflection tool. *Experiential Learning & Teaching in Higher Education, 4* (2), 9-17. https://nsuworks.nova.edu/elthe/vol4/iss2/6

Tapia, M. N. (2010). Calidad académica y responsabilidad social: el aprendizaje servicio como puente entre dos culturas universitarias [Academic quality and social responsibility: Service learning as a bridge between two university cultures]. In M. Martínez (Ed.), *Aprendizaje servicio y responsabilidad social de las universidades [Service learning and the social responsibility of universities]* (pp. 27-56). Octaedro.

Zayas, B., Gozálvez, V., & Gracia, J. (2019). La dimensión ética y ciudadana del aprendizaje servicio: una apuesta por su institucionalización en la educación superior [The ethical and civic dimension of service learning: A model for its institutionalization in higher education]. *Revista Complutense de Educación, 30* (1), 1-15. https://doi.org/10.5209/RCED.55443

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Development of computational thinking through BlocksCAD, Blockly and problem-solving in mathematics

Desarrollo del pensamiento computacional a través de BlocksCAD, Blockly y la resolución de problemas en matemáticas

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Abstract:

The development of computational thinking has become one of the educational priorities in several countries around the world. In this article, two experiences are described in which two block programming tools are used. The first experience only used BlocksCAD, while the second added the use of Blockly and the work on some mathematical algorithms in a maths classroom. The number of participants in the experience was twenty-eight in the group that only used Blocky and thirteen in the group that combined the use of both tools, all of them of the third year of secondary education (between 14 and 15 years old) in a school in Spain. The results show that, although the use of BlocksCAD alone allows an increase in the development of CT, if other resources such as Blockly are also used in the mathematics classroom, the effect is multiplied. In addition, considering the satisfaction results of the participants in the experience, together with the possibility of printing their own creations through 3D modelling (a fact claimed by the students themselves), this encourages us to continue using both tools and even to try to combine them with other tools and to design experiences that encompass entire academic courses or, at least, entire trimesters.

Keywords: computational thinking, problems, mathematics, mathematical modelling, technologies, BlocksCAD, Blockly, Secondary, Spain, education, 3D printing, group comparison, satisfaction.

Resumen:

El desarrollo del pensamiento computacional se ha convertido en una de las prioridades educativas en varios países del mundo. En este artículo, se describen dos experiencias en el aula en las que se utilizan dos herramientas de programación por bloques. En la primera, solo se empleó BlocksCAD. En la segunda, se trabajó, además, con Blockly y con varios algoritmos matemáticos. El número de participantes en la experiencia fue de veintiocho en el grupo que solo utilizó Blockly y de trece en el que combinó el uso de ambas herramientas. Todos ellos cursaban tercero de educación secundaria (entre 14 y 15 años) en un colegio de España. Los resultados muestran que, si bien el uso de BlocksCAD ha permitido, por sí solo, incrementar el desarrollo del PC, la combinación con otros recursos como Blockly en el aula de matemáticas puede multiplicar su efecto. Además, los participantes expresaron su satisfacción con la experiencia. Como propuesta de futuro, se plantea la posibilidad de que el alumnado pueda imprimir sus propias creaciones mediante modelado 3D, algo que ellos mismos pidieron. Esto nos animaría a seguir utilizando ambas herramientas e, incluso, a intentar combinarlas con otras y diseñar experiencias que abarquen cursos académicos o, al menos, trimestres completos.

Palabras clave: pensamiento computacional, problemas, matemáticas, modelado, tecnologías, BlocksCAD, Blockly, secundaria, España, educación, impresión 3D, comparación de grupos, satisfacción.

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1. Introduction

In a society like the current one, in continuous change, digital literacy acquires its full potential and training in the technological field is essential for future students so they can respond to the challenges that society will face. Moreover, the introduction of educational technology in the Spanish system is clear in recent years (Vargas-Quesada et al., 2023). It is for this reason that in the nineties the term STEM (science, technology, engineering and mathematics) emerged at the NSF (National Science Foundation) in the United States, which encompasses the four areas of knowledge that are worked on in the scientific and technological fields. This model arises from the work of Seymour Papert in the eighties on the development of thinking in childhood, artificial intelligence and computer technologies for education in order to train future professionals to meet the demands of society.

There are many studies that propose working under the STEM model in classrooms (including Andersen, 2014; Orcos & Magreñán, 2018; Robinson, et al. 2014; Schroth & Helfer, 2017; Tofel-Grehl & Callahan, 2017). That is why curricula must evolve towards the inclusion of practices based on the implementation and development of strategies that help to promote critical thinking and talent among students in the scientific-technological field (Miedijensky & Tal, 2016).

Digital literacy has evolved from what Paul Glister (1997) proposed in the late 1990s, the ability to understand and use information from many digital sources, towards computational thinking (from now on, CT). More and more studies based on classroom strategies at all academic levels show the effectiveness of the work of CT in securing achievements in the STEM field.

In the field of 3D modelling and printing, more and more computer programs being developed with increasingly simple interfaces so that they can be used by different age ranges in an intuitive way.

In this paper, a proposal is presented to work on CT in a class of third-year secondary education students through the use of BlocksCAD, a 3D modelling and printing tool. In this work, we worked with two groups of students: one made up of twenty-eight students, who only used BlocksCAD software, and another with thirteen students, who also used Blockly for two hours a week while studying mathematics. BlocksCAD is a tool that is gaining more and more weight in secondary education classrooms due to its ease of use. Its block programming and the fact that it is a very visual program make it a very useful and comprehensive tool for entry-level CT. The proposal that has been worked on consists of seven one-hour sessions that include a pre-test on knowledge of CT, several sessions of directed work with BlocksCAD, a final practical activity in which students had to integrate the acquired knowledge and the completion of a post-test and a satisfaction survey.

A study by Beltrán-Pellicer and Muñoz-Escolano (2021) explored the modelling of shapes such as spheres, cubes or tori in the environment with BlocksCAD, collecting the steps, rotations, translations, etc., carried out and finding two main difficulties: the complexity of the interface for not so simple objects and the ignorance of procedures. As a result of this experience developed for geometry work, the authors considered that the tool could be useful for the future work of CT. It is for this reason that research is needed into the potential of BlocksCAD.

The objectives of this study are to improve the development of CT in a sample of third-year compulsory secondary education students through the use of BlocksCAD and to compare the results obtained when using only said software or when combining its use with Blockly in a Maths Extension classroom.

2. Theoretical framework

This section contains the theoretical framework that supports this article. It begins with a description of CT. Afterwards, its relation to the STEM field and problem-solving is analyzed, as well as its use in the classroom with 3D modelling programs. Finally, the tools used in this study are described.

2.1. Computational thinking (CT)

As Wing (2006) comments, CT "is a fundamental competence for everyone, not just for programmers" (p. 33). Wing defines CT as problem-solving, systems design and an understanding of human behaviour through fundamental computer concepts.

CT does not refer only to the ability to program as it implies thinking at different levels of abstraction, which is why it applies to many contexts of everyday life. It is also based on the STEM model (science, technology, engineering and mathematics), since, when this

type of thinking is performed, many other skills are also developed (Dapozo et al., 2017).

Zapata-Ros (2015) emphasises that CT is a specific thought in which

> coding skills are the most visible part of a way of thinking that is valid not only in this area of mental activity, which supports the development and creation of programs and systems [...]. It is a way of thinking about the analysis and relationship of ideas, organization, and logical representation. Those skills are favoured with certain activities and with certain learning environments from the earliest stages. It is about the development of a specific thought: computational thinking. (p. 1)

As Keith et al. (2019) comment, "CT can be thought of as a broad foundation consisting of the heuristics used by computer scientists and as a way to think about the diverse thinking skills associated with computing" (p. 225). As such, it should not only be developed by scientists, but by everyone, since it encourages logical and critical development.

Wing (2008) talks about CT as a type of analytical thinking that has a lot to do with mathematical problem-solving skills. In both, the following skills are promoted (Csizmadia et al., 2015): logical thinking (making decisions to reach the result or product by applying mathematical operators), abstraction (translating a problem into mathematical language), algorithmic thinking (applying a sequence of steps to arrive at a solution through codes) and some pattern recognition (identifying parts, similarities and connections and using them to achieve the fastest solution).

2.2. CT and 3D modelling in the classroom

It was not until the beginning of the 21st century that the need to implement the STEM model in classrooms was seen due to the rapid technological boom and the need for specialists in this area (Sanders, 2009).

Tissenbaum et al. (2019) show that, as students learn about computing, they should have the opportunity to create through it in a way that has a direct impact on their lives and on the community. To do this, they need to have access to platforms and learning environments to make their designs to develop digital empowerment (Freire, 1993; Thomas & Velthouse, 1990).

Tissenbaum et al. (2019) indicate that CT training requires that students should feel responsible for articulating and designing their solutions, rather than working towards predetermined "correct" answers (p. 35). Moreover, students need to feel that their work is authentic in relation to the broader computing and engineering communities, practices and products. Furthermore, a significant number of activities have to be situated in contexts that are authentic and personally relevant. In addition, students should feel that their work has the potential to have an impact on their own lives or their community, and they should feel capable of pursuing new computing opportunities because of their current work.

A systematic study by Ting-Chia et al. (2018) highlights that, on the one hand,

> CT activities are primarily introduced in courses in program design, computer science, biology and robot design. CT is a skill that could be widely applied in the living environment rather than being used exclusively by computer engineers. On the contrary, it is a skill that deserves a positive attitude in daily life. (p. 308)

On the other hand, they emphasise that

> most of the research focuses on project-based learning, problem-based learning, cooperative learning and game-based learning, so, future research should attempt to introduce different learning strategies, including scaffolding learning strategies, storytelling, learning and aesthetic experience, among others, in order to assist learners in multiple ways in terms of subject development or high-level skills training, that is, training in critical thinking and problem-solving skills. (p. 308)

Grover and Pea (2018) discuss CT concepts and practices for classrooms similar to those discussed above. These concepts include logic and logical thinking, algorithms and algorithmic thinking, patterns and their recognition, abstraction and generalisation, evaluation and automation.

In relation to evaluation, models and simulations must be evaluated from the point of view of whether they are correct and suitable for the mission to be achieved, in addition to other aspects such as simplification or speed. Çoban and Korkmaz (2021) show that, when evaluating CT in classrooms, validated and reliable instruments must be designed that allow for the level of achievement of these components or skills to be assessed. Tang et al. (2020), in their systematic study on the evaluation of CT in classrooms, stress that

> high school students, college students, and teachers and professional development programs need more CT assessments; most CT assessments focus on student programming or computer skills; traditional tests and performance assessments are often used to assess CT skills, and surveys are used to measure students' CT dispositions; more reliability and validity evidence should be collected and reported in future studies. (p. 1)

Regarding automation, Wing (2008) comments that computing is the automation of abstraction. Among the processes considered, problem decomposition, computational artifact creation, testing and debugging, iterative refinement and collaboration and creativity are included. The author concludes that CT can be integrated into many subjects and contexts.

CT is worked on in the classroom through different software such as Scratch, Lego EV3 and others that are generating a lot of motivation among students (Howland et al., 2019; Resnick et al., 2009; Jocius et al., 2021). However, as Tikva and Tambouris (2021) comment, there is no curricular conceptualisation about CT and, for this reason, many teachers fail when they introduce it in the classroom (Lee et al., 2020). As such, the best way to integrate it is through STEM disciplines, as reflected in many studies based on the construction of models and computational simulations to understand and study scientific phenomena (Hansen et al., 2015; Karaahmetoğlu & Korkmaz, 2018; Sengupta et al., 2013; Wilensky et al., 2014).

Bull et al. (2015) explain that computer design projects that involve physical prototypes such as 3D modelling can provide a basis for improving the learning process in science and mathematics. 3D printers applied to mathematics education constitute a resource that allows for the proposal of activities that involve inquiry learning or learning based on problem-solving (Wang et al., 2019).

As Ford and Minshall (2019) comment, "the emergence of additive manufacturing and 3D printing technologies is introducing industrial skills deficits and opportunities for new teaching practices in a range of subjects and educational settings" (p. 1). In their systematic study, they state that when introducing 3D modelling in classrooms, the following is required: teaching both teachers and students about 3D printing, teaching design skills and creativity, as well as methodologies to promote its development; producing models that facilitate learning and create assistive technologies. As Blikstein (Blikstein et al., 2017) points out, the use of 3D modelling in classrooms also has a positive impact in that it provides opportunities for different learning styles.

A study by Jiang and Li (2021) on the impact of Scratch on CT digital competence in primary education shows its need for integration with other areas such as mathematics to promote a significant development of computational skills through contextualized problems. For its part, the secondary education study by Sen et al. (2021) collects an experience based on the implementation of Lego EV3 software and Tinkercad for 3D modelling. The results show that the use of this type of software and 3D modelling encourages students to carry out effective critical thinking during the development of designs that were original, but, at the same, time realistic. In the same vein, the study by Roscoe et al. (2014) explores the combination of Minecraft and 3D modelling, and there are many studies aimed at describing improvements in creativity (Craddok, 2015; Kostakis et al. 2015), technical drawing (Lütolf, 2013), product design (Chao et al., 2017; Steed & Wevers, 2016), mathematical achievement (Stansell et al., 2015) and, more specifically, in the field of geometry (Corum & Garofalo, 2015; Huleihil, 2017).

2.3. BlocksCAD and Blockly tools

The appliance of technology in the classroom has been a key research topic in recent years (Cox et al., 2022; Prendes-Espinosa & Cartagena, 2021; Wijers et al., 2010). The benefits of its use have been shown, as long as it is planned and the characteristics of both the class and the content to be worked on are considered. Furthermore, students value in a really positive way the use of didactic resources based on technology to improve their teaching-learning process (Medina et al., 2013). Moreover, there are different technology-based methodologies that have shown positive results in mathematics, such as flipped classroom (Orcos et al., 2020; Wei et al., 2020) and gamification (Fuentes-Cabrera et al., 2020; Jiménez et al., 2020; Magreñán et al., 2023), and the use of technology in mathematics classrooms has been studied extensively (Kaufmann et al., 2000; Korenova, 2017; Meadows & Caniglia, 2019; Orcos et al., 2022; Zulnaidi et al., 2020). In this paper, we are interested in the use of two different softwares: BlocksCAD and Blockly.

BlocksCAD is a free block programming tool that eliminates the obstacle that textual syntax can pose in programming (Beltrán-Pellicer et al., 2020), making it

very similar to Scratch. As Solomen Menashi, project director of BlocksCAD, explains, its origins lie in the need to create software that is intuitive like Lego but with the power and precision of real modelling software (Berdik, 2017).

As Chytas et al. (2018) say, "however even free block-based parametric tools like BlocksCAD and Beetle Blocks can support the creation of sophisticated projects which include algorithmic concepts to generate complex geometries" (p. 1976). In their study on BlocksCAD, they use the terms "parametric design" as an algorithmic process to build relationships between complex geometries and structures. They conclude that CT is not fostered solely through programming activities and can and should be combined with design and other STEM topics to solve challenging engineering designs.

A study by Beltrán- Pellicer and Muñoz- Escolano (2021) explores the modelling of shapes such as spheres, cubes or tori in the environment with BlocksCAD, collecting the steps, rotations, translations, etc., carried out and obtaining interesting results by improving reflection, spatial capacity, etc.

On the other hand, the use of game-based learning is gaining more and more followers due to the proven benefits of its use in different branches, including mathematics and programming and even in course design (Huang & Hew, 2021). In this sense, serious games have proven to be very valuable tools in programming learning (Frankovic et al., 2018). There are different serious games such as the Blockly Games tool, which has proven to be a good tool to understand block programming since it allows users to work with loops, conditionals or nesting sub-stacks, for example, but they must have a concrete plan (Fraser, 2014). Thanks to certain particularities of this tool, such as having several levels in each game, not requiring registration or being able to use it from any device with an internet connection, it is already beginning to be used in primary education classrooms (Alonso, 2021). In addition, some of the games on this tool have given satisfactory results in terms of the perceptions of students of different ages (De Figueredo et al., 2019).

3. Methodology

In this section, the methodology used in this study is shown, including a description of the group of participants involved in the experience, the activities that the students did during the experience, the information tools used to collect information and the analysis of the collected data.

This work is descriptive, using a descriptive, inferential and interpretive quantitative methodology, since the results obtained by the participants in the required constructions and the types of structures that have been used to make them are analysed. In addition, after the experience, a satisfaction survey was completed by the students to gauge their impressions regarding the use of the program and its capacity for teaching in mathematics classrooms, so the answers given are also presented and analysed.

3.1. Participants

The participants in this experience are from the third year of secondary education in a school located in Spain. The total number is forty-one participants was divided into two groups: one group that was studying the Mathematics Extension subject, made up of thirteen students, and another that was not studying this subject, made up of twenty-eight students. The group of participants was selected from among those who carried out the complete experience and who spent, at least, ten minutes on both the initial and the final test, plus the time to fill in the personal data and examples, to avoid copying or answering at random. The age range of the participants was between 14 and 15 years, as seen in Table 1. The group that worked exclusively with BlocksCAD is called G1, while the group that worked with both tools is called G2. The total number of students is called G.

TABLE 1. Descriptive analysis of the participants in the experience.

Group	Boys	Girls	Total
G1	$n = 12$ Mean of age=14.083	$n = 16$ Mean of age=14.188	$n = 28$ Mean of age=14.050
G2	$n = 9$ Mean of age=14.222	$n = 4$ Mean of age=14.000	$n = 13$ Mean of age=13.933
G	$n = 21$ Mean of age=14.143	$n = 20$ Mean of age=14.150	$n = 41$ Mean of age=14.146

3.2. Experience development

As previously mentioned, this study involves two groups of students who participated in different experiences, but both based on the use of BlocksCAD. Next, they will be described, starting first with the common part of both.

The experience begins with a validated pre-test, which was developed by Román-González et al. (2015) and that can be found in Román (2015). This test, designed to be carried out with students up to the second year of secondary education in Spain (that is to say, the year immediately prior to the one in this study), showed that the participants had a low level of CT. So, this experience was developed to improve it. It is important to remember that this group of students was affected by the Covid-19 pandemic and they could not work on CT due to the lockdowns.

Once the students' level of CT was detected, two well differentiated groups were observed: those with a low level of CT and those with a medium level. Therefore, the decision was made to design these intervention proposals and adapt them to each group to improve their level of CT.

As already mentioned, for the G1 group, the experience was carried out with just BlocksCAD and consisted of five differentiated sessions of one hour each. This group reached the lower level in the pre-test (17.14 out of a possible 28 points). Each of the sessions are shown below.

In the first session, the fundamental idea is for students to become familiar with the BlocksCAD tool and its menu options, including how to save, how to load and ways to create or retrieve creations. This can be seen at the top of Figure 1.

Figure 1. BlocksCAD main interface.

In addition, in this first session, students worked with the first constructions associated with the creation of shapes in 3D and 2D that the program allows and that are shown in Figures 2 and 3.

Figure 2. Simple 3D shapes allowed in BlocksCAD.

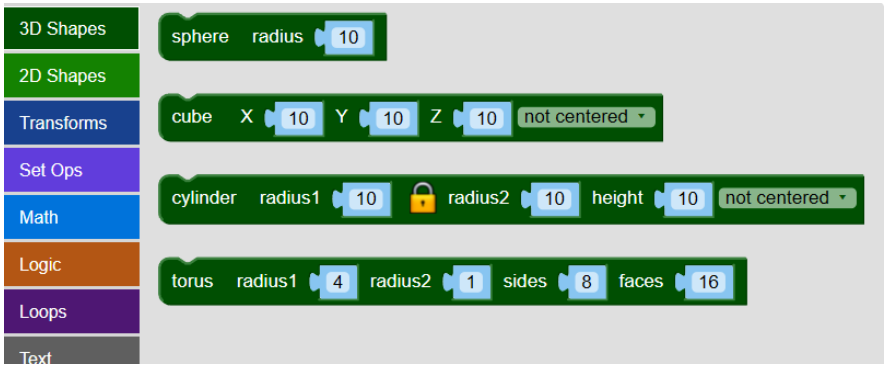
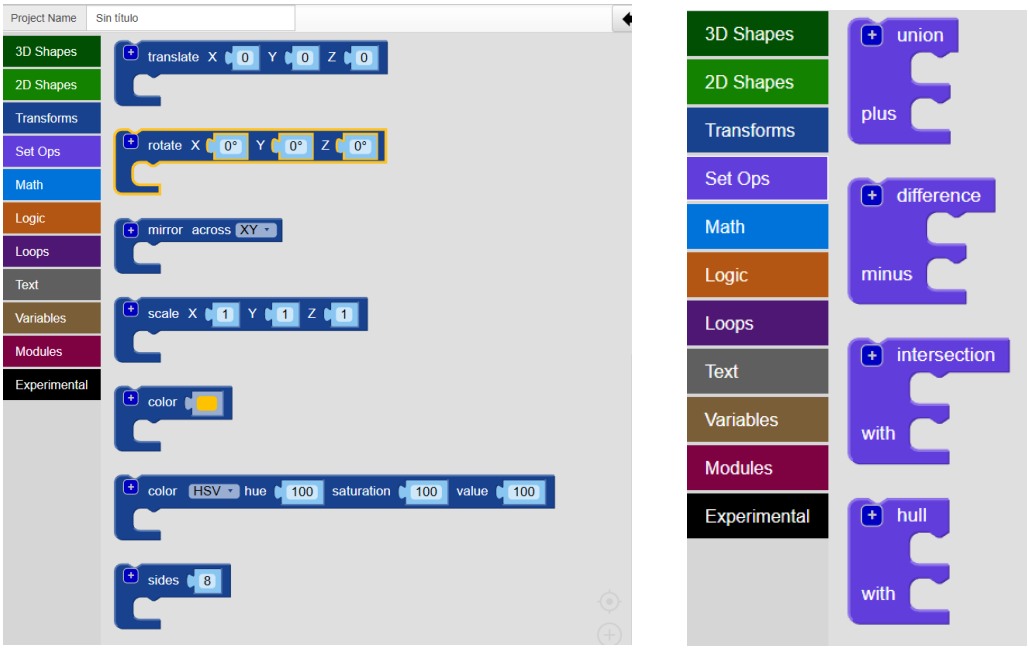


Figure 3. Simple 2D shapes allowed in BlocksCAD.

In the second session of guided work with BlocksCAD, the students had to work with the main options in the "Transforms" menu and those in the set operations menu that are shown in Figure 4.

FIGURE 4. Main operations in the "Transforms" menu in BlocksCAD (left) and operations in the set operations menu (right).



These two sessions were considered the first block of work with BlocksCAD, which was carried out over the course of a week. For the second block, which included three sessions, the participants worked on the different math menus and logic blocks (Figure 5), loops and variables (Figure 6), and, finally, functions (Figure 7). The first two sessions were based on working on all the menus mentioned above except for the functions, that were performed in the third session.

FIGURE 5. "Math" menu operations (left) and "Logic" menu operations (right).

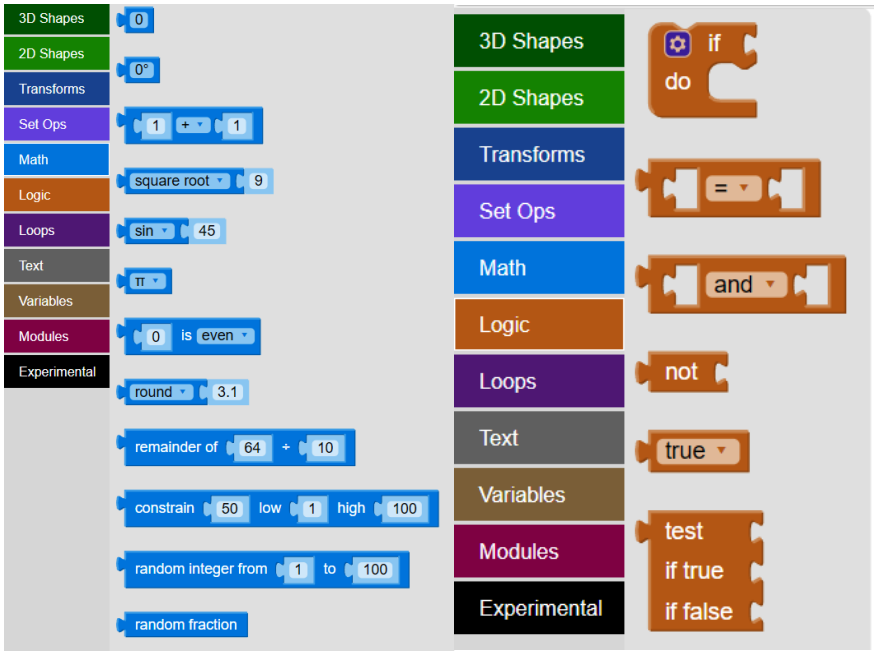


FIGURE 6. "Loops" menu operations (left) and "Variables" menu operations (right).

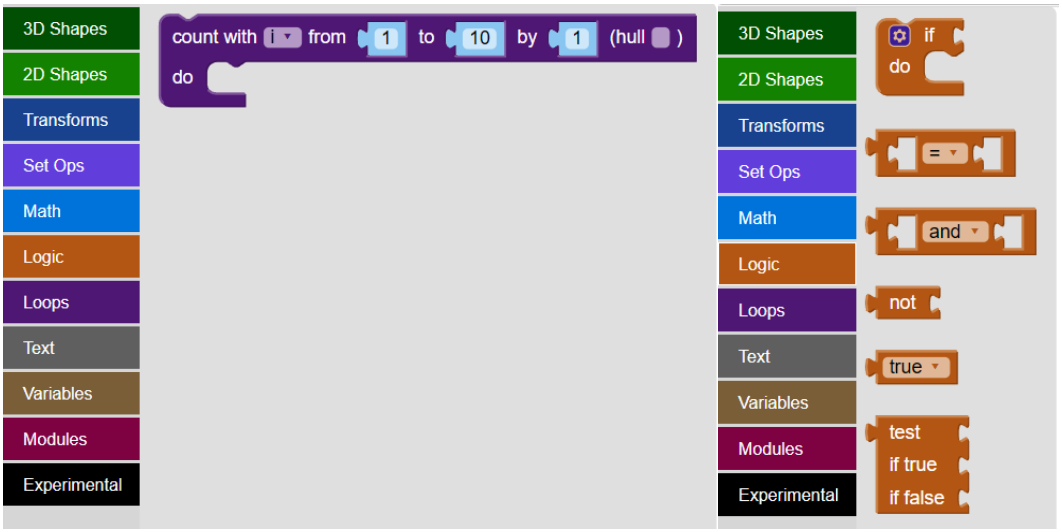
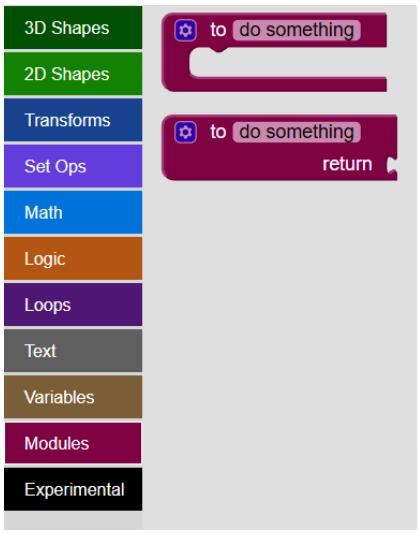


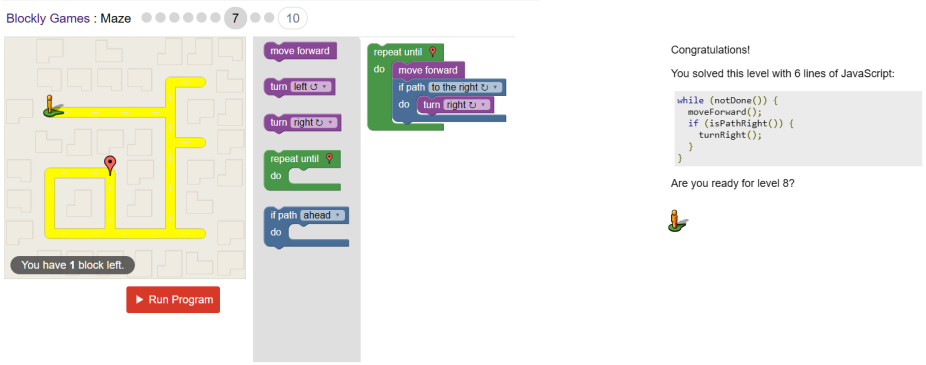
FIGURE 7. "Modules" menu operations that allow you to create in BlocksCAD.



To finish, the third block consisted of two more sessions: the first, where students had to deliver a construction applying BlocksCAD, which required the use of CT; and the second, where they repeated the CT test and completed the satisfaction survey.

In addition, the G2 group, during that time, worked in the Math Extension classroom with Blockly Games, where there are different mazes to be solved by means of sequence blocks, similar to BlocksCAD. In addition, they identified the steps to take in some mathematics' algorithms, such as solving an equation of second degree or the division algorithm. An example of a screen in Blockly can be seen in Figure 8.

FIGURE 8. Example of one of the Blockly Games, with the final solution.



Source: https://blockly.games/maze?lang=en&level=7&skin=0

3.3. Information collection tools

To obtain information to analyse whether the use of these tools has been effective in improving CT, different information tools have been used, which are listed below:

- The CT assessment test designed by Román-González et al. (2015) has been used as the pre-test. This test consists of twenty-eight questions with a single valid answer, and it has a maximum completion time of forty-five minutes. The questions link the use of conditionals, loops and functions, among other aspects.
- To measure the performance of the students in the first two blocks, they had to deliver exercises 1 and 2 shown below.
- In addition, to measure the degree of understanding of the commands, students had to deliver a final task shown below.
- On the other hand, the post-test used was the same as the pre-test, since the answers were not provided to the students.
- Finally, to find out the students' impressions of the experience, a satisfaction survey was completed, which is shown below and is an adaptation of the one used by San Cristobal et al. (2017).

Exercise 1. Perform the following tasks:

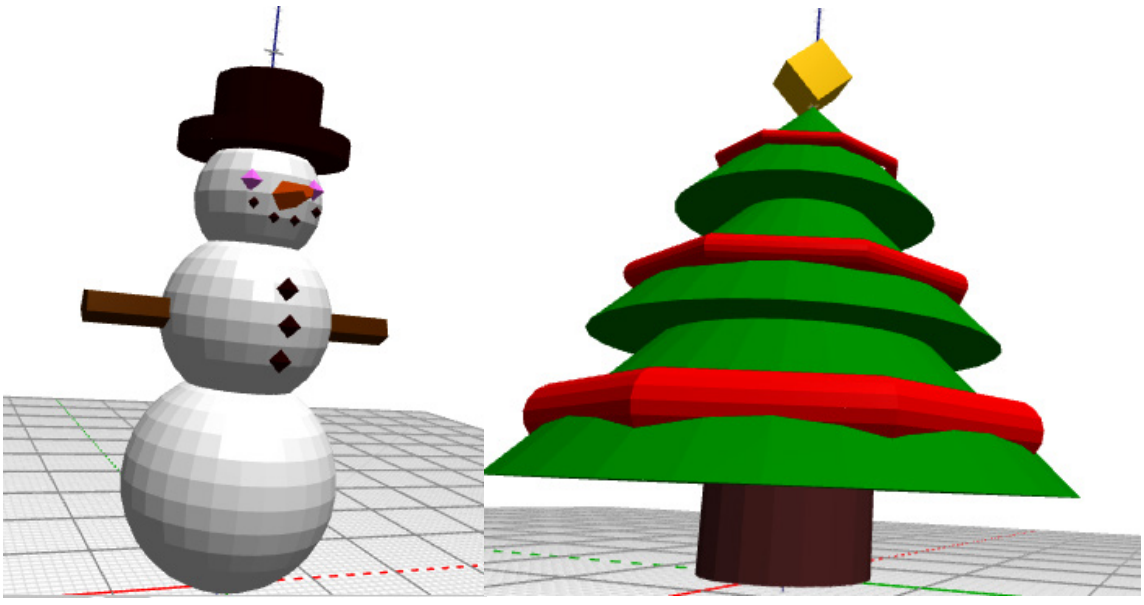
- Build a sphere with radius 5 and paint it yellow.
- Draw a cube with dimensions 10 × 8 × 3.
- Draw a cylinder.
- Draw a cone and a truncated cone.
- Build a pile of three coloured spheres of radius 10 that touch at one point.
- Build a stack of three cylinders with heights 10 and radius 10, 8 and 6.
- Draw a cone, on top of a truncated cone and on top of a sphere, each one of a different colour and touching at a single point.
- Build a white ring like the one in the image.
- Build three ice creams like the ones in the image, but with different flavours.
- Build a yo-yo.

Exercise 2. Perform the following tasks:

- Try to paint ten cubes that alternate between green and red.
- Now, instead of cubes, paint spheres that do not intersect (touch at one point).
- Now build it with cubes that are floating (that is, the *z* coordinate is greater than 0).
- Make a flag in two colours.
- Now make the flag fill the entire screen.
- Try to build a chess board with cubes (remember it is an 8 × 8 board and that, when the sum of the row
- and the column is even, it is coloured and, when it is odd, it is white).
- Build two trees, one like the one in the example and the other with a black treetop.
- Fill in the axis by interspersing green treetops and black treetops.
- Make the design of a castle with four towers.
- Now design the "brick" function and build a wall of bricks of different colours.

Final task. Create the following models (Figure 9)

FIGURE 9. Some of the models created by the students.



Satisfaction survey

Part 1 questions:

- Q1: Did you already know about the program?
  - ○ Yes
  - ○ No
- Q2: Would you like to do more classes like this?
  - ○ Yes
  - ○ No

Questions with answers 1 to 10:

- Q3: How much did you like the experience?
- Q4: Has the program made learning more enjoyable?
- Q5: I liked this class more than a "traditional" class.
- Q6: I think the learning is more active and experience-based.
- Q7: I have more possibilities to work at my own pace.
- Q8: I have fun while learning.
- Q9: How capable do you think you are of making a 3D model?

Likert-type questions:

- Q10: How much did you learn/remember in class?
  - ○ Nothing
  - ○ Little
  - ○ Enough
  - ○ A lot

Open-ended questions:

- Q11: Do you have any other comments?

3.4. Data analysis

Firstly, to detect the level of each group and to carry out the intervention more appropriately, a descriptive analysis of the students' scores in the pre-test was performed. Secondly, to observe if the improvement seen in both groups is significant, Student's *t* tests were performed for groups related to the global group and the G1 group. Then, the non-parametric test Wilcoxon W was performed to obtain the difference between the pre-test and the post-test. Moreover, the size effect was also computed to compare the results obtained in both groups. Afterwards, a descriptive analysis of the survey responses was performed, also showing some links between some of the answers. Finally, a descriptive study was done of the marks obtained in both deliverables; of the possible correlations between the marks for both pieces of work, the final exam and the results of the post-test; and of the difference in scores obtained.

4. Results and discussion

The results obtained by the total group (G), both in the pre-test and in the post-test, as well as in the BlocksCAD exam, are presented in this section and then studied separately. Finally, he results of the satisfaction survey are analysed.

4.1. Total group results

Table 2 shows the results obtained by the students belonging to the total group (G), in the different deliverables for the tasks.

TABLE 2. Descriptive analysis of the results obtained by the participants in the experience in the different tasks.

Statistics	Task 1	Task 2	Final task
Mean	7.649	8.988	8.207
Median	7.100	9.000	8.000
Mode	6.700	10.000	8.000

Therefore, it is observed that the results related to the use of iterations, functions, variables and conditionals are quite positive, especially in task 2. In addition, in the final task, the average grade is higher than 8, which is an indicator that they have understood what they have worked on.

Regarding the pre-test and post-test results shown in Table 3, it can be deduced that there is a mean difference of 2.366, higher in the post-test.

In light of the results in Table 3, the Student's *t* test for comparison of means for related groups was performed. The results of which are shown in Table 4.

It is observed that, in general, in the total group, the post-test mean is 2.366 points higher than the pre-test mean, which is a significant difference. In addition, two different definitions were used to calculate the effect size obtained in the experience in the total group. The first, used by Morris (2008) and Morris & DeShon (2002), was defined by the difference of means between the post-test and the pre-test divided by the standard deviation of the marks in the pre-test (D1). The second consisted of dividing the difference of means between pre-test and post-test by the square root of the means of the variations (D2). The results are shown in Table 5, where it is observed that the effect size of the results obtained is medium in size.

TABLE 3. Average of the results obtained in the pre-test and the post-test.

Group	Pre-test mean	Post-test mean
G	18.34	20.71

TABLE 4. Results of the Student's *t* test for related groups.

Group	Par	Mean difference	Value of *t*	Sig. (bilateral)
G	Pre-test - Post-test	-2.366	-4.295	0.000

TABLE 5. Effect sizes obtained from experience.

Group	Variance pre-test	Variance post-test	D1	D2
G	18.680	24.962	0.547	0.506

Consequently, considering the whole group of students, who used one or both of the aforementioned tools, it can be observed that the average of correct answers obtained in the test improves significantly. Moreover, according to the effect size, the results obtained regarding the acquisition of CT in the sample improved in general. These results allow for the use of these tools to be considered in schools in order to work on CT in mathematics classes with students in the third year of compulsory secondary education.

4.2. Results of each group separately

In this section, the same statistics for each group separately as for the entire group are shown. Table 6 shows the results obtained by the students who worked only with BlocksCAD (G1) and by those who combined it with Blockly (G2).

TABLE 6. Descriptive analysis of the results obtained by the participants in the experience in the different tasks.

Group	Statistics	Task 1	Task 2	Final task
G1	Mean	7.268	8.839	7.8393
	Median	7.100	8.500	8.000
	Mode	6.700	8.000	8.000
G2	Mean	8.469	9.308	9.000
	Median	9.600	10.000	9.000
	Mode	10.000	10.000	8.000

Therefore, it is observed that the results related to the use of iterations, functions, variables and conditionals are quite positive, again especially in task 2. In addition, in the final task, the average grade in both groups is 8 or 9, which is an indicator that the students have understood what they were working on.

Regarding the pre-test and post-test results shown in Table 7, it appears there is an improvement in both groups, although these are uneven. In the group that just used BlocksCAD, the improvement is two points, while, in the group that combined the use of BlocksCAD with the use of Blockly Games, the improvement is four points.

TABLE 7. Rank sum of the Wilcoxon test (post-test- pre-test).

Group	Ranks (positive-negative-equal)	Mean Rank (positive-negative)
G1	17-5-6	12.06-9.60
G2	11-1-1	6.95-1.50

In light of the results in Table 7 and considering there are no parametric assumptions, the Wilcoxon *W* test for comparison for related groups was carried out to compare the results and draw conclusions. The results obtained using SPSS are shown in Table 8.

TABLE 8. Results of the Wilcoxon *W*.

Group	Par	Value of *Z*	Sig. (bilateral)
G1	Pre-test - Post-test	-2.564	0.010
G2	Pre-test - Post-test	-2.944	0.003

The results show that there are significant differences in both cases, with a significance level of 0.05. On the other hand, and as previously mentioned, the difference in the group of students who combined the use of BlocksCAD and Blockly Games is greater than in the group who only worked with BlocksCAD, which also improved the results significantly. In addition, as non-parametric statistics have been used, the effect size in the experience for both groups have been obtained throught a matched-pairs rank biserial correlation coefficient, which is considered a measure of effect size for the Wilcoxon signed-rank test (King et al., 2018). The results can be seen in Table 9.

TABLE 9. Effect sizes obtained from the experience.

Group	Variance pre-test	Variance post-test	RBCC
G1	16.423	20.840	0.1000
G2	14.744	3.859	0.6513

Therefore, it is observed that the effect size of the obtained results is much greater in group G2, which indicates that the combined use of both tools in the sample gives better results.

Consequently, considering each group separately, the results show that there is an improvement in both cases, which is greater in the group that worked with the combined tools. This fact can strengthen the argument that the use of these tools can help to improve the acquisition of CT in mathematics classrooms with students in the third year of compulsory secondary education. Finally, in the group who worked with both tools, the effect size is notably greater than the effect size in the group who only worked with BlocksCAD. As such, in the considered sample, it seems that the combined use of both tools gives better results.

4.3. Satisfaction survey results

This section presents the results of the satisfaction survey provided to the students after the completion of the test. Firstly, the response values of questions Q1 and Q2 are shown in Table 10. These results show that there is not a big difference between the two groups regarding the percentage of students who knew about the program and those who would like to do more similar classes using it.

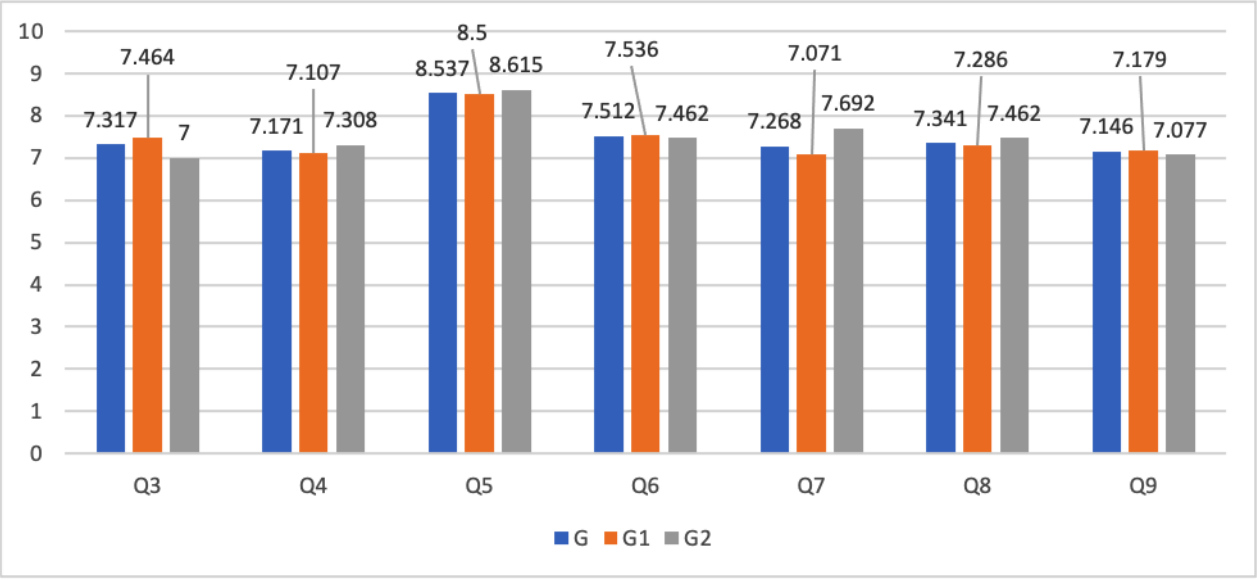
TABLE 10. Answers to questions Q1 and Q2 of the satisfaction survey.

Group	% of positive responses to Q1	% of positive responses to Q2
G	12.2%	80.5%
G1	10.7%	82.1%
G2	15.4%	76.9%

On the other hand, Figure 10 shows the means of the responses to questions Q3-Q9. Once again, these results show how there are no great differences between the two groups and that, in addition, the students' evaluations of the experience are positive.

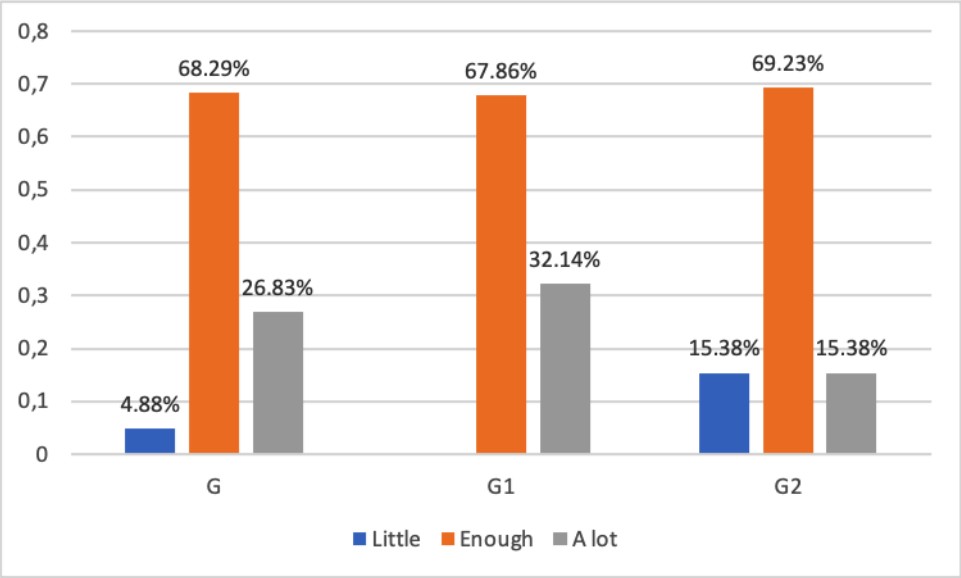
From Figure 10, it can be concluded that, in general, the students liked the experience and that they think the program or programs made their learning more enjoyable. It is also notable that they prefer this type of class to traditional classes, as seen in the responses to Q5, with a result greater than 8.5 in mean. On the other hand, it is clear from the responses to Q6 and Q8 that the learning is more active and that the students had fun while working and learning, an aspect that is really interesting for the teacher community. Furthermore, the responses given by students to Q7 show that they think they have more possibilities to work at their own pace and not be hurried or dependent on the rhythm of the class. Finally, from the responses given to Q9, students think they are now capable of making 3D models, which was one of the objectives of this study.

FIGURE 10. Average responses of students to questions Q3-Q9.



Finally, with respect to question 10, the data for which can be seen in Figure 11, it appears that there is no great difference between the answers given to the question "How much have you learned?". In both groups, the percentage of those who think "little" is low, while the predominant response, by a significant margin, was "enough". Also striking is the fact that, for students who only worked with BlocksCAD, the answer "little" does not appear, so their feeling is that, at least, they have learned "enough".

FIGURE 11. Average responses of students to question Q10.



On the other hand, some of the answers given by the students in the open-ended question stand out since they appear repeated on several occasions. Based on these responses, it is clear that the students liked the experience, a fact that has been verified by the responsible teacher:

- "I really liked this activity because I found it very fun and interesting, it has further developed my creativity."
- "I liked being able to work with the instructions to be able to create more complex models later."
- "I liked being able to work with the instructions to later create more complex models."

On the other hand, there were other answers that were not so positive but that should also be taken into account. For example:

- "I liked it although some models took me a while to make."
- "I need more time to do what is asked in class."

Finally, it also highlights that the students claimed to print their own creations in order to have them at home.

5. Conclusions

The experience that has been described, and that lasted for seven sessions, combines different skills that students have to acquire. These include mathematical skill, which encompasses CT, a key interest in this paper due to its importance in our society, together with technological skill. On the other hand, by involving different subjects which combine all the previous skills, such as mathematics or information and communication technologies (which are highly interrelated), the STEM field is worked on, as has already been presented by authors such as Lee et al. (2020) or Robinson et al. (2014); even the STEAM field is worked on, adding the artistic aspect that allows 3D modelling.

By way of conclusion, it was found that the work with BlocksCAD helped with the acquisition of CT in the group of students in the sample. This conclusion was already intuited in works by authors such as Beltrán-Pellicer et al. (2020) or Beltrán-Pellicer and Muñoz-Escolano (2021), who show how this tool can be introduced in mathematics classrooms. The results obtained in this study exposes that, in the sample used, in general, the students improved their CT capacity.

Moreover, it was proven that the combined use of BlocksCAD and Blockly Games, as well as the work of mathematical algorithms from a Blockly perspective, helped the acquisition of CT, even reaching very large effect sizes. This indicates that not only can the acquisition of CT be worked on with BlocksCAD but that, in combination with other tools, its effect can be multiplied. Using Blockly Games, which is essentially a game where students work through a series of steps to find the solution to a problem, allows them to develop CT, as already mentioned by Roscoe et al. (2014).

Furthermore, from the responses to the satisfaction survey, it can be seen that students liked the experience and that it helped them in different ways, as they felt the learning process was more enjoyable and more active, and they had fun during the experience. They also felt they could work at their own pace, which was a really important aspect for them, and that they were now able to make 3D model, which was one of the main objectives of the study. Finally, they expressed that they really prefer this kind of class to traditional ones.

Considering all the answers and the results obtained by the students, the objectives of this study have been achieved. These aims were to improve the development of computational thinking in a sample of third-year secondary school students through the use of BlocksCAD and to compare the results obtained when using only said software or when combining its use with Blockly in a maths extension classroom. Furthermore, although it was not an objective of the study as such, good satisfaction results have been obtained from the experience. This is a very positive aspect that, together with the rest of the objectives, supports the idea that, with good planning, the use of both tools can help in the development of CT.

In terms of future work, it is felt it would be even more beneficial to choose to print some of the pieces designed in the classroom. This could be seen as an incentive for students, and even more so in light of the Covid-19 pandemic, which is having a negative effect on student motivation, an aspect that is corroborated by the work of Lütolf (2013) and Kostakis et al. (2015).

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References

Alonso, R. (2021). *Blockly games y su influencia en el desarrollo del pensamiento computacional para los estudiantes de quinto año de la U.E. Carlos María de la Condamine [Blockly games and their influence on the development of computational thinking for fifth year students at U. E. Carlos María de la Condamine]* [Master's thesis]. Repositorio Digital UNACH, Universidad Nocional de Chimborazo. http://dspace.unach.edu.ec/handle/51000/8310

Andersen, L. (2014). Visual-spatial ability: Important in STEM, ignored in gifted education. *Roeper Review*, *36* (2), 114-121. https://doi.org/10.1080/02783193.2014.884198

Beltrán-Pellicer, P., Rodríguez-Jaso, C., & Muñoz-Escolano, J. M. (2020). Introduciendo BlocksCAD como recurso didáctico en matemáticas [Introducing BlocksCAD as a teaching resource in mathematics]. *Suma, 93,* 39-48. https://bit.ly/3Ah2aka

Beltrán- Pellicer, P., & Muñoz-Escolano, J. M. (2021). Una experiencia formativa con BlocksCAD con futuros docentes de matemáticas en secundaria [A training experience using BlocksCAD with future high school teachers of mathematics]. *Didacticae*, (10), 71-90. https://doi.org/10.1344/did.2021.10.71-90

Berdik, C. (2017). Kids code their own 3D creations with new blocks-based design program. *Tech Directions; Ann Arbor*, *76* (9), 23-24.

Blikstein, P., Harel, I., Machover, T., y Upitis, R. (2017, 26 de enero). Rethinking school [video]. *Thinking about Thinking about Seymour*. MIT Media Lab, Cambridge, Massachusetts, EE. UU. https://www.media.mit.edu/videos/seymour-2017-01-26/

Bull, G., Haj-Hariri, H., Atkins, R., & Moran, P. (2015). An educational framework for digital manufacturing in schools. *3D Printing and Additive Manufacturing*, *2* (2), 42-49. https://doi.org/10.1089/3dp.2015.0009

Chao, J., Po, H. Chang, Y., & Yao, L. (2017). The study of 3D printing project course for indigenous senior high school students in Taiwan. In T. H. Meen, S. D. Prior, & A. D. Kin-Tak (Eds.), *Proceedings of the IEEE International Conference on Advanced Materials for Science and Engineering (IEEE-ICAMSE 2016), Tainan, Taiwan, 12-13 November 2016* (pp. 68-70). Institute of Electrical and Electronics Engineers. https://doi.org/10.1109/ICAMSE.2016.7840234

Chytas, C., Diethelm I., & Tsilingiris, A. (2018). Learning programming through design: An analysis of parametric design projects in digital fabrication labs and an online makerspace. In *Proceedings of 2018 IEEE Global Engineering Education Conference (EDUCON2018)* (pp. 1978-1987). Institute of Electrical and Electronics Engineers. https://doi.org/10.1109/EDUCON.2018.8363478

Çoban, E., & Korkmaz, Ö. (2021). An alternative approach for measuring computational thinking: Performance-based platform. *Thinking Skills and Creativity, 42,* 100929. https://doi.org/10.1016/j.tsc.2021.100929

Corum, K., & Garofalo, J. (2015). Using digital fabrication to support student learning. *3D Printing and Additive Manufacturing*, *2* (2), 50-55. https://doi.org/10.1089/3dp.2015.0008

Cox, F. T., González, D., Magreñán, Á. A., & Orcos, L. (2022). Enseñanza de estadística descriptiva mediante el uso de simuladores y laboratorios virtuales en la etapa universitaria [Teaching of descriptive statistics using simulators and virtual laboratories at university level]. *Bordón: Revista de pedagogía*, *74* (4), 103-123. https://doi.org/10.13042/BORDON.2022.94121

Craddock, I. L. (2015). Makers on the move: A mobile makerspace at a comprehensive public high school. *Library Hi Tech*, *33* (4), 497-504. https://doi.org/10.1108/LHT-05-2015-0056

Csizmadia, A., Curzon, P., Dorling, M., Humphreys, Simon, Ng, T., Selby, C., & Woollard, J. (2015). *Computational thinking. A guide for teachers*. Computing at School. https://eprints.soton.ac.uk/424545/

Dapozo, G. N., Greiner, C. L., Petris, R. H., Espíndola, M. C., & Company, A. M. (2017). Promoción del pensamiento computacional para favorecer la formación de recursos humanos en disciplinas STEM [Promoting computational thinking to foster human resource development in STEM disciplines]. In *WICC 2017. XIX Workshop de Investigadores en Ciencias de la Computación* (pp. 737-742). Instituto Tecnológico de Buenos Aires.

De Figueiredo, M. P. S., De Oliveira, E. G., & Filho, G. A. De A. C. (2019). Intervenção em turmas de jovens e adultos numa escola da rede pública do Recife, multidisciplinaridade e uso da ferramenta Blockly Games: um relato de experiência [Intervention in youth and adult classes in a public school in Recife, multidisciplinarity and the use of the Blockly Games tool: An experience report]. In *Anais do IV Congresso sobre Tecnologias na Educação* (pp. 561-567). SBC. https://doi.org/10.5753/ctrle.2019.8932

Ford, S., & Minshall, T. (2019). Where and how 3D printing is used in teaching and education. *Additive Manufacturing, 25,* 131-150. https://doi.org/10.1016/j.addma.2018.10.028

Frankovic, I., Hoic-Bozic, N., & Prskalo, L. N. (2018). Serious games for learning programming concepts. In *Proceedings 2012 IEEE International Conference on Systems, Man, and Cybernetics (SMC)* (p. 354). Institute of Electrical and Electronics Engineers. https://doi.org/10.1109/ICSMC.2012.6378001

Fraser, N. (2015). Ten things we've learned from Blockly. In F. Turbak, D. Bau, J. Gray, C. Kelleher, & J. Sheldon (Eds.), *2015 IEEE Blocks and Beyond Workshop (Blocks and Beyond)* (pp. 49-50). Institute of Electrical and Electronics Engineers. https://doi.org/10.1109/BLOCKS.2015.7369000

Freire, P. (1993). *Pedagogy of the oppressed.* Continuum

Fuentes-Cabrera, A., Parra-González, M. E., López-Belmonte, J., & Segura-Robles, A. (2020). Learning mathematics with emerging methodologies - The escape room as a case study. *Mathematics*, *8* (9), 1586, 1-14. https://doi.org/10.3390/math8091586

Glister, P. (1997). *Digital literacy*. Wiley.

Grover, S., & Pea, R. D. (2018). Computational thinking: A competency whose time has come. In S. Sentance, E. Barendsen, & C. Schulte (Eds.), *Computer science education: Perspectives on teaching and learning in schools* (pp. 19-38). Bloomsbury Academic.

Hansen, A. K., Iveland, A., Dwyer, H. Harlow D. B., & Franklin, D. (2015). Programming science digital stories: Computer science and engineering design in the science classroom. *Science and Children*, *53* (3), 60-64.

Howland, K., Good, J., Robertson, J., & Manches, A. (2019). Special issue on computing thinking and coding in childhood. *International journal of child-computer interaction*, *19*, 93-95. https://doi.org/10.1016/j.ijcci.2018.11.001

Huang, B., & Hew, K. F. (2021). Using gamification to design courses. *Educational Technology & Society*, *24* (1), 44-63.

Huleihil, H. (2017). 3D printing technology as innovative tool for math and geometry teaching applications. *IOP Conference Series: Materials Science and Engineering*, *164*, 012023. http://doi.org/10.1088/1757-899X/164/1/012023

Jiang, B. & Li, Z. (2021). Effect of Scratch on computational thinking skills of Chinese primary school students. *Journal of Computers in Education*, *8*, 505-525. https://doi.org/10.1007/s40692-021-00190-z

Jiménez, C., Arís, N., Ruiz, Á. A. M., & Orcos, L. (2020). Digital escape room, using Genial.Ly and a breakout to learn algebra at secondary education level in Spain. *Education Sciences*, *10* (10), 1-14. https://doi.org/10.3390/EDUCSCI10100271

Jocius, R., O'Byrne, W. I., Albert, J., Joshi, D., Robinson, R., & Andrews, A. (2021). Infusing computational thinking into STEM teaching. *Educational Technology & Society*, *24* (4), 166-179.

Karaahmetoğlu, K., & Korkmaz, Ö. (2019). The effect of project-based arduino educational robot applications on students' computational thinking skills and their perception of basic STEM skill levels. *Participatory Educational Research (PER)*, *6* (2). http://dx.doi.org/10.17275/per.19.8.6.2

Kaufmann, H., Schmalstieg, D., & Wagner, M. (2000). Construct3D: A virtual reality application for mathematics and geometry education. *Education and Information Technologies*, *5*, 263-276. https://doi.org/10.1023/A:1012049406877

Keith, K., Sullivan, F., & Pham, D. (2019). Roles, collaboration, and the development of computational thinking in a robotics learning environment. In S. C. Kong, & H. Abelson (Eds.), *Computational thinking education* (pp. 223-245). Springer. https://doi.org/10.1007/978-981-13-6528-7_13

Korenova, L. (2017). GeoGebra in teaching of primary school mathematics. *International Journal for Technology in Mathematics Education*, *24* (3), 155-160.

Kostakis, V., Niaros, V., & Giotitsas, C. (2015). Open source 3D printing as a means of learning: An educational experiment in two high schools in Greece. *Telematics and Informatics*, *32* (1), 118-128. https://doi.org/10.1016/j.tele.2014.05.001

Lee, I., Grover, S., Martin, F., Pillai, S., & Malyn-Smith, J. (2020). Computational thinking from a disciplinary perspective: Integrating computational thinking in K-12 science, technology, engineering and mathematics education. *Journal of Science Education and Technology*, *29* (1), https://doi.org/10.1007/s10956-019-09803-w

Lütolf, G. (2013). Using 3D printers at school: the experience of 3drucken.ch. In E. Canessa, C. Fonda, M. Zennaro (Eds.), *Low-cost 3D printing for science, education and sustainable development* (pp. 149-158). The Abdus Salam International Centre for Theoretical Physics (ICTP).

Magreñán, Á. A., Jiménez, C., Orcos, L., & Roca, S. (2022). Teaching calculus in the first year of an engineering degree using a digital escape room in an online scenario. *Computer Applications in Engineering Education*. https://doi.org/10.1002/CAE.22568

Meadows, M. L., & Caniglia, J. C. (2019). Using PhET simulations in the mathematics classroom. *The Mathematics Teacher*, *112* (5), 386-389. https://doi.org/10.5951/mathteacher.112.5.0386

Medina, L., Jaquez, J., Noguez, J., & García, R. M. (2013). Newton Gymlab: gimnasio-laboratorio virtual de física y matemática [Newton Gymlab: virtual physics and mathematics gymnasium-laboratory]. Instituto Tecnológico y Estudios Superiores de Monterrey. http://hdl.handle.net/11285/621356

Miedijensky, S., & Tal, T. (2016). Reflection and assessment for learning in science enrichment courses for the gifted. *Studies in Educational Evaluation*, *50*, 1-13. https://doi.org/10.1016/j.stueduc.2016.05.001

Morris, S. B. (2008). Estimating effect sizes from pretest-posttest-control group designs. *Organizational Research Methods*, *11* (2), 364-386. https://doi.org/10.1177/1094428106291059

Morris, S. B., & DeShon, R. P. (2002). Combining effect size estimates in meta-analysis with repeated measures and independent-groups designs. *Psychological methods*, *7* (1), 105-125. https://doi.org/10.1037/1082-989x.7.1.105

Orcos, L., & Magreñán, Á. A. (2018). The hologram as a teaching medium for the acquisition of STEM contents. *International Journal of Learning Technology*, *13* (2), 163-177. https://doi.org/10.1504/IJLT.2018.092097

Orcos, L., Cordero, A., Jordán, C., Magreñán, Á. A., Sanabria, E., & Torregrosa, J. R. (2020). Reverse teaching as a methodological strategy for mathematics learning in higher education. En Á. A. Magreñán (Ed.), *Didactics of mathematics: New trends and experiences* (pp. 153-180). Nova Science Publishers.

Orcos, L., Jiménez, C., & Magreñán, Á. A. (2022). Itinerarios de aprendizaje para trabajar la probabilidad matemática en futuros maestros en un escenario *online* con Deck.Toys [Learning itineraries to work mathematic probability with future teachers in an online scenario with Deck.Toys tool]. *RIED: Revista Iberoamericana de Educación a Distancia*, *25* (2), 195-218. https://doi.org/10.5944/ried.25.2.31748

Prendes-Espinosa, M. P., & Cartagena, F. C. (2021). Tecnologías avanzadas para afrontar el reto de la innovación educativa [Advanced technologies to face the challenge of educational innovation]. *RIED, Revista Iberoamericana de Educación a Distancia*, *24* (1), 35-53. https://doi.org/10.5944/ried.24.1.28415

Resnick, M., Maloney, J., Monroy-Hernández, A., Rusk, N. Eastmond, E., Brennan, K., Millner, A., Rosenbaum, E., Silver, J., Silverman, B., & Kafai, Y. (2009). Scratch: Programming for all. *Communications of the ACM, 52* (11), 60. https://doi.org/10.1145/1592761.1592779

Robinson, A., Dailey, D., Hughes, G., & Cotabish, A. (2014). The effects of a science-focused STEM intervention on gifted elementary students' science knowledge and skills. *Journal of Advanced Academics, 25* (3), 189-213. https://doi.org/10.1177/1932202X14533799

Román, M. (2015). *Test de pensamiento computacional [Computational thinking test]*. Retrieved on January 15, 2024 from http://goo.gl/IYEKMB

Román-González, M., Pérez-González, J. C., & Jiménez-Fernández, C. (2015, October 14-16). *Test de pensamiento computacional: diseño y psicometría general [Computational thinking test: design & general psychometry]* [conference paper]. III Congreso Internacional sobre Aprendizaje, Innovación y Competitividad (CINAIC 2015), Madrid, España.

Roscoe, J. F., Fearn, S., & Posey, E. (2014). Teaching computational thinking by playing games and building robots. In *Proceedings of 2014 International Conference on Interactive Technologies and Games iTAG 2014* (pp. 9-12). The Institute of Electrical and Electronics Engineers. https://doi.ieeecomputersociety.org/10.1109/iTAG.2014.15

San Cristóbal, M. S., Martín, D., Asencio, E. N., & Figueroa, J. T. (2017). Flipped classroom y didáctica de las matemáticas en la formación *online* de maestros de educación infantil [Flipped classroom and mathematics didactics in online education of early childhood teachers]. *Revista Electrónica Interuniversitaria de Formación del Profesorado*, *20* (3), 1-14.

Sanders, M. (2009). STEM, STEM education, STEMmania. *The Technology Teacher.* https://www.teachmeteamwork.com/files/sanders.istem.ed.ttt.istem.ed.def.pdf

Schroth, S. T., & Helfer, J. A. (2017). Gifted & green: Sustainability/environmental science investigations that promote gifted children's learning. *Gifted Child Today, 40* (1), 14-28. https://doi.org/10.1177/1076217516675903.

Sen, C., Ay, Z. S., & Kiray, S. A. (2021). Computational thinking skills of gifted and talented students in integrated STEM activities based on the engineering design process: The case of robotics and 3D robot modelling. *Thinking Skills and Creativity, 42,* 100931. https://doi.org/10.1016/j.tsc.2021.100931

Sengupta, P., Kinnebrew, J. S. Basu, S., Biswas G., & Clark, D. (2013). Integrating computational thinking with K-12 science education using agent- based computation: A theoretical framework. *Education and Information Technologies, 18* (2), 351-380. https://doi.org/10.1007/s10639-012-9240-x

Stansell, A., & Tyler-Wood, T. (2016). Digital fabrication for STEM projects: A middle school example. In J. M. Spector, C. Tsai, D. G. Sampson, Kinshuk, R. Huang, N. Chen, & P. Resta (Eds.), *Proceedings of the IEEE 16th International Conference on Advanced Learning Technologies* (pp. 483-485). The Institute of Electrical and Electronics Engineers. https://doi.org/10.1109/ICALT.2016.44

Steed, M., & Wevers, M. (2016). 3D printing & the design process: A pilot project between university student teachers and grade four students. In *Proceedings of EdMedia 2016 - World Conference on Educational Media and Technology* (pp. 354-359). Association for the Advancement of Computing in Education.

Tang, X., Yin, Y., Hadad, R., & Zhai, X. (2020). Assessing computational thinking: A systematic review of empirical studies. *Computers & Education*, *148*, 103798. https://doi.org/10.1016/j.compedu.2019.103798

Thomas, K. W., & Velthouse, B. A. (1990). Cognitive elements of empowerment: An "interpretive" model of intrinsic task motivation. *Academy of Management Review*, *15* (4), 666-681. https://psycnet.apa.org/doi/10.2307/258687

Tikva, C., & Tambouris, E. (2021). Mapping computational thinking through programming in K-12 education: A conceptual model based on a systematic literature review. *Computers and Education*, *162*, 104083. https://doi.org/10.1016/j.compedu.2020.104083

Ting-Chia H., Shao-Chen C., & Yu-Ting H. (2018). How to learn and how to teach computational thinking: Suggestions based on a review of the literature. *Computers & Education*, *126*, 296-310. https://doi.org/10.1016/j.compedu.2018.07.004

Tissenbaum, M., Sheldon, J., & Abelson, H. (2019). From computational thinking to computational action. Envisioning computing education that both teaches and empowers. *Communications of the ACM, 62* (3), 34-36. https://doi.org/10.1145/3265747

Tofel-Grehl, C., & Callahan, C. M. (2017). STEM high schools teachers' belief regarding STEM student giftedness. *Gifted Child Quarterly*, *61* (1), 40-51. https://doi.org/10.1177/0016986216673712

Vargas-Quesada, B., Zarco, C., & Cordón, O. (2023). Mapping the situation of educational technologies in the Spanish university system using social network analysis and visualization. *International Journal of Interactive Multimedia and Artificial Intelligence*, *8* (2), 190-201. https://doi.org/10.9781/ijimai.2021.09.004

Wang, T. H., Lim, K. Y., Lavonen, J., & Clark-Wilson, A. (2019). Maker-centred science and mathematics education: Lenses, scales and contexts. *International Journal of Science and Mathematics Education*, *17* (1), 1-11. https://doi.org/10.1007/s10763-019-09999-8

Wei, X., Cheng, I. L., Chen, N. S., & Yang, X., Liu, Y., Dong, Y., Zhai, X., & Kinshuk. (2020). Effect of the flipped classroom on the mathematics performance of middle school students. *Educational Technology Research and Development*, *68*, 1461-1484. https://doi.org/10.1007/s11423-020-09752-x

Wijers, M., Jonker, V., & Drijvers, P. (2010). MobileMath: Exploring mathematics outside the classroom. *ZDM, The International Journal on Mathematics Education*, *42* (7), 789-799. https://doi.org/10.1007/s11858-010-0276-3

Wilensky, U., Brady C. E., & Horn, M. S. (2014). Fostering computational literacy in science classrooms. *Communications of the ACM*, *57* (8), 24-28. https://doi.org/10.1145/2633031

Wing, J. M. (2006). Computational thinking. *Communications of the ACM*, *49* (3), 33-35. https://doi.org/10.1145/1118178.1118215

Wing, J. M. (2008). Computational thinking and thinking about computing. *Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences*, *366* (1881), 3717–3725. https://doi.org/10.1098/rsta.2008.0118

Zapata-Ros, M. (2015). Pensamiento computacional: una nueva alfabetización digital [Computational thinking: A new digital literacy]. *RED-Revista de Educación a Distancia*, *46* (4). https://doi.org/10.6018/red/46/4

Zulnaidi, H., Oktavika, E., & Hidayat, R. (2020). Effect of use of GeoGebra on achievement of high school mathematics students. *Education and Information Technologies*, *25*, 51-72.

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Validation of a scale for measuring the adaptation of Peruvian university teachers to virtual academic settings

Validación de una escala para medir la adaptación de docentes universitarios peruanos a los medios académicos virtuales

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Abstract:

University teachers have had to adapt to the changes required by virtual education. The aim of this study is to adapt and validate the scale of adaptation to virtual academic media in Peruvian university teachers. The participants were 252 university teachers selected using purposive non-probability sampling. The instrument being adapted was the student adaptation to college questionnaire of Rodriguez-Ayan and Sotelo (2014), which consists of eleven items distributed across three dimensions. The content validity was studied by means of the judgement of twelve experts. We carried out exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) and estimated the reliability using Cronbach's alpha. Before calculating the Kaiser-Meyer-Olkin coefficient (0.916) and performing Bartlett's test of sphericity ($\chi^2 = 2571.3$, $p < 0.001$), we performed EFA. As a result, we found an underlying three-factor model, which was corroborated by CFA with satisfactory goodness of fit indexes ($\chi^2 = 107.55$, $df = 37$, $\chi^2/df = 2.907$; $p = 0.000$; RMR = 0.034; GFI = 0.943; AGFI = 0.899; CFI = 0.972; TLI = 0.959; NFI = 0.959; IFI = 0.973, and RMSEA = 0.077), and acceptable reliability (alpha = 0.897). The scale of adaptation to virtual academic settings shows evidence of validity and reliability and can be applied to Peruvian university teachers.

Keywords: educational system, evaluation, validation, online learning, information technology, teaching, higher education, university teacher, Peru, questionnaire, test reliability, test validity.

Resumen:

Los docentes universitarios han tenido que adaptarse a los cambios que demanda la educación virtual. El objetivo de este estudio es adaptar y validar la escala de adaptación a los medios académicos virtuales en docentes universitarios peruanos. Los participantes fueron 252 docentes universitarios seleccionados con base en un muestreo no probabilístico intencional. El instrumento objeto de adaptación fue el cuestionario de adaptabilidad a la vida universitaria de Rodriguez-Ayan y Sotelo (2014), el cual consta de once ítems distribuidos en tres dimensiones. La validez de contenido se estudió por medio del juicio de doce expertos. Se realizó un análisis factorial exploratorio (AFE) y un análisis factorial confirmatorio (AFC), y se estimó la fiabilidad a través del coeficiente alfa de Cronbach. Previo al análisis del coeficiente Kaiser-Meyer-Olkin (0.916) y a la prueba de esfericidad de Barlett ($\chi^2 = 2571.3$, $p < 0{,}001$), se efectuó el AFE. El resultado fue un modelo de tres factores, que fue corroborado por el AFC con índices de bondad de ajuste satisfactorios ($\chi^2 = 107.55$, $df = 37$, $\chi^2/df = 2.907$; $p = 0.000$; RMR = 0.034; GFI = 0.943; AGFI = 0.899; CFI = 0.972; TLI = 0.959; NFI = 0.959; IFI = 0.973 y RMSEA = 0.077) y una confiabilidad aceptable (alfa = 0.897). La escala de adaptación a los medios académicos virtuales da muestras de validez y confiabilidad, y puede ser aplicada en docentes universitarios peruanos.

Palabras clave: sistema educativo, evaluación, validación, aprendizaje en línea, tecnología de información, enseñanza, enseñanza superior, profesor de universidad, Perú, cuestionario, fiabilidad del test, validez del test.

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1. Introduction

The current social environment has undergone significant changes owing to the rapid advance of technology and its spread into different areas. It is now common for information and communication technologies (ICT) to be integrated into people's daily routines (Aguilar y Otuyemi, 2020). The changes caused by the digital era have had a significant impact on ways of working and communication, with a move from paper-based records to software that facilitates much more effective data management. This context has led university teachers to reflect on the integration of digital technology in their classes (Rivera et al., 2021). Preparing for a virtual class requires more than having knowledge of a specific field and the desire to communicate effectively. It is essential to have basic teacher training in ICT, that includes the ability to manage virtual classrooms, as well as presenting information in an instructive and interesting way (Juanes et al., 2020).

The growth of online social networks has created new working contexts, making exploration of their use within the university community attractive and important, especially between students and teachers. This idea has arisen when observing the growth of these platforms and discussions on the topic (Arceo et al., 2021). The change from in-person classes to online ones has put considerable pressure on teachers, both in doing their jobs and in the need to adapt to this new situation (Tejedor et al., 2021). These technologies have brought about the creation of innovative educational focuses that are adapted to students' needs, giving rise to a varied offer of online training, ranging from short courses to diplomas and other postgraduate qualifications (Navarro et al., 2021).

Increasing digitisation requires educators to be trained in how to integrate these tools flexibly into the teaching process, especially in higher education, where command of technological and digital competences is essential to promote the development of skills that allow students to use these tools (Cruz et al., 2022). For the integration of technologies in universities to be a success, teachers must adapt to changes in their teaching methods and improve their pedagogical competences (García, 2023). In this context, teachers currently find themselves facing new challenges, as they have had to acquire technological skills that are now fundamental in teaching, unlike with technology's earlier role as a supporting tool (Cardona, 2021). In this sense, educators as a group have undergone significant changes and have had to transform their pedagogical focuses to adapt to online teaching, with the aim of maintaining their functionality and preserving their livelihoods (Vicentini, 2020).

In this digital setting, teachers at various levels of education have abruptly had to reinvent their educational focuses, finding themselves obliged to adopt new working tools that go beyond the field of paper, tests, and other formative methods (Arriagada, 2020) with the aim of reacting to the new demands, which combine with the previously known ones in the context of online teaching (Murillo, 2020). The need to plan and prepare lessons, review materials, adapt content and manage the design, delivery, receipt and feedback on students' individual activities are some of the challenges they have had to meet (Ruiz, 2020).

Adaptability is people's ability to handle constant changes in their working environment, responding proactively to the demands of their role at work (Arias, 2021). In this instance, adaptability enables greater synchronisation of workers with their duties as they conform to the needs of the employer and the demands of their position (Arnau, 2011). People's capability for adaptation is reflected in their capacity to respond positively to changing situations, and is defined as the ability to learn and adjust to fluctuations in surroundings (Garzón, 2018). Adaptability is regarded as a type of psychological focus, a personality trait that involves flexibility and willingness to change (Fraga, 2014). Teachers and universities had to confront an unusual situation when adopting a hybrid educational focus to keep providing lectures throughout the academic year (De Obesso et al., 2023). In this situation, students and their families, like the teachers, had to adapt to the requirements, tools, and essential elements to continue learning from their homes (Portillo et al., 2020).

When referring to adaptation in the field of ICT, it is essential to understand that this involves changes. It entails defining which areas will be affected and the situations that will require changes, such as reorganising routines, changes to working timetables and patterns, and changes to the management and dissemination of information; all of this through new patterns relating to ICT (Arias, 2021). In relation to this, researchers note that teachers' capacity to adapt has transcended the educational sphere, as

the online workload, the urgent need for training, technological challenges (access and handling), and communicating with an audience through a camera, among other experiences, have led to psychological exhaustion that has affected the mental health of the population in general, and of teachers in particular (Reynosa et al., 2020).

With regards to measuring adaptability, the literature includes numerous studies that have examined the psychometric properties of documented evaluation instruments. For example, in Spain (Arnau, 2011), indicators of analysis of internal validity have been presented. They show the presence of three factors explaining 56.58% of variability, which coincide with the theoretically proposed dimensions of attitudes (cognitive, behavioural, and emotional) that should be considered if we intend to improve the predisposition towards action. A study in Argentina (Rodriguez-Ayan & Sotelo, 2014) on the adaptation of students in Uruguay to university life included a questionnaire and analysed its psychometric characteristics. The results showed that the academic and social dimensions were positively associated with academic performance, while there was no correlation between social adaptation and emotional exhaustion. On the other hand, a negative impact was observed in institutional adaptation in performance. In Peru, Arias (2021) research has been performed on adaptation to information and communication technologies (ICT) in the context of workplace procrastination in the public sector. The main results showed that workers in this sector displayed a low degree of adaptability to ICT, resulting in high workplace procrastination. This study showed a significant inverse relationship between the two variables.

Although there are tools for measuring adaptation, versions adapted to the current context and moment to evaluate adaptation to online classes have seemingly not yet been developed. In this context, and taking into account the evident deficiencies in Peru's higher education system, we believe it is crucial to investigate the psychometric properties of a scale designed to measure the adaptation of higher-education teachers to virtual academic settings.

Consequently, the aim of this study is to modify the adaptation to virtual academic media scale for university teachers in Peru, given the current importance and relevance of having an instrument of this type. The specific objectives are to validate the scale of adaptation to virtual academic media for university teachers in Peru and to examine the psychometric properties of a scale of adaptation in the context of virtual education.

2. Methodology

2.1. Type of study

This research is an instrumental, cross-sectional study; its aim is to validate a scale for measuring the adaptation of university teachers in Peru to virtual academic media (Montero & León, 2002).

2.2. Participants

Regarding the participants in the research, we used purposive non-probability sampling to select a total of 252 university teachers from three leading Peruvian higher-education institutions. Of this group, 31.50% were male, and 68.50%, female. The ages of these teachers ranged from 26 to 53 years, with a mean age of 34.26 years and a standard deviation of 8.97. With regards to their place of residence, 13.91% lived on Peru's coast, 58.39% in the mountains, and 27.70% in the jungle.

We should also note that the participants taught in a range of academic disciplines, distributed as follows: 39.08% in nursing, 27.72% in medicine, 17.20% in psychology, 9.69% in dentistry, 3.41% in biology, and 2.90% in nutrition.

2.3. Instrument

The research was carried out in the context of the Covid-19 pandemic, which necessitated the implementation of social isolation and quarantine measures in Peru. To collect the data, we designed a questionnaire using Google Forms and made it available for completion between 21 and 30 December 2021. This questionnaire was administered through social networks (Facebook and WhatsApp) and the academic platforms of the three participating universities. Teachers were asked to participate voluntarily, and they were given access to detailed information about the aims of the research, the commitment to respect their privacy, and the need for them to give informed consent. Only those who agreed to participate in the study and gave their consent answered the questionnaire.

The instrument that was adapted for this research was the "Teachers' Stressors in Times of Pandemic Scale", originally developed by Oros et al. (2020) for teachers in Argentina. This scale comprises 21 items distributed in five dimensions and uses a Likert-scale

that runs from "Not at all stressful" (1) to "Very stressful" (5). To evaluate its quality, we analysed its content validity, with the participation of twelve experts in the field of education. We also carried out an exploratory factor analysis to determine the construct validity, using the applicable KMO and Bartlett chi-squared sampling adequacy indexes. The scale also showed an acceptable internal consistency, with a coefficient omega (ω) of 0.92.

2.4. Process

We went on to collect the data and cleansed them carefully to identify missing data and outliers. We also recalibrated the scores for the inverse items. We did the study in various stages.

First, to evaluate comprehension of the items, we adapted it culturally through semi-structured interviews with twelve experts in higher education. We did this because, although the terms were the same in Spanish, their interpretation could differ owing to cultural differences. As a result of this process, we modified items 1, 2, 4, 6, 7, and 9 to 21, ensuring there were no linguistic biases (Van de Vijver & Hambleton, 1996).

Second, we submitted the adapted scale for assessment by twelve specialists in higher education, who evaluated the clarity, representativeness, and relevance of the items. They used a validation format that made it possible to calculate the Aiken's V coefficient to determine the validity based on the content (Ventura-León, 2019).

Finally, to collect data, we administered the questionnaire using Google Forms, with the link to it being active from 9 to 30 August 2021. We contacted the participants through social networks such as WhatsApp and teachers' institutional email addresses. The importance of informed consent was emphasised and we explained that participation was entirely voluntary.

2.5. Data analysis

The analysis was divided into three different phases. In the first phase, we carried out an exploratory factor analysis (EFA) to evaluate the model's adequacy, using Bartlett's chi-squared and the Kaiser-Meyer-Olkin (KMO) coefficient. Then, in the second phase, we performed a confirmatory factor analysis (CFA), in which we evaluated various measurements of fit, such as the comparative fit index (CFI), the Tucker-Lewis index (TLI), the goodness of fit index (GFI), and the adjusted goodness of fit index (AGFI). In the third phase, we determined the reliability of the construct using Cronbach's alpha, along with the respective confidence intervals. We used the SPSS Amos version 25 software for all of these analyses.

2.6. Ethical considerations

This research was approved by the ethics committee of the Universidad Peruana Unión with reference number: 2021-CE-EPG-000066.

3. Results

3.1. Cultural adaptation of the scale of adaptation to virtual academic media

Table 1 shows the adaptation of the items from the original version in time and context for the aims and objectives of the present research, situations during the Covid-19 pandemic.

TABLE 1. Adaptation of items from the scale of adaptation to virtual academic media.

Item	Original version	Adapted version
1	I have made new friends at university.	I have been able to contact my colleagues using the virtual platform provided by the university where I work.
2	I have met people I can study with at university.	Through the virtual academic platform, I have been able to make a group for study/research or other related activities.
3	I communicate well with my classmates.	Communication with my peers through the virtual academic platform is adequate.
4	I participate in the recreational activities organised in my faculty.	The virtual academic platform enables recreational activities.

5	In my free periods, I use the canteen, multi-function building, etc. to meet and speak with classmates.	In free periods, I can use the virtual academic platform to meet with students/colleagues.
6	I am aware of what research and university extension are.	The virtual academic platform has tools for research and university extension.
7	I am aware of what university autonomy and co-governance are.	The virtual academic platform gives me the possibility of interacting with my managers and/or the university's senior management.
8	I have the information I need about the student welfare service.	Through the virtual academic platform, I have access to digital libraries/databases.
9	I have the information I need about my modules (timetables, programmes, activities I must do, etc.).	The virtual academic platform has all of the information about my modules, timetables, academic events, and other things.
10	I am clear about what the essential concepts I should learn in my subjects are.	The virtual academic platform enables me to show clearly the objectives of the subjects I teach.
11	I am clear that the teachers of my modules expect that I will be able to complete or resolve problems.	I am clear that my immediate managers expect that I will be able to achieve learning through the virtual academic platform.

3.2. Content validity

All of the items received a favourable evaluation (Table 2). In this case, items 2, 6, and 9 were shown to be most relevant (V = 0.94, *CI 95%*: .80-0.99); items 2, 6, 9, and 11 were shown to be most representative (V = 0.94, *CI 95%*: .80-0.99); and items 1, 2, 8, 9, 11 were clearest (V = 0.94, *CI 95%*: .80-0.99).

We performed an exhaustive review of the format validity based on reviewing the responses and suggestions of the experts. With this information, we repeated the Aiken V analysis. This detailed revision has allowed us to improve the quality and coherence of the study (Table 2).

3.3. Exploratory factor analysis

The result of the Kaiser-Meyer-Olkin measure was 0.916, while Bartlett's test of sphericity had the following values: χ^2 = 2571.3, p <0.001. Consequently, we could reject the null hypothesis that there was no correlation between the variables. Furthermore, the

TABLE 2. Aiken's V for the evaluation of the relevance, representativeness, and clarity of the items on the scale.

Item	Relevance (n = 12)				Representativeness (n = 12)				Clarity (n = 12)			
	M	*SD*	*V*	*CI 95%*	*M*	*SD*	*V*	*CI 95%*	*M*	*SD*	*V*	*CI 95%*
1	2.67	0.49	0.89	0.73-0.96	2.75	0.45	0.92	0.76-0.97	2.83	0.39	0.94	0.80-0.99
2	2.83	0.39	0.94	0.80-0.99	2.83	0.39	0.94	0.80-0.99	2.83	0.39	0.94	0.80-0.99
3	2.75	0.45	0.92	0.76-0.97	2.75	0.45	0.92	0.76-0.97	2.75	0.45	0.92	0.76-0.97
4	2.67	0.49	0.89	0.73-0.96	2.67	0.49	0.89	0.73-0.96	2.75	0.45	0.92	0.76-0.97
5	2.58	0.67	0.86	0.70-0.94	2.75	0.45	0.92	0.76-0.97	2.75	0.45	0.92	0.76-0.97
6	2.83	0.39	0.94	0.80-0.99	2.83	0.39	0.94	0.80-0.99	2.83	0.39	0.94	0.80-0.99
7	2.75	0.45	0.92	0.76-0.97	2.75	0.45	0.92	0.76-0.97	2.75	0.45	0.92	0.76-0.97
8	2.67	0.65	0.89	0.73-0.96	2.67	0.65	0.89	0.73-0.96	2.83	0.39	0.94	0.80-0.99
9	2.83	0.39	0.94	0.80-0.99	2.83	0.39	0.94	0.80-0.99	2.83	0.39	0.94	0.80-0.99
10	2.75	0.45	0.92	0.76-0.97	2.75	0.45	0.92	0.76-0.97	2.75	0.45	0.92	0.76-0.97
11	2.75	0.45	0.92	0.76-0.97	2.83	0.39	0.94	0.80-0.99	2.83	0.39	0.94	0.80-0.99

Note: M = mean, SD = standard deviation, V = Aiken's V coefficient, *CI 95%* = confidence interval of Aiken's V.

levels obtained with both instruments confirmed that performing an EFA with the sample was appropriate (Quiroz Campas et al., 2021). We did this taking into account a principal components extraction method and Varimax rotation. As a result, we found that items were in three underlying factors: the first with 5 items, the second with 3 items, and the third with 3 items (Table 3). In this case, the accumulated variance was 77.65%, which indicates that little information is lost when obtaining three factors.

TABLE 3. Results of the exploratory factor analysis (EFA).

Indicator	Factor		
	1	2	3
AD2	.819		
AD1	.817		
AD3	.693		
AD5	.619		
AD4	.488		
AD8		.841	
AD7		.821	
AD6		.710	
AD11			.867
AD10			.836
AD9			.789

Note: extraction method: principal component analysis.

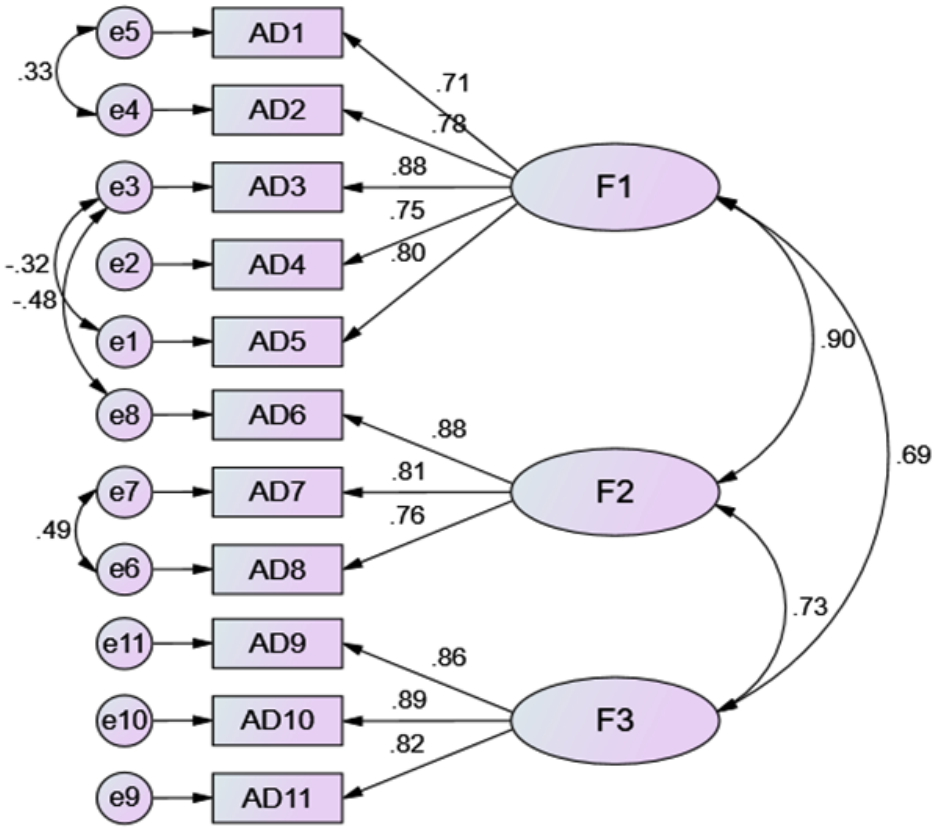
3.4. Confirmatory factor analysis (CFA)

A CFA was then carried out based on the eleven indicators and the three factors or latent variables. As can be noted, all the goodness of fit indexes complied with the criteria of the case (Table 4) and confirmed the three-factor model (Figure 1): $\chi^2 = 107.55$, $df = 37$, $\chi^2/df = 2.907$; $p = 0.000$; RMR = 0.034; GFI = 0.943; AGFI = 0.899; CFI = 0.972; TLI = 0.959; NFI = 0.959; IFI = 0.973, and RMSEA = 0.077. Therefore, the scale is valid, and the model, adequate.

TABLE 4. Goodness of fit indexes.

Goodness of fit index	Value	Goodness of fit index	Value
RMR	0.034	TLI	0.959
GFI	0.943	NFI	0.959
AGFI	0.899	IFI	0.973
CFI	0.972	RMSEA	0.077

FIGURE 1. Internal structure of the scale of adaptation to virtual academic media.



3.5. Reliability

We calculated the internal consistency using Cronbach's alpha, obtaining a figure of 0.89 (*CI 95%* = 0.85-0.90), which indicated that the instrument is highly reliable.

4. Discussion

Peru, like all countries, had to confront the crisis caused by the Covid-19 pandemic unexpectedly and suddenly (Figallo et al., 2020). with education having to be provided through virtual platforms, thus necessitating the adaptation of teachers and students. In view of this, the aim of this research was to adapt and validate a scale of adaptation to virtual academic media of university teachers in Peru. Consequently, we conclude that this scale is applicable not only to research in the context of Peru, but also to contexts that include university teachers.

Analysis of the EFA and CFA shows that the model displays an adequate fit to the scale. The existence of three factors was also established, relating to the social, institutional, and academic sphere. This finding is similar to those from other research (Arnau, 2011; Riquelme-Plaza et al., 2022), which show that the instrument is valid and reliable to evaluate maintenance, problems, information management, and recent changes in teaching and learning processes. Besides, it helps to measure students' acceptance of online learning, similar to the study of Segura-Robles et al. (2022). In this way, it is possible to assume that this measurement can be used in new studies in Peru (Gassen et al., 2020; Surkan et al., 2021), as the results corroborate satisfactory psychometric and validity properties of the scale. Nonetheless, some authors consider this instrument to be multidimensional, with four factors: academic, institutional, social, and personal-emotional adaptation (Domínguez-Lara, 2017). For them, transition to university life is closely linked to the physical and mental well-being of teachers and students in the university (Chacaltana-Hernández, 2022).

The results presented here underline the profound importance of the capacity to adapt to the challenges presented by virtual university platforms in the midst of stressful situations, given that the effect of stress (strongly marked in women) is lost when the level of adaptability before the event is high. Consequently, the motive of study scale provides a favourable empirical result for adaptation to virtual classes and university

teachers' predisposition towards adaptation to future professional changes. In turn, it is configured as a valid instrument to prepare an intervention aimed in an integrated way at future research works.

The importance of these results revolves around their utility in the context of the pandemic, for the effect and challenge that technological innovation has entailed for university teachers (as they have had to use virtual platforms) has been a cause for concern in the global and local university community. In combination with this, other authors (Reynosa et al., 2020) maintain that the magnitude of the spread of Covid-19 disrupted the global educational dynamic, imposing a break with everyday life and meaning that prevention, self-care, and access to technology were accepted as the most viable way to preserve human life without giving up on education. So, the process of teacher adaptation in the context of Covid-19 has driven the need for teacher training in the use of ICT.

In view of these findings, it is important to develop teachers' command of ICT in future through continuous professional development, including after the pandemic (González, 2021). It is also necessary to note that students must be introduced to the use of digital tools before these are implemented in the educational process, as these new technologies have brought about a change in education, both in the way in which the teaching-learning process takes place and in the scenarios in which it occurs. (Hernández et al., 2018). In the case of teachers, there is little evidence of autodidacticism in the use of virtual tools to combine the methodological strategies and making the educational process dynamic.

This work's limitations include the use of purposive non-probability sampling. Also, as the sample was not random, the results cannot be generalised beyond the context from which they were extracted. Future studies could use probability sampling to make the findings generalisable. Secondly, the scale was not applied to a broader sample of public and private universities in the country to compare the viability of adaptation.

We conclude that the scale of adaptation to virtual academic media in university teachers in Peru demonstrates adequate psychometric properties and can be used for research in Peruvian settings.

5. Conclusions

In conclusion, this validation of a scale for measuring the adaptation of university teachers in Peru to virtual academic settings, backed by solid psychometric properties, confirms its reliability and validity, and underlines its applicability to the context of Peru. The purpose of this adaptation is to provide a valid and reliable instrument that makes it possible to obtain the opinions of university teachers in Peru about virtual academic media. Consequently, it represents a contribution to scientific literature as instruments that measure this variable had not previously been found. This tool not only strengthens current research, but is also a valuable resource for future research. Accordingly, we hope that this scale will contribute to a deeper comprehension of the adaptation of teachers to virtual education in Peru.

In view of the previous analysis, it is important to note the emergence of future lines of research directed at the study of online learning, distance learning strategies, online distance learning platforms, and strategies for emotional support for teachers, among others. It is also expected that this research will promote continuous improvement in this educational field, thus supporting the continuous development and improvement of online teaching. As university teachers in Peru adopt more effective strategies and adapt to the changing demands of virtual education, it is hoped that a learning environment in constant evolution that benefits teachers and students alike will be fostered. This research lays the foundations for future developments and refinements in online pedagogy, which will boost the quality of higher education in Peru and in other parts of the world that currently face similar challenges.

References

Aguilar, L. R. I., & Otuyemi, E. O. (2020). Análisis documental: importancia de los entornos virtuales en los procesos educativos en el nivel superior [Documentary analysis: Importance ofvirtual environments in educational processesat the higher level]. *Revista Tecnología, Ciencia y Educación*, (17), 57-77. https://doi.org/10.51302/tce.2020.485

Arceo, E. P., Estrella, H. A., & Esquivel, A. S. (2021). Redes sociales virtuales en la vida universitaria de estudiantes y profesores [Virtual social networks in the university life of students and professors]. *Revista Electrónica Sobre Ciencia , Tecnología y Sociedad*, *8* (15), 1-21. https://www.ctes.org.mx/index.php/ctes/article/view/733

Arias, J. L. (2021). Adaptabilidad a las tecnologías de la información, comunicación y procrastinación laboral en colaboradores del sector público en Arequipa [Adaptability to information and communication technologies and procrastination in public sector employees in Arequipa]. *Revista Científica UISRAEL*, *8* (1), 77-89. https://doi.org/10.35290/rcui.v8n1.2021.348

Arnau, L. (2011). Cuestionario para evaluar la adaptabilidad de los adultos desempleados hacia los cambios profesionales: aplicación preliminar y características psicométricas [A questionnaire for evaluating unemployed adults' ability to adapt to professional changes: Preliminary implementation and psychometric properties]. *Revista Electronica de Investigacion Educativa*, *13* (2), 99-112. https://redie.uabc.mx/redie/article/view/286

Arriagada, P. (2020). Pandemia Covid-19: educación a distancia. O las distancias en la educación [Pandemic Covid-19: Distance education. Or distances in education]. *Revista Internacional de Educación Para La Justicia Social*, *9* (3). https://revistas.uam.es/riejs/article/view/12396

Cardona, L. M. (2021). Percepciones de docentes frente al cambio en tiempos de pandemia [Teachers' perceptions about change in times of pandemic]. *Educación y Ciencia*, (25), e12515. https://doi.org/10.19053/0120-7105.eyc.2021.25.e12515

Chacaltana-Hernández, K. M., Bontempo, E. M., y Varela, S. G. (2022). Miedo al coronavirus y depresión en estudiantes de psicología de Ica [Fear of the coronavirus and depression in psychology students in Ica]. *PsiqueMag / Revista Científica Digital de Psicología*, *11* (2), 42-49. https://doi.org/10.18050/psiquemag.v11i2.2109

Cruz, J. L., Llantoy, B. E., Guevara, M. J., Rivera, A. W., & Minchola, A. M. (2022). Competencias digitales de docentes en la educación superior universitaria: retos y perspectivas en el ámbito de la educación virtual [Digital competences of teachers in university higher education: Challenges and perspectives in the field of virtual education]. *Ciencia Latina Revista Científica Multidisciplinar*, *6*(1), 1536-1567. https://doi.org/10.37811/cl_rcm.v6i1.1598

De Obesso, M. M., Núñez-Canal, M., & Pérez-Rivero, C. A. (2023). How do students perceive educators' digital competence in higher education? *Technological Forecasting and Social Change*, (188), 122284. https://doi.org/10.1016/j.techfore.2022.122284

Dominguez-Lara, S. (2017). Construcción de una escala de autoeficacia para la investigación: primeras evidencias de validez [Development of a research self-efficacy scale: Preliminary evidence of validity]. *Revista Digital de Investigación En Docencia Universitaria*, *11* (2), 308-322. https://doi.org/10.19083/ridu.11.514

Figallo *et al*.. (2020). Perú: educación superior en el contexto de la pandemia por el Covid-19 [Peru: Higher education in the context of the Covid-19 pandemic]. *Revista de Educación Superior En América Latina*, (8), 20-28. https://doi.org/10.14482/esal.8.378.85

Fraga, S. (2014). La adaptabilidad organizacional: un aporte conceptual para las organizaciones contemporáneas [Organizational adaptability: A conceptual contribution for today's organizations]. *REOP - Revista Española de Orientación y Psicopedagogía*, *25* (1), 128-136. https://doi.org/10.5944/reop.vol.25.num.1.2014.12017

García, O. V. (2023). Uso y percepción del chatGPT en la educación superior [Usage and perception of ChatGPT in higher education]. *Revista RITI*, *11* (23), 1-10. https://doi.org/10.36825/RITI.11.23.009

Garzón, M. A. (2018). Capacidad dinámica de adaptación [Dynamic capacity of adaptation]. *Visión del Futuro*, *15*(22), 114-134. https://visiondefuturo.fce.unam.edu.ar/index.php/visiondefuturo/article/view/280

Gassen *et al*.. (2020). Adaptation and validation of the new general self-efficacy scale. *Avaliacao Psicologica*, *19* (4), 409-419. https://doi.org/10.15689/ap.2020.1904.16654.07

González, M. O. (2021). La capacitación docente para una educación remota de emergencia por la pandemia de la COVID-19 [Teacher training for an emergency remoteeducation during the COVID-19 pandemic]. *Revista Tecnología, Ciencia y Educación*, (19), 81-102. https://doi.org/10.51302/tce.2021.614

Hernández, R. M., Orrego, R., & Quiñones, S. (2018). Nuevas formas de aprender: la formación docente frente al uso de las TIC [New ways of learning: Teacher training in the use of ICTs]. *Propósitos y Representaciones*, *6* (2), 671-685. https://doi.org/10.20511/pyr2018.v6n2.248

Juanes, B. Y., Munévar, O. R., & Cándelo Blandón, H. (2020). Virtuality in education. Key aspects for the continuity of teaching in times of pandemic. *Revista Pedagógica de La Universidad de Cienfuegos*, *16* (76), 1-5. https://conrado.ucf.edu.cu/index.php/conrado/article/view/1510

Murillo, J. (Dir.). (2020). *Revista Internacional de Educación para la Justicia Social*, *9* (3), 1-451. https://doi.org/10.15366/riejs2020.9.3

Navarro, R., López, R., & Caycho, G. (2021). Retos de los docentes universitarios para el diseño de experiencias virtuales educativas [Challenges for university teachers in the design of virtual educational experiences during the pandemic]. *Desde el Sur*, *13* (2), e0017. https://doi.org/10.21142/des-1302-2021-0017

Oros, L., Vargas, N., & Chemisquy, S. (2020). Estresores docentes en tiempos de pandemia: un instrumento para su exploración [Teachers' stressors in times of pandemic: An instrument for their exploration]. *Revista Interamericana de Psicología/Interamerican Journal of Psychology*, *54* (3), e1421. https://doi.org/10.30849/ripijp.v54i3.1421

Portillo, S. A., Castellanos, L. I., Reynoso, Ó. U., & Gavotto, O. I. (2020). Enseñanza remota de emergencia ante la pandemia Covid-19 en educación media superior y educación superior [Emergency remote teaching in the face of the Covid-19 pandemic in middle and higher education]. *Propósitos y Representaciones*, *8* (3), 1-17. http://dx.doi.org/10.20511/pyr2020.v8nSPE3.589

Quiroz, C. Y., Molina, I. G., Espinoza, F., García, C., Murillo., C. A., & Acosta, E. I. (2021). Diseño y validación de un instrumento para medir la calidad de vida laboral en trabajadores de instituciones de educación superior del sur de Sonora, México [Design and validation of an instrument to measure the quality of working life in workers of higher education institutions in southern Sonora, Mexico]. *Interciencia*, *46* (11), 423-430. https://www.redalyc.org/articulo.oa?id=33969826004

Reynosa, E., Rivera, E. G., Rodríguez, D. B., & Bravo, R. E. (2020). Adaptación docente educativa en el contexto Covid-19: una revisión sistemática [Adapting educational teachers in the Covid-19 context: A systematic review]. *Revista Conrado*, *16* (77), 141-149. https://conrado.ucf.edu.cu/index.php/conrado/article/view/1580

Riquelme-Plaza, I., Cabero-Almenara, J., y Marín-Díaz, V. (2022). Validación del cuestionario der competencia digital docente en profesorado universitario chileno [Validation of the digital teaching competence questionnaire in Chilean university teachers]. *Revista Electronica Educare*, *26* (1), 1-15. https://doi.org/10.15359/ree.26-1.9

Rivera, P., Sánchez, E., & Cortés, B. (2021). La disrupción de lo presencial a lo virtual. Percepciones de los directores de docencia sobre el uso de plataformas digitales en contexto de pandemia en una universidad del norte de Chile [The disruption of the face-to-face to the virtual. Perceptions of teaching directors on the use of digital platforms in the context of a pandemic at a university in northern Chile]. *Páginas de Educación*, *14* (2), 77-95. https://doi.org/10.22235/pe.v14i2.2607

Rodriguez-Ayan, M. N., & Sotelo, M. E. (2014). Cuestionario de adaptación a la vida universitaria (CAVU): desarrollo, estructura factorial y validación inicial [Student adaptation to college questionnaire (CAVU): development, factor structure and initial validation]. *Revista Argentina de Ciencias del Comportamiento*, *6* (3), 40-49. https://revistas.unc.edu.ar/index.php/racc/article/view/7951

Ruiz, G. (2020). Marcas de la pandemia: el derecho a la educación afectado [The pandemic traces: The stricken right to education]. *Revista Internacional de Educación para la Justicia Social*, *9* (3), 45-59. https://doi.org/10.15366/riejs2020.9.3.003

Segura-Robles, A., Parra-González, M. E., & Leiva-Olivencia, J. J. (2022). Traducción, adaptación y validación de la escala medida de aceptación del aprendizaje en línea (MAAEL) [Translation, adaptation, and validation of the e-learning acceptance measure (ELAM)]. *Formación Universitaria*, *15* (4), 1-8. https://doi.org/10.4067/s0718-50062022000400001

Surkan, P. J., Garrison-Desany, H. M., Rimal, D., Luitel, N. P., Kim, Y., Prigerson, H. G., Shrestha, S., Tol, W., & Murray, S. M. (2021). Adaptation and psychometric validation of the Prolonged Grief Disorder scale among widows in central Nepal. *Journal of affective disorders*, *281*, 397-405. https://doi.org/10.1016/j.jad.2020.12.018

Tejedor, S., Cervi, L., Tusa, F., & Parola, A. (2021). Los docentes universitarios frente al cambio a la educación virtual impuesta por el coronavirus [University teachers face the change to virtual education imposed by the coronavirus]. *Sociedade e Estado*, *36* (3), 915-943. https://doi.org/10.1590/S0102-69922021360300004

Van de Vijver, F., y Hambleton, R. K. (1996). Translating tests: Some practical guidelines. *European Psychologist*, *1* (2), 89-99. https://doi.org/10.1027/1016-9040.1.2.89

Ventura-León, J. (2019). De regreso a la validez basada en el contenido [Back to content-based validity]. *Adicciones*, *20* (10), 1-4. https://doi.org/10.20882/adicciones.1213

Vicentini, I. (2020). *La educación superior en tiempos de Covid-19 [Higher education in times of Covid-19]*. Banco Interamericano de Desarrollo. http://dx.doi.org/10.18235/0002481

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Validation of the emotional development questionnaire for secondary school students (CDE-SEC)

Validación del cuestionario de desarrollo emocional para educación secundaria (CDE-SEC)

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Abstract:

The importance of supporting students' emotional development is increasingly apparent in education, especially in secondary education. In this stage, adolescents experience a variety of changes and needs that require training and emotional support. However, in order to be able to implement effective educational programmes that promote emotional development, it is essential to know the level of emotional competence of students, and assessment instruments that can appropriately evaluate this competence are needed for this purpose. This paper presents the validation of the emotional development questionnaire for secondary school students (CDE-SEC). A sample of 1296 students from years one to four of compulsory secondary education from different schools in Spain was used, although partial samples were used for specific analyses. Several studies were carried out to demonstrate the internal consistency and validity of the instrument: calculation of the reliability coefficient, confirmatory factor analysis, and the correlation of the CDE-SEC with recognised measures of emotional intelligence, personality, adjustment difficulties, social behaviour, and self-esteem. In addition, a regression study was used to calculate the incremental validity. The results indicate that the CDE-SEC is a theoretically well-founded questionnaire with good psychometric characteristics. In short, it is considered to be an optimal tool for assessing the emotional competence of secondary school students and evaluating the effectiveness of educational programmes to promote personal, emotional, and social development.

Keywords: emotional competence, questionnaire, validity, factor analysis, secondary education.

Resumen:

La importancia de atender al desarrollo emocional del alumnado está cada vez más presente en el ámbito educativo y, especialmente en la educación secundaria. En esta etapa los adolescentes experimentan diversidad de cambios y necesidades que requieren de formación y acompañamiento emocional. Sin embargo, para poder aplicar programas educativos eficaces que promuevan el desarrollo emocional es imprescindible conocer el nivel de competencia emocional de los estudiantes y para ello se necesitan instrumentos de evaluación que puedan valorar apropiadamente esta competencia. En este trabajo presentamos la validación del Cuestionario de Desarrollo Emocional para estudiantes de Secundaria (CDE-SEC). Se ha contado con una muestra de 1296 estudiantes de primero a cuarto de la Educación Secundaria Obligatoria de diferentes centros educativos de España, aunque se han utilizado muestras parciales para análisis específicos. Se han realizado diversos estudios para demostrar la consistencia interna y la validez del instrumento: el cálculo del coeficiente de fiabilidad, un análisis factorial confirmatorio y la correlación del CDE-SEC con medidas reconocidas de inteligencia emocional, personalidad, dificultades de ajuste, comportamiento social y autoestima. Asimismo, se ha estudiado la validez incremental mediante un estudio de regresión. Los resultados indican que el

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CDE-SEC es un cuestionario bien fundamentado teóricamente y con buenas características psicométricas. En definitiva, se considera una herramienta óptima para evaluar la competencia emocional de los estudiantes de educación secundaria y para evaluar la eficacia en la promoción del desarrollo personal, emocional y social de programas educativos dirigidos a tal fin.

Palabras clave: competencia emocional, cuestionario, validez, análisis factorial, secundaria.

1. Introduction

Secondary education is a key formative stage for adolescents. During this stage, it is necessary to foster academic and professional development, as well as addressing personal, emotional, and social development (Álvarez-Justel & Álvarez-González, 2022; Pérez-Escoda & Filella, 2019).

Habits and behaviours are acquired during adolescence that shape the course of their life through transitions and behavioural patterns that affect well-being and development (Montes-Solís, 2023). Similarly, young people undergo numerous changes associated with maturational progress, identity building, and academic transitions. They experience changes that are physiological, cognitive, affective-emotional, social, etc. in nature and which require educational support that responds to their emotional and formative needs.

So, emotional education is presented as a key and indispensable element in the integral development of students (Eusebio, 2021) and as a resource to face the challenges of a changing society (Mestres, 2022; Pérez-Escoda & Filella, 2019). Emotional education proposes the development of emotional competences, understood as a collection of knowledge, capacities, skills, and attitudes necessary to understand, express, and regulate appropriately emotional phenomena (Bisquerra & Pérez-Escoda, 2007; Pérez-Escoda & Filella, 2019).

Based on scientific evidence, intervention to improve emotional competences is valuable and useful for adequate social adjustment of students (Cejudo, 2015; Peña-Casares & Aguaded-Ramírez, 2019). Furthermore, developing these competences favours problem solving, learning processes, and interpersonal relationships; it improves prosocial behaviour, as well as student well-being and the school environment (Midgett et al., 2017); and it reduces disruptive behaviour (Álvarez-Justel, 2021; Amutio et al., 2020). Besides, it has a preventive nature that minimises vulnerability, fosters positive tendencies and has a beneficial impact on health and on improving coping strategies (Gómez-Baya et al., 2017; Ros et al., 2018). It is also an important aspect of responsible citizenship (Pérez-Escoda & López-Cassà, 2022).

In this sense, the current educational legislation in Spain (the LOMLOE, the Organic Education Act 3/2020 Amending the Education Act 2/2006) considers emotional competences to be key to a full and comprehensive education. In secondary education, tutorial action and guidance are fundamental aspects of the formative process and of the integral development of the students (Álvarez-Justel & Álvarez-González, 2022; Ferrer-Esteban, 2023). So, according to Álvarez-González (2017), when speaking of an integral education, it is also necessary to propose tutoring and guidance based on the integrated model of tutoring and guidance, which includes, among its objectives, promoting personal and social development (self-knowledge and knowledge of others, autonomy, self-esteem, emotional awareness and regulation, social competence, life competences, etc.). Objectives that coincide with the development of emotional competences.

There has recently been a significant increase in programmes focussing on the development of emotional competences and, therefore, based on emotional education (Sánchez et al., 2018). Álvarez-Justel and Álvarez-González (2015) and Ferrer-Esteban (2023) provide a list of educational programmes that develop different emotional competences in secondary education.

Numerous experiences of the implementation of this type of programmes in secondary education have proven to be effective for students, with significant results for improving educational quality and human development (Rodríguez-Ledo et al., 2018). In the meta-analysis of the impact of programmes for young people, Durlak et al. (2010) discover significant improvements in adaptive

attitudes, positive social behaviour, reduction of behavioural problems, reduced emotional distress and better academic performance; they even contribute to suicide prevention. These programmes algo help to mitigate impact of circumstances that are common in adolescence, such as behavioural and relational problems, bullying, addictive substance use, antisocial behaviour patterns, and decreasing self-esteem (Keefer et al., 2018). Consequently, experts agree on the need to implement educational programmes that develop emotional competences to favour students' health and well-being, their integral development, and their social adjustment.

As has been shown, emotional competences are part of education and human development, especially for adolescents. Designing and implementing effective interventions involves knowing their recipients' starting level of emotional development. A rigorous bibliographic review identified a lack of instruments for these ages; in particular, a lack of instruments with a solid theoretical foundation. Therefore, we proposed creating and validating the emotional development questionnaire for secondary school students (CDE-SEC). The aim was to make available a useful and valid tool that permit the detection of young people's emotional needs and enable the design and/or adaptation of educational interventions in the different years of secondary education. It is a matter of providing an instrument that offers valuable information that makes it possible to guide decisions regarding the most appropriate content and strategies for interventions in the field of education.

1.1. The CDE-SEC instrument

The proposed emotional development questionnaire is based on the pentagonal emotional education model, which defines emotional competence as the set of knowledges, capacities, skills, and attitudes necessary to be aware of, comprehend, express, and appropriately regulate emotional phenomena (Bisquerra & Pérez-Escoda, 2007; Pérez-Escoda & Filella, 2019).

Preparation of this instrument started in 2008 with the creation of the CEE (emotional education questionnaire) (Álvarez, 2001). Since then, a rigorous evaluation process has been followed to offer a valid and reliable instrument that enables to know the level of emotional development of students in secondary education in accordance with the pentagonal model of emotional education (Bisquerra & Pérez-Escoda, 2007). To do so, we designed a new version with a large number of items that was subjected to expert validation. Various pilot studies were performed that made it possible to develop the initial statistical analyses to determine the technical properties of the instrument and adapt its wording to the respondents (Pérez-Escoda, 2016).

In this article, we present the study of the psychometric properties of the emotional development questionnaire for secondary school students (CDE-SEC). The instrument comprises thirty-three items answered on a Likert-type scale, with eleven answer options ranging from 0 ("Disagree fully") to 10 ("Agree fully"). After defining the structure of the scale, it was then computerised to enable online response.

2. Methodology

2.1. Procedures

The students answered the computer-based questionnaires in class with the teacher present. Student participation was voluntary and the schools had the informed consent of the students' families. Owing to limitations of time, availability of the instruments, and permission from the centres, the full set of questionnaires was not administered to all of the students. Consequently, partial samples were used for some of the analyses presented in this study. The size of the sample used for each analysis is shown in section 2.2.

2.2. Participants

To study the descriptive data, structure, composition, and reliability of the CDE-SEC, we used a sample of 1296 students from years one to four of compulsory secondary education (ESO) from different public, private, and state-funded private centres in Spain. The participants were aged between eleven and seventeen (M = 13.92, SD = 1.429). The distribution by age was as follows: 12 aged eleven, 262 aged twelve, 260 aged thirteen, 256 aged fourteen, 318 aged fifteen, 172 aged sixteen, and 16 aged seventeen. The distribution by school year was as follows: 346 from the first year, 302 from the second year, 253 from the third year, and 395 from the fourth year. 50.2% of the sample were female, and 49.8%, male.

All 1296 participants answered the CDE-SEC. However, only 297 of the them answered the Trait Emotional Intelligence Questionnaire (TEIQue) (Petrides, 2009). This questionnaire was adminis-

tered to study the convergent validity of the CDE-SEC. To observe the correlations of the scales from the questionnaire with the big-five personality traits (extroversion, agreeableness, openness, conscientiousness, and neuroticism), we examined a sample of 256 students who completed the Spanish version of the Big Five Questionnaire for children and adolescents (BFQ-NA).

We analysed the criterion validity of the CDE-SEC based on a sample of 629 students; specifically, we used the relationship between emotional competence and prosocial behaviour and adjustment difficulties according to the Strengths and Difficulties Questionnaire (SDQ). As a second verification of the criterion validity, a sample of 344 participants was used, who also completed the self-esteem scale of Rosenberg (Rosenberg, 1989). Finally, to investigate the incremental validity of the CDE-SEC, we examined a sample of 174 students who had answered the SDQ, BFQ-NA, and CDE-SEC questionnaires, and another of 164 students who fulfilled the self-esteem, BFQ-NA, and CDE-SEC questionnaires.

2.3. Ethical declaration

We followed the recommendations of the Bioethics Committee of the Universidad de Barcelona and the ethical norms established by the Helsinki Declaration of 1964, including all subsequent modifications.

The participating schools notified the families of the research. The parents or guardians of the students were asked to sign informed consent forms and return them to the administrators of the school. The research group signed a research agreement with each educational centre guaranteeing the confidentiality of the results.

2.4. Statistical analysis

For the study, a descriptive analysis of the emotional development questionnaire (CDE-SEC) was performed. We also carried out a factor analysis to identify the items with the highest loadings in the *emotional intelligence* factor. In addition, we analysed the reliability of the questionnaire, its convergent validity, the correlation with the personality dimensions, its criterion validity, and its incremental validity in relation to the big-five personality dimensions. We used IBM SPSS 27 for all the statistical analyses.

- Factor analysis: we forced one unrotated factor using principal components. Elements with loadings of less than .30 in this factor were eliminated.

- Reliability analysis: Cronbach's alpha was used to calculate the reliability of the scale.

- Convergent validity: as stated above, partial samples were used to test the convergent validity. We analysed the correlations between the CDE-SEC and another measure of emotional intelligence, the Trait Emotional Intelligence Questionnaire (TEIQue) and its four subscales.

- Correlations with the personality dimensions: the Pearson zero-order correlation between the CDE-SEC scale and the different personality dimensions measured by the BFQ-NA (Barbaranelli et al., 2003) was calculated.

- Criterion validity: to test the criterion validity of the CDE-SEC, three hierarchical regression analyses were performed. In the first, the dependent variable was the prosocial behaviour measurement with the fifth dimension of the SDQ questionnaire. In the second, the dependent variable was adjustment difficulties, again measured with the SDQ questionnaire. In the third, the dependent variable was self-esteem, measured with the RSES questionnaire. For the three analyses, age and gender were included in the first step and, subsequently, emotional competence.

- Incremental validity: to investigate the incremental validity of the CDE-SEC compared to other measurements whose capacity to predict prosocial behaviour and adjustment difficulties is already established, a hierarchical regression analysis was performed. In the first step, the demographic variables of age and gender were introduced into the regression equation. The second step included the five personality dimensions measured by the BFQ (Barbaranelli et al., 2003): neuroticism, openness, extroversion, conscientiousness, and agreeableness. Emotional competence was added in a third step.

2.5. Measurement instruments

- Emotional competence: the CDE-SEC instrument was used, and its validation is presented in the present study. This evaluates the level of emotional competence of secondary students aged between twelve and eighteen.

- Emotional intelligence: the Trait Emotional Intelligence Questionnaire - Adolescent Short Form (TEIQue-ASF) (Petrides et al., 2006) was applied. This is an adapted version of the short form for adults of the TEIQue developed by Petrides (2009). It was translated into Spanish and adapted by Ferrándiz et al. (2012). According to its authors, this questionnaire has an overall alpha coefficient of α = .83. It consists of thirty items with a seven-point Likert-type scale, ranging from 1 ("Very rarely") to 7 ("Very often"). This questionnaire is divided into four scales: emotionality, self-control, sociability, and well-being. It also provides an overall EI quotient considering all of the scales from the questionnaire. The test was applied to 259 of the participants. In this study, the reliability coefficient of Cronbach was α = .81.

- Personality: the adapted Spanish version of the BFQ-NA (Big Five Questionnaire - Children and Adolescents) (Barbaranelli et al., 2003), which is used to measure the big five personality model in adolescents, was administered. This model was first proposed by Fiske (1949) and then confirmed by McCrae and Costa (1987). It proposes that personality is structured around five central factors: extroversion, agreeableness, openness, conscientiousness, and neuroticism (McCrae & Costa, 1987). The Spanish version of the BFQ-NA was developed by Del Barrio et al., (2006). This instrument displayed adequate psychometric characteristics, with reliabilities (using Cronbach's alpha) of between .78 and .88; and test-retest coefficients between .62 and .84. Furthermore, the confirmatory and exploratory factor analyses displayed a structure with five factors corresponding to the big five (Soto et al., 2011). This test comprises sixty-five items to be answered on a five-point Likert-type scale, with values from one point ("Completely false for me") up to five points ("Completely true to me"). In our study, 259 participants completed this test. The Cronbach's alpha for the scale as a whole was α = .88, while the reliability of the subscales was as follows: conscientiousness α = .84; agreeableness α = .80; neuroticism α = .84; extroversion α = .81; openness α = .86.

- Adjustment difficulties and prosocial behaviour: we administered the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). This is a self-report instrument extensively used to evaluate different mental, emotional, and behavioural problems in children and adolescents. The SDQ comprises twenty-five items, distributed across five subscales (of five items each): emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behaviour. The first four subscales form a total *difficulties* score, while the fifth subscale provides a measure of *prosocial behaviour*. The test has a Likert answer format with three answer options: 1 ("Not true"), 2 ("Somewhat true") and 3 ("Certainly true"). In this study, we used the Spanish version developed by García et al. (2000), which is available online (http://www.sdqinfo.com). The test was administered to 436 of the study participants. The reliability coefficients of the subscales were very similar to those reported by Kersten et al. (2015): emotional symptoms α = .65; conduct problems α = .55; hyperactivity α = .66; peer problems α = .44; prosocial behaviour α = .59; total difficulties score α = .59.

- Self-esteem: the Rosenberg Self-Esteem Scale (RSES) was applied (Rosenberg, 1989). This is a short test with good psychometric properties. It evaluates self-esteem, understood as an overall evaluation of a person's positive or negative view of his or herself. In this study, we used the translation by Martín-Albo et al. (2007). The scale comprises ten items with a four-point Likert-type answer format, from strongly disagree to strongly agree. Five of the items provide positive self-esteem scores, while the other five items are coded inversely. This test was administered to 344 students from the sample. The Cronbach's alpha for the scale in our study was .71.

3. Results

3.1. Factor analysis of the CDE-SEC, descriptors and reliability

The result of the Kaiser–Meyer–Olkin test of sampling adequacy was .88 and Bartlett's test of sphericity was significant (p <.000), indicating that all of the variables were very suitable for factor analysis, and so we then performed a confirmatory factor analysis. We eliminated all items with factor loadings below .30. In total, we eliminated thirteen items, leaving a 33-item scale. The explained variance was 15.8% (See Table 1).

The values of the resulting scale with thirty-three elements ranged from a minimum of 1.22 to a maximum of 9.85, with a mean of 7. The standard deviation was 1.26. The complete CDE-SEC scale displayed

TABLE 1. Factor analysis of the CDE-SEC with one unrotated factor.

Component matrix							
Item 20	.705	Item 22	-.454	Item 30	.337	Item 38	-.240
Item 34	.684	Item 24	.453	Item 39	.333	Item 8	-.240
Item 27	-.620	Item 36	-.436	Item 32	-.331	Item 42	-.230
Item 45	.596	Item 46	.422	Item 37	.326	Item 14	-.223
Item 3	.575	Item 10	.392	Item 17	-.321	Item 31	-.197
Item 2	.572	Item 9	-.376	Item 11	.321	Item 4	-.197
Item 7	.560	Item 18	.370	Item 13	-.307	Item 44	-.174
Item 25	-.532	Item 12	.368	Item 29	-.304	Item 21	-.147
Item 6	.517	Item 43	.360	Item 16	.301	Item 40	.103
Item 15	.513	Item 26	-.359	Item 33	-.275	Item 41	-.022
Item 1	.479	Item 5	.356	Item 35	-.265		
Item 28	.455	Item 23	-.339	Item 19	-.262		

Note: $n = 1296$

a reliability measured using Cronbach's α of .87 and a McDonald's omega reliability coefficient of ω = .96.

3.2. Convergent validity

The correlation between the total emotional competence coefficient calculated for the CDE-SEC and the total coefficient of the TEIQue (Petrides, 2009) was $r = .68$. The correlations with the TEIQue subscales of well-being, self-control, emotionality, and sociability were .63, .53, .41, and .24 respectively ($p < .001$ for all of them).

3.3. Correlations with the personality dimensions

The correlations between the CDE-SEC and the five personality traits measured with the BQF-NA (Del Barrio et al., 2006) were as follows: .32 (conscientiousness), .38 (openness), .29 (extroversion), .37 (agreeableness), and -.39 (neuroticism), with $p < .001$ for all of them.

3.4. Criterion validity

The results show that, beyond the demographic variables of age and gender, emotional competence predicted prosocial behaviour (β = .26, $p < .000$). It also predicted adolescents' difficulties of adaptation (β = -.56, $p < .001$) and self-esteem (β = .66, $p < .001$). The total variance explained for prosocial behaviour was 5% when only demographic variables were included and 11% when emotional competence was included. In relation to adjustment difficulties, demographic variables explained 0% of the variance, while adding emotional intelligence increased the explained variance to 31%. For self-esteem, the explained variance went from 4% to 61% (see Tables 2, 3, and 4).

3.5. Incremental validity

We analysed the results obtained from the 173 participants who responded to the three questionnaires that measured prosocial behaviour, personality dimensions, and emotional competence.

TABLE 2. Regression analysis. Prediction of prosocial behaviour based on emotional competence measured with the CDE-SEC.

Predictors	Non-standardised coefficients		Standardised coefficients	*t*	Sig.		
	B	Standard error	Beta			R^2	ΔR^2
Step 1. Demographic variables						.048	.048
(Constant)	10.497	.820		12.806	.000		
Age	-.116	.056	-.081	-2060	.040		
Gender	-716	.133	-.211	-5393	.000		
Step 2. Emotional competence						.113	.065
(Constant)	3.167	892		8.654	.000		
Age	.009	.055	-.054	-1432	.153		
Gender	.115	.129	-.234	-6.154	.000		
Emotional competence (CDE-SEC)	.002	.002	.257	6.757	.000		

Note: $n = 629$; dependent variable: prosocial behaviour.

TABLE 3. Regression analysis. Prediction of adjustment difficulties based on emotional competence measured with the CDE-SEC.

Predictors	Non-standardised coefficients		Standardised coefficients	*t*	Sig.		
	B	Standard error	Beta			R^2	Adj. R^2
Step 1. Demographic variables						.003	.003
(Constant)	13.185	2.673		4.932	.000		
Age	.115	.184	.025	.622	.534		
Gender	-.512	.433	-.047	-1.181	.238		
Step 2. Emotional competence						.316	.313
(Constant)	32.615	2.497		13.061	.000		
Age	-.150	.154	-.033	-.977	.329		
Gender	.023	.361	.002	.065	.948		
Emotional competence (CDE-SEC)	-.078	.005	-.565	-16.897	.000		

Note: n = 629; dependent variable: adjustment difficulties.

TABLE 4. Regression analysis. Prediction of self-esteem based on emotional competence measured with the CDE-SEC.

Predictors	Non-standardised coefficients		Standardised coefficients	*t*	Sig.		
	B	Standard error	Beta			R^2	ΔR^2
Step 1. Demographic variables						.043	.043
(Constant)	25.422	4.245		5.989	.000		
Age	-.172	.288	-.032	-.599	.550		
Gender	2.284	.602	.202	3.794	.000		
Step 2. Emotional competence						.466	.423
(Constant)	7.170	3.366		2.130	.034		
Age	-.121	.215	-.022	-.564	.573		
Gender	1.398	.454	.124	3.082	.002		
Emotional competence (CDE-SEC)	.089	.005	.655	16.397	.000		

Note: n = 344; dependent variable: self-esteem.

- Prosocial behaviour. In the first step, we found that age did not predict prosocial behaviour, but gender did, with female students being more inclined to behave prosocially. In the second step, we obtained that only agreeableness predicted prosocial behaviour. In the third step of the analysis, when emotional competence was measured with CDE-SEC, an additional predictive power of 3% was found.

- Personality dimensions. In the first step, neither gender nor age predicted adjustment difficulties. In the second step, we found that openness was the only one of the personality dimensions to predict prosocial behaviour. In step three, the emotional competence measured with the CDE-SEC contributed an additional predictive power of 34% (see Tables 4, 5, and 6).

- Emotional competence. Neither age nor gender predicted self-esteem. Instead, Instead, three personality dimensions did: conscientiousness, openness and extroversion. As for emotional competence measured with the CDE-SEC, this provided an additional capacity of explanation of 29% (see Table 7).

4. Discussion

The aim of this study is to present the psychometric properties of the CDE-SEC, an instrument that aims to

TABLE 5. Regression analysis. Prediction of prosocial behaviour based on personality and emotional competence measured with the CDE-SEC.

Predictors	Non-standardised coefficients		Standardised coefficients	*t*	Sig.		
	B	Standard error	Beta			R^2	ΔR^2
Step 1. Demographic variables						.134	.134
(Constant)	12.242	1.592		7.689	.000		
Gender	-.205	.111	-.133	-1.855	.065		
Age	-1.218	.244	-.359	-4.997	.000		
Step 2. Personality						.252	.109
(Constant)	7.364	1.946		3.784	.000		
Gender	-.184	.106	-.119	-1.733	.085		
Age	-1.155	.245	-.340	-4.715	.000		
Conscientiousness	.012	.018	.071	.650	.517		
Openness	-.006	.031	-.020	-.204	.838		
Extroversion	.036	.025	.117	1.425	.156		
Agreeableness	.075	.033	.216	2.280	.024		
Neuroticism	-.010	.017	-.043	-.586	.558		
Step 3. Emotional competence						.281	.029
(Constant)	6.456	1946		3.318	.001		
Gender	-.183	.104	-.119	-1.757	.081		
Age	-1.188	.241	-.350	-4.925	.000		
Conscientiousness	.010	.018	.060	.563	.574		
Openness	-.018	.031	-.057	-.576	.565		
Extroversion	.033	.025	.107	1.335	.184		
Agreeableness	.064	.033	.183	1.943	.054		
Neuroticism	-.003	.017	-.012	-.164	.870		
Emotional competence (CDE-SEC)	.008	.003	.191	2.587	.011		

Note: $n = 173$; dependent variable: prosocial behaviour.

TABLE 6. Regression analysis. Prediction of adjustment difficulties based on personality and emotional competence measured with the CDE-SEC.

Predictors	Non-standardised coefficients		Standardised coefficients	*t*	Sig.		
	B	Standard error	Beta			R^2	ΔR^2
Step 1. Demographic variables						.010	.010
(Constant)	9.374	5.392		1.739	.084		
Gender	.400	.374	.082	1.070	.286		
Age	-.510	.825	-.047	-.618	.537		
Step 2. Personality						.214	.204
(Constant)	16.618	6.317		2.631	.009		
Gender	.260	.344	.053	.755	.451		
Age	.137	.795	.013	.173	.863		
Conscientiousness	-.010	.058	-.019	-.174	.862		
Openness	-.311	.102	-.310	-3.045	.003		
Extroversion	.075	.082	.077	.917	.361		
Agreeableness	-.121	.107	-.109	-1.128	.261		
Neuroticism	.139	.054	.190	2.557	.011		

Step 3. Emotional competence						.556	.342
(Constant)	26.466	4.842		5.466	.000		
Gender	.253	.259	.052	.975	.331		
Age	.494	.600	.046	.824	.411		
Conscientiousness	.008	.044	.016	.192	.848		
Openness	-.186	.078	-.185	-2.384	.018		
Extroversion	.106	.062	.108	1.710	.089		
Agreeableness	.005	.082	.004	.061	.951		
Neuroticism	.062	.042	.085	1.500	.136		
Emotional competence (CDE-SEC)	-.088	.008	-.655	-11.272	.000		

Note: n = 173; dependent variable: adjustment difficulties.

TABLE 7. Regression analysis. Prediction of self-esteem based on personality and emotional competence measured with the CDE-SEC.

Predictors	**Non-standardised coefficients**		**Standardised coefficients**	***t***	**Sig.**		
	B	**Standard error**	**Beta**			R^2	ΔR^2
Step 1. Demographic variables						.050	.050
(Constant)	28.602	5.762		4.964	.000		
Gender	-.399	.402	-.077	-.994	.322		
Age	2.315	.889	.201	2.604	.010		
Step 2. Personality						.258	.208
(Constant)	22.205	6.747		3.291	.001		
Gender	-.343	.365	-.066	-.940	.349		
Age	1.138	.846	.099	1.344	.181		
Conscientiousness	-.097	.063	-.173	-1.534	.127		
Openness	.426	.108	.392	3.942	.000		
Extroversion	.165	.087	.160	1.888	.061		
Agreeableness	.033	.120	.028	.272	.786		
Neuroticism	-.164	.058	-.209	-2.835	.005		
Step 3. Emotional competence						.537	.279
(Constant)	12.545	5.435		2.308	.022		
Gender	-.364	.289	-.070	-1.259	.210		
Age	.780	.671	.068	1.162	.247		
Conscientiousness	-.133	.050	-.236	-2.635	.009		
Openness	.298	.087	.274	3.444	.001		
Extroversion	.137	.069	.133	1.982	.049		
Agreeableness	-.055	.095	-.047	-.582	.561		
Neuroticism	-.080	.047	-.102	-1.716	.088		
Emotional competence (CDE-SEC)	.086	.009	.600	9.710	.000		

Note: n = 164; dependent variable: self-esteem.

measure the emotional competence of young people in secondary education.

The results obtained show that the complete scale of 33 items of the CDE-SEC displays a high reliability of .87, measured using Cronbach's alpha.

For the study of convergent validity, the analysis of the correlation between the CDE-SEC and the TEIQue scale (Petrides, 2009) (a widely recognised measure of trait emotional intelligence) confirms that the two questionnaires correlate strongly and positively with each other. Furthermore, the CDE-SEC correlates significantly with all of the subscales of the TEIQue. These results support the hypothesis that the CDE-SEC evaluates emotional intelligence.

Similarly, the correlations between the CDE-SEC and the five personality traits measured with the BQF-NA (Del Barrio et al., 2006) are confirmed. The results show that CDE-SEC correlates negatively with neuroticism and positively with conscientiousness, openness, extroversion, and agreeableness. These results agree with other previous studies on trait emotional intelligence and emotional competence (Petrides et al., 2007; Parodi et al., 2017). As trait emotional intelligence is a transversal personality construct (Petrides et al., 2007), any instrument for measuring it must necessarily correlate substantially with the big five personality traits. The CDE-SEC fulfils this requirement.

The results of the incremental validity study show that emotional competence, measured by the CDE-SEC, predicts prosocial behaviour, young people's difficulties, and self-esteem. The higher their level of emotional competence, the more aware young people are of their own emotions and the needs of others, their relationships are more positive and satisfactory, and their prosocial behaviours increase (González-Yubero et al., 2021; Ruvalcaba-Romero et al., 2017). Similarly, emotional competences increase adolescents' self-esteem as they have resources to face difficulties, and so help with their psychological development (Anto & Jayan, 2016; Cheung et al., 2015). Therefore, emotional competence has a direct impact on the cognitive valuations of life and on adaptive behaviour, as well as with the individual's overall perception of his or her self; findings that have also been identified in other studies (Orozco, 2021; Petrides et al., 2007; Vargas et al., 2018).

In parallel, we observed that while age did not predict prosocial behaviour, gender did, with female students being more inclined to behave prosocially. These results agree with others from previous works on gender differences (Hernández-Serrano, 2016; González & Moreno, 2022). We also found that only agreeableness predicted prosocial behaviour. Although this concept is little explored, some researchers have found a correlation between use of cooperative strategies to resolve conflicts and greater agreeableness (Garaigordobil et al., 2016). So, agreeableness probably has a positive influence on adolescents' disposition to resolve conflicts in a prosocial way. Emotional competence measured with the CDE-SEC demonstrated the capacity to predict prosocial behaviour above the different personality dimensions.

As for the prediction of adjustment difficulties, we did not find evidence for gender or for age. These results do not coincide with other studies such as those by Schoeps et al. (2021) and García & Gómez-Baya (2022), which indicate that girls display more emotional symptoms (anxiety, fear, and low mood), while boys display behavioural problems (aggressive or antisocial behaviour), giving rise to different ways of adapting to the physical and psychological changes of puberty.

The CDE-SEC also demonstrated its power of prediction above the different personality dimensions. In addition, we found that the openness personality trait negatively predicted adjustment difficulties. This finding is similar to other studies that find that some personality traits seem to be better at explaining or predicting the presence of certain problems in adolescence (Molina et al., 2014).

Furthermore, in our study, neither age nor gender predicted self-esteem. These results are not new in the literature. For example, Orth et al. (2018) also did not find significant differences in self-esteem by gender. Nonetheless, more recent studies indicate that boys tend to display higher levels of self-esteem than girls (Gardner & Lambert, 2019) and that these increase with age (Bleidorn et al., 2016).

In contrast, we found that, in relation to personality, the dimensions of conscientiousness, openness, and extroversion predicted self-esteem. These results are consistent with earlier studies that show that self-esteem is associated positively with openness, conscientiousness, extroversion, agreeableness, stability, and plasticity and negatively with neuroticism (Wagner & Gerstorf, 2017), so that the personality traits could affect self-esteem (Simkin et al., 2018). On the same

lines, emotional competence measured with the CDE-SEC was also found to provide unique information about self-esteem in addition to that provided by the personality dimensions.

This work's main strength is the formulation of an instrument that makes it possible to assess secondary-school students' level of emotional competence. In addition, the correlations between the results of the CDE-SEC and recognised measures of emotional intelligence, personality, self-esteem, adjustment difficulties and social behaviour, provide sufficient evidence for its usefulness and pertinence in guidance processes. For their part, the limitations of the work should be reviewed, such as the relatively low alpha reliability figures for the variables of *adjustment difficulties* and *prosocial behaviour*. These coefficients, however, are similar to those obtained in previous studies (see Di Riso et al., 2010). Moreover, this instrument's explained variance is not very high, limiting its capacity to inform about the variation in the data obtained. This drawback is partially offset by the fact that the instrument has demonstrated different types of validity and high reliability.

Given these limitations, there is a need for new studies to replicate the findings obtained from partial samples. Increasing the number of participants and including representation of different educational and social contexts would be useful. It would also be of value to carry out longitudinal studies to investigate the stability of the instrument over time. Additional studies can help to understand better the possible relationships between trait emotional intelligence, the big-five personality dimensions, and predictor variables of prosocial behaviour. It would also be of interest to study the relationship between emotional intelligence and other variables to predict clinical symptoms such as anxiety or depression and so develop prevention and intervention measures.

We believe that having instruments that evaluate emotional competences is a vital requirement for the design and development of educational programmes to promote emotional education. Emotional education has multiple benefits for young people as it plays an important role in preventing socioemotional problems and in personality development. As well as favouring psychological adjustment, emotional competence is key in moments in which important developmental changes can threaten adolescents' emotional development and well-being (Merino et al., 2023).

5. Conclusions

The CDE-SEC has proven to be an instrument that is solidly founded, valid, and reliable, with psychometric properties that are appropriate and adequate for measuring the emotional competence of students in secondary education. It also has the capacity to predict other important aspects of adolescents' development such as prosocial behaviour, adjustment difficulties, and self-esteem, and this predictive capacity is still maintained when personality is included in the regression equations. The applications of the CDE-SEC in the educational sphere contribute to the design and evaluation of educational guidance programmes, as well as to the personalised support for students in secondary education to promote social and emotional development.

References

Álvarez-González, M. (2017). Hacia un modelo integrador de la tutoría en los diferentes niveles educativos [Towards an integrative tutoring model across different educational levels]. *Revista Educatio Siglo XXI*, *35* (2), 21-42. https://doi.org/10.6018/j/298501

Álvarez-González, M., & Álvarez-Justel, J. (2015). Relación de programas de educación emocional [List of emotional education programmes]. En M. Álvarez-González, & R. Bisquerra (Coords.), *Manual de orientación y tutoría [Guidance and mentoring manual]*. Wolters Kluwer Educación.

Álvarez-Justel, J. (2021). Construcción y validación inicial de la escala de toma de decisiones de la carrera en secundaria (ETDC-S) [Initial development and validation of the secondary-school academic and career decision-making scale]. *Electronic Journal Research in Educational Psychology, 19* (3), 605-624. https://doi.org/10.25115/ejrep.v19i55.4322

Álvarez-Justel, J., & Álvarez-González, M. (2022). *Tutoría y orientación en secundaria. Recursos para la intervención [Tutoring and guidance in secondary education. Resources for intervention]*. Pirámide.

Amutio, A., López-González, L., Oriol, X., & Pérez-Escoda, N. (2020). Predicción del rendimiento académico a través de la práctica de relajación-meditación-mindfulness y el desarrollo de competencias emocionales [Predicting academic performance through relaxation-meditation-mindfulness and emotional competences]. *Universitas Psychologica*, *19*. https://revistas.javeriana.edu.co/index.php/revPsycho/article/view/28395

Anto, S. P., & Jayan, C. (2016). Self-esteem and emotion regulation as determinants of mental health of youth. *Journal of Projective Psychology & Mental Health*, *23* (1), 34-40.

Barbaranelli, C., Carpara, G., Rabasca, A., & Pastorelli, C. (2003). A questionnaire for measuring the big five in late childhood. *Personality and Individual Differences*, *34* (4), 645-664. https://doi.org/10.1016/S0191-8869(02)00051-X

Bisquerra, R., & Pérez-Escoda, N. (2007). Las competencias emocionales [Emotional competencies]. *Educación XXI*, (10), 61-82.

Bleidorn, W., Arslan, R. C., Denissen, J. J. A., Rentfrow, P. J., Gebauer, J. E., Potter, J., & Gosling, S. D. (2016). Age and gender differences in self-esteem: A cross-cultural window. *Journal of Personality and Social Psychology*, *111* (3), 396-410. https://doi.org/10.1037/pspp0000078

Cejudo, M. J. (2015). *Diseño, desarrollo y evaluación del programa «Dulcinea» de educación emocional en un centro de educación secundaria desde la integración de modelos de inteligencia emocional [Design, development and evaluation of the "Dulcinea" emotional education programme in a secondary school based on the integration of emotional intelligence models]* [Doctoral dissertation]. E-spacio: repositorio institucional de la Universidad Nacional de Educación a Distancia. http://e-spacio.uned.es/fez/view/tesisuned:Educacion-Jcejudo

Cheung, C. K., Cheung, H. Y., & Hue, M. T. (2015). Emotional intelligence as a basis for self-esteem in young adults. *The Journal of Psychology: Interdisciplinary and Applied*, *149* (1), 63-84. https://doi.org/10.1080/00223980.2013.838540

Del Barrio, V., Carrasco, M. A., & Holgado, F. P. (2006). *BFQ-NA. Cuestionario «big five» de personalidad para niños y adolescentes [BFQ-NA. Big five personality questionnaire for children and adolescents].* TEA Ediciones.

Di Riso, D., Salcuni, S., Chessa, D., Raudino, A., Lis, A., & Altoè, G. (2010). The strengths and difficulties questionnaire (SDQ). Early evidence of its reliability and validity in a community sample of Italian children. *Personality and Individual Differences*, *49 (6)*, 570-575. https://doi.org/10.1016/j.paid.2010.05.005

Durlak, J. A., Weissberg, R. P., & Pachan, M. (2010). A meta-analysis of after-school programs that seek to promote personal and social skills in children and adolescents. *American journal of community psychology*, *45* (3-4), 294-309. https://doi.org/10.1007/s10464-010-9300-6

Eusebio, P. (2021). *Educación emocional, una mirada hacia el presente en educación integral* [Emotional education, a look at the present in comprehensive education]. Editorial Inclusión.

Ferrándiz, C., Hernando, D., Bermejo, R., Ferrando, M., & Sáinz, M. (2012). La inteligencia emocional y social en la niñez y adolescencia: validación castellana de un instrumento para su medida [Social and emotional intelligence in childhood and adolescence: Spanish validation of a measurement instrument]. *Revista de Psicodidáctica*, *17* (2), 309-339. http://hdl.handle.net/10810/48272

Ferrer-Esteban, G. (2023). *Orientació educativa: envers un model d'orientació integrat per prevenir l'abandonament escolar [Educational guidance: Towards an integrated guidance model to prevent school dropouts].* Fundació Bofill.

Fiske, D. W. (1949). Consistency of the factorial structures of personality ratings from different sources. *The Journal of Abnormal and Social Psychology*, *44* (3), 329-344. https://doi.org/10.1037/h0057198

García, P., Goodman, R., Mazaira, J., Torres, A., Rodríguez-Sacristán, J., Hervas, A., & Fuentes, J. (2000). El cuestionario de capacidades y dificultades [The strengths and difficulties questionnaire]. *Revista de Psiquiatría Infanto-Juvenil*, (1), 12-17. https://aepnya.eu/index.php/revistaaepnya/article/view/443

García, E., & Gómez-Baya, D. (2022). El papel mediador de la inteligencia emocional y la autoestima en las diferencias de género en síntomas depresivos en una muestra de adolescentes [The mediational role of emotional intelligence and self-esteem in gender differences in depressive symptoms in a sample of adolescents]. *Análisis y Modificación de Conducta*, *48* (178), 27-40. https://doi.org/10.33776/amc.v48i178.7344

Garaigordobil, M., Machimbarrena, J., & Maganto, C. (2016). Adaptación española de un instrumento para evaluar la resolución de conflictos (Conflictalk): Datos psicométricos de fiabilidad y validez [Spanish adaptation of an instrument to assess conflict resolution (Conflictalk): Psychometric data of reliability and validity]. *Revista de Psicología Clínica con Niños y Adolescentes*, *3* (2), 59-67. https://www.revistapcna.com/sites/default/files/16-23.pdf

Gardner, A. A., & Lambert, C. A. (2019). Examining the interplay of self-esteem, trait emotional intelligence, and age with depression across adolescence. *Journal of Adolescence*, *71* (2), 162-166. https://doi.org/10.1016/j.paid.2016.08.022

Gómez-Baya, D., Mendoza, R., Paino, S. y Gaspar, M. (2017). Perceived emotional intelligence as a predictor of depressive symptoms during mid-adolescence: A two-year longitudinal study on gender differences. *Personality and Individual Differences*, *104*, 303-312. https://doi.org/10.1016/j.paid.2016.08.022

González, A., & Molero, M. M. (2022). Creatividad, habilidades sociales y comportamiento prosocial en adolescentes: diferencias según sexo [Creativity, social skills and prosocial behaviour in adolescents: Differences according to sex]. *Publicaciones*, *52* (2), 117-144. https://doi.org/10.30827/publicaciones.v52i2.26184

González-Yubero, S., Lázaro-Visa, S., & Palomera, R. (2021). ¿Qué aporta la inteligencia emocional al estudio de los factores personales protectores del consumo de alcohol en la adolescencia? [How does emotional intelligence contribute to the study of personal protective factors for alcohol consumption in adolescence?]. *Psicología Educativa*, *27* (1), 27-36. https://doi.org/10.5093/psed2020a13

Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, *38* (5), 581-586. https://doi.org/10.1111/j.1469-7610.1997.tb01545.x

Hernández-Serrano, O., Espada, J. P., & Guillén-Riquelme, A. (2016). Relación entre conducta prosocial, resolución de problemas y consumo de drogas en adolescentes [Relationship of the prosocial behaviour, the problem-solving skills and the use of drugs amongst adolescents]. *Anales de Psicología*, *32* (2), 609-616. https://doi.org/10.6018/analesps.32.2.204941

Kersten, P., Czuba, K., McPherson, K., Dudley, M., Elder, H., Tauroa, R., & Vandal, A. A. (2015). A systematic review of evidence for the psychometric properties of the strengths and difficulties questionnaire. *International Journal of Behavioral Development*, *40* (1), 1-12. https://doi.org/10.1177/0165025415570647

Martín-Albo, J., Núñez, J. L., Navarro, J. G., & Grijalvo, F. (2007). The Rosenberg self-esteem scale: Translation and validation in university students. *The Spanish Journal of Psychology*, *10* (2), 458-467. https://doi.org/10.1017/S1138741600006727

McCrae, R. R., & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, *52* (1), 81-90. https://doi.org/10.1037/0022-3514.52.1.81

Merino, C., Flores, P., & Mora, J. C. (2023). La inteligencia emocional y la incidencia en la conducta de la persona [Emotional intelligence and its impact on the person's behavior]. *Domino de las Ciencias*, *9* (1), 289-310. https://dominiodelasciencias.com/ojs/index.php/es/article/view/3136

Mestres, L. (2022). Educar emocionalmente en un mundo hiperconectado e hipertecnológico [Emotionally educating in a hyper-connected and hyper-technological world]. In N. Pérez-Escoda, & E. López-Cassà (Eds.), *Retos para el bienestar social y emocional [Challenges to social and emotional well-being]* (pp. 149-174). Wolters Kluwer.

Midgett, A., Doumas, D., & Johnston, A. (2017). Establishing school counselors as leaders in bullying curriculum delivery: Evaluation of a brief, school-wide bystander intervention. *Professional School Counseling*, *21* (1). https://doi.org/10.1177/2156759X18778781

Molina, S., Inda, M., & Fernández C. M. (2014). La personalidad como predictora de dificultades cotidianas en la adolescencia [Personality features as predictors of different problems in adolescence]. *Revista Española de Orientación y Psicopedagogía, 20* (2), 109-122. https://doi.org/10.5944/reop.vol.20.num.2.2009.11444

Montes-Solís, F., Rodríguez, L., Guzmán, F. R., & López, K. S. (2023). Autoestima, autoeficacia, conducta prosocial y el consumo de alcohol en adolescentes escolarizados [Self-esteem, self-efficacy, prosocial behavior and alcohol consumption in school adolescents]. *Health and Addictions/Salud y Drogas*, *23* (1), 368-381. https://doi.org/10.21134/haaj.v23i1.799

Orozco, M. G. (2021). Inteligencia emocional, empatía y buen trato como factores protectores frente a la agresión física en adolescentes [Emotional intelligence, empathy and warmth as protective factors against physical aggression in adolescents]. *Revista CES Psicología*, *14* (2), 1-19. https://doi.org/10.21615/cesp.5222

Orth, U., Erol, R. Y., & Luciano, E. C. (2018). Development of self-esteem from age 4 to 94 years: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *144* (10), 1045-1080. https://doi.org/10.1037/bul0000161

Parodi, A., Belmonte, V., Ferrándiz, C., & Ruiz, M. J. (2017). La relación entre la inteligencia emocional y la personalidad en estudiantes de educación secundaria [The relationship between emotional intelligence and personality in secondary education students]. *International Journal of Developmental and Educational Psychology*, *2* (1), 137-143. https://doi.org/10.17060/ijodaep.2017.n1.v2.926

Peña-Casares, M. J., & Aguaded-Ramírez, E. M. (2019). Evaluación de la inteligencia emocional en el alumnado de educación primaria y educación secundaria [Emotional intelligence assessment in primary and secondary education students]. *Revista de Educación de la Universidad de Granada*, *26*, 53-68. https://doi.org/10.30827/reugra.v26i0.118

Pérez-Escoda, N. (2016). Cuestionarios del GROP para la evaluación de la competencia emocional (CDE) [GROP questionnaires for the evaluation of emotional competence (CDE)]. In J. L. Soler, O. Díaz, E. Escolano-Pérez, & M.A. Rodríguez (Coords.), *Inteligencia emocional y bienestar II. Reflexiones, experiencias profesionales e investigaciones [Emotional intelligence and well-being II. Reflections, professional experiences and research]* (pp. 690-705). Ediciones Universidad San Jorge.

Pérez-Escoda, N., & Filella, G. (2019). Educación emocional para el desarrollo de competencias emocionales en niños y adolescentes [Emotional learning for developing emotional skills in children and adolescents]. *Praxis & Saber, 10* (24), 23-44. https://doi.org/10.19053/22160159.v10.n25.2019.8941

Pérez-Escoda, N., & López-Cassà, È. (Coords.) (2022). *Retos para el bienestar social y emocional [Challenges to social and emotional well-being]*. Wolters Kluwer.

Pérez-Escoda, N., López-Cassà, È. & Alegre, A. (2021). Emotional development questionnaire for primary education (CDE_9–13). *Education Sciences*, *11* (11), 704. https://doi.org/10.3390/educsci11110704

Petrides, K. V. (2009). Psychometric properties of the trait emotional intelligence questionnaire (TEIQue). In C. Stough, D. H. Saklofske, & J. D. A. Parker (Eds.), *Assessing emotional intelligence: Theory, research, and applications* (pp. 85-101). Springer Science + Business Media. https://doi.org/10.1007/978-0-387-88370-0_5

Petrides, K. V., Pita, R., & Kokkinaki, F. (2007). The location of trait emotional intelligence in personality factor space. *British Journal of Psychology*, *98* (2), 273-89. https://doi.org/10.1348/000712606X120618

Petrides, K. V., Sangareau, &., Furnham, A., & Frederickson, N. (2006). Trait emotional intelligence and children's peer relations at school. *Social Development*, *15* (3), 537-547. https://doi.org/10.1111/j.1467-9507.2006.00355.x

Rodríguez-Ledo, C., Orejudo, S., Celma, L., & Cardoso, M. J. (2018). Mejora de las competencias socioemocionales en el aula, con jóvenes de educación secundaria, mediante el programa SEA [Improving social-emotional competencies in the secondary education classroom through the SEA program]. *Revista de Investigación Psicoeducativa*, *3* (16), 681-701. https://doi.org/10.25115/ejrep.v16i46.2241

Ros-Morente, A., Cabello, E., & Filella, G. (2018). The effect of two emotional education programs in emotional and well-being variables in children and adolescents. *Journal of Emerging Technologies in Learning (iJET), 13* (9), 148-159. https://doi.org/10.3991/ijet.v13i09.7841

Rosenberg, M. (1989). *Society and the adolescent self-image (revised edition)*. Wesleyan University Press.

Ruvalcaba-Romero, N. A., Gallegos-Guajardo, J., & Fuerte, J. M. (2017). Competencias socioemocionales como predictoras de conductas prosociales y clima escolar positivo en adolescentes [Social and emotional skills as predictors of prosocial behavior and positive school climate in adolescence]. *Revista Interuniversitaria de Formación del Profesorado*, *88* (31.1), 77-90. http://hdl.handle.net/10201/120531

Sánchez, L., Rodríguez, G., & García, E. (2018). Desarrollo de competencias emocionales a través del Programa AEdEm para educación secundaria [Emotional competences development through the program AEdEm for secondary education]. *Revista Complutense de Educación*, *24* (1), 35-52. https://doi.org/10.5209/RCED.54402

Schoeps, K., Tamarit, A., Postigo-Zegarra, S., & Montoya-Castilla, I. (2021). Los efectos a largo plazo de las competencias emocionales y la autoestima en los síntomas internalizantes en la adolescencia [The long-term effects of emotional competencies and self-esteem on adolescents' internalizing symptoms]. *Revista de Psicodidáctica*, *26* (2), 113-122. https://doi.org/10.1016/j.psicod.2020.12.001

Simkin, H., & Pérez-Marín, M. (2018). Personalidad y autoestima: un análisis sobre el importante papel de sus relaciones [Personality and self-esteem: An analysis of the important role of their association]. *Terapia psicológica*, *36* (1), 19-25. https://dx.doi.org/10.4067/s0718-48082017000300015

Soto, G., Ferrándiz, C., Sainz, M., Ferrando, F., Prieto, M. D., Bermejo, R., & Hernández, D. (2011). Características psicométricas del cuestionario de personalidad BFQ-NA [Psychometric characteristics of personality questionnaire BFQ-NA]. *Aula Abierta*, *39* (1), 13-24.

Vargas, K., Villoría, Y. A., & López, V. M. (2018). Factores protectores de la conducta prosocial en adolescentes: un análisis de ruta [Protective factors of prosocial conduct in teenagers: A route analysis]. *Revista Electrónica Psicología Iztacala*, *21* (2), 563-589. https://www.revistas.unam.mx/index.php/repi/article/view/65290

Wagner, J., & Gerstorf, D. (2017). Introduction to the special section on self-esteem and personality across the lifespan: Antecedents of development and change. *International Journal of Behavioral Development*, *42* (1), 1-3 https://doi.org/10.1177/0165025416678094

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Book reviews

Colom, T., Sarramona, J., & Vázquez, G. (2023).
Reflexión y práctica pedagógica [Pedagogical reflection and practice]
(Isabel Alvarez i Canovas and Joana Ferrer i Miquel)

Berkowitz, M. W. (2022).
Modelo PRIMED para la educación del carácter. Seis principios esenciales para la mejora escolar [PRIMED for character education: Six design principles for school improvement]
(Unai Buil Zamorano)

Rivas, S., & García-Diego, H. (eds.) (2022).
Escenarios de aprendizaje. Diálogos entre arquitectura, diseño y educación [Educational settings: Dialogues between architecture, design, and education]
(Carmen María Basanta Vázquez)

Book reviews

Colom, T., Sarramona, J. & Vázquez, G. (2023).
Reflexión y práctica pedagógica [Pedagogical reflection and practice].
Horsori. 154 pp.

Pedagogical reflection and practice is the latest publication by three authors who have considerable experience and notable careers, characterised by underlining and publicising the connections between educational theory and practice. An approach that, while may not surprise people from other fields, is not common in the world of pedagogy.

It is true that, in recent times, the need to link theory-reflection-research with praxis, experience and contextualisation has been demanded in many educational innovation projects. This, however, has not been translated into concrete pedagogical proposals. Hence the value of the present work. Hence the value of this work.

The book we discuss here is divided into three chapters. In the first, Toni Colom considers the theory of science and the theory of education from an epistemological perspective. He provides a systematic overview of this debate, embodied in the proposals by Mario Bunge and Karl Popper, through which he delves into the complexity of education from a preferably qualitative approach. This enables him to respond to what escapes logical linearity. In other words, he is oriented towards a singular, unfathomable, and unknown self-organisation, with the various contributions of Humberto Maturana and Edgar Morin, among others. The author reminds us that education is hazardous and complex. Therefore, educational realities must be approached with an open and undefined structure of knowledge. All of this leads us to the current debate about the possible innovations that will have to be implemented when tools such as ChatGPT or similar are present in classrooms. We will have to explore the dimension of what is "undefined" in the broadest extent of the concept, creating opportunities for challenges that are hard to predict.

Afterwards, Colom proceeds to bring all of the discourse about the origin and evolution of the theory of education towards its material existence, towards its practical application, both in regards to the material objects through which we teach and to the individuals who are at the centre of this process (without them, there is no education, as the author reminds us). Furthermore, in order to be able to advance, this practice must be based on critical reflection, on moral-axiological criteria that address teachers in their day-to-day work. We are also reminded that pedagogical practice starts from a technological foundation to locate this practical-reflexive orientation in the interests of a pragmatic instrumentalization. At this point, James and Dewey are mentioned as some of the authors who represent this basis.

In the second chapter, Gonzalo Vázquez takes up Colom's idea of technological reason . He suggests that the link between theory and practice is to be found in the principles and strategies implemented in different learning situations. For example, in the use of experiences (as a Deweyian concept) and/or simulations to be able to reach the desired transference, put in place and increased in a variety of educational settings through this technology. All of this is with the basic idea of incorporating processes of dialogue (internal and external) through observation, on condition that it is supported and corrected by critical, informed reflection. The author places particular emphasis on how emotions, both individual and group, contribute as a fundamental part of learning processes, underlining their undoubted impact in deep learning. Therefore, it is vitally important to be able to put in place the conditions, both internal and external, for self-knowledge.

It is on self-knowledge that the author bases the idea of maturity and cognitive equilibrium. This is of special interest for training our future teachers, individuals who encounter the dilemmas typical of this changing and sometimes bleak society. One example of this is the current debate over artificial intelligence, which brings us closer to what is unplanned, to what has not yet happened. Having a new, privileged window, even if it exceeds human cognition in speed on many levels, elicits as much wonder as insecurity. However, it is another element for shaping principles and strategies between educational theory and mindful, effective, and rigorous practice. As Vázquez notes, educational action presents the two faces of Janus: it is at, the same time, structuring and unbalancing, although we would add that it is also vibrant.

The proposal closes with a third chapter which focusses on what its author, Jaume Sarramona, calls the "materialisation of educational action". The fact is that theory contributes (as it should) to transforming reality, to making each student's learning possible from his or her own context and uniqueness. The author meticulously addresses and expands the materialisation of theory as "form", presenting the meaningful elements that comprise the action of professionalism in teachers. And with this intent, he positions the activity of didactic planning as the heart of school educational practice.

It is strongly recommended that teachers with little experience and also those with most expertise carefully read all of the key elements that must be taken into account in classroom planning, which the author spells out and, more notably, how all of them are given a sequenced time and space throughout the educational process.

Sarramona analyses the extent to which planning is a sign of professionalism in teachers. He follows the principles of prediction and precaution, but also included the artistic and creative aspect, in order to be able to give way to the necessary capacity for flexibility that continuous learning requires. Planning and, at the same time, being flexible in order to be able to approach the purposes of education. In this way, the questions of why we have to educate and what we educate for can be answered. Planning and flexibility to personalise learning with a variety of strategies and resources that the author offers with clear summary schemes, based on practical formulations and advice with various resources.

Evaluation is shown to be a process that cuts across all of the planned didactic sequence. This evaluation's main objective is to help students in their process of self-regulation. This evaluation must be at the heart of the rhythm and style of all learning, requiring teachers to construct instruments for systematic observation that make it possible to measure results and verify the fitness of the educational materialisation as proposed and implemented.

Toni J. Colom, J. Sarramona, and G. Vázquez offer us wise pages in this joint book that combine theoretical knowledge and a practice-based outlook, a valuable tool for current and future teachers, as well as for the people who train them.

Dr Isabel Alvarez i Canovas
and Dr Joana Ferrer i Miquel ■

Berkowitz, M. W. (2022).

Modelo PRIMED para la educación del carácter. Seis principios esenciales para la mejora escolar [PRIMED for character education: Six design principles for school improvement]. EUNSA. 355 pp.

To be, or not to be, that is the question. As it is in character education as well. In his pedagogical research, Marvin Berkowitz reduces the problem he confronts to its most basic components, as Shakespeare already did in the field of literature, and, in so doing, uncovers the metaphysical scope of his professional endeavour. In the case of *PRIMED for character education*, this undertaking is based on teaching and, as noted above, appeals to what is most radical, which is "how to be" and "how to live" (p. 4). Throughout this work, this is precisely a matter of attaining an effective practice to achieve "the flourishing of human goodness in schools" (p. 4), which is what gives most meaning to people's life and being. This goodness is considered in the spirit of his book as "the inclination and capacity to make the world a more just and compassionate place for everyone and for that to be central to one's sense of self" (p. 16). The purpose of this publication, expressed in more detail, is set out straightforwardly: "how we can build a better world through understanding, committing to, and acting upon what is most effective in nurturing the flourishing of human goodness, especially in kids" (p. 3). Through guidelines and specific examples largely implemented by notable or pioneering educators, Berkowitz clarifies the most appropriate way to achieve this objective of goodness, which must emanate from the "inner core, in other words, our character" (p. 4).

Modelo PRIMED para la educación del carácter is marked by great sharpness of ideas, fluent exposition, and conceptual clarity. It revolves around six central ideas that are, as the subtitle states, the six essential principles for improving schools. PRIMED, in fact, is an acronym based on these six ideas or "design principles" that connect "to guide the construction of an comprehensive, evidence-based, and effective character education initiative" (p. 172). These principles are priority, relationship building, intrinsic motivation, modelling goodness, empowering students, and developmental (pedagogy), as stated in the book's table of contents. The author devotes a chapter to each of these elements, divided in turn into multiple sub-sections. Similarly, the detailed explanation of these six essential nuclei is preceded by an introductory chapter and is rounded off, in a final section, by a series of closing considerations and notes summarising what has been presented. The book has a total of eight parts or chapters.

In line with the above, it could be said that the author proposes a guide for "effective" character education that illuminates and makes it possible to intervene in how "we *be* with others and then what we *do* as a consequence" (p. 5) in the context of achieving goodness in the learning of children and adolescents, the fundamental objective of the book. Indeed, "effective practice, grounded in deep understanding, is the heart of this book" (p. 4). Consequently, there can be no opposition between being and doing: "we want a synergy between being and doing and having it all grounded in a deep understanding (knowing) of character, character development, and character education" (p. 7). However, there is a precedence of being over doing and, specifically, of teachers' being over their formative (or better performative) activities in students. In effect, it "is first of all a matter of *being* and then a matter of doing" (p. 4). In other words: "If we want to redesign schools or classrooms, we have to first redesign ourselves... *our way of being*" (p. 6). The question, of course, is how we go about doing this task. If Berkowitz takes us away from something in this book, it is the idea that there is a handbook to be applied directly or instantly that leads to achieving the desired product: "schools make the mechanical mistake all the time" (p. 6) when, in reality, "there are no simple litmus tests of character" (p. 131). As Berkowitz observes, "understanding what will effectively foster character development in schools […] is a much more complex chore and will be the focus of most of the rest of this book" (p. 19). The methodological error described above, which is mechanistic in nature, is subsidiary to another that consists of wanting to find solutions to problems where it is perhaps most logical to look for them, but where, in reality, they are not found; in this way, teachers and institutions have often "been focusing instead on some of the well-intentioned but ineffective character education practices" (p. 8). In this regard, "PRIMED is a framework for creating classrooms and schools, which are places where educators and students want to be" (p. 172). However, for a task like this, as noted above, everything must start with the transformation of the personal being of the teachers; a *good* metamorphosis of this type would serve as an example for character education and would favour the transfer to the children of knowledge from the curriculum. Indeed, one of the mantras that Berkowitz repeats most often is that "kids don't care how much you know until they know how much you care", as children are "hypocrisy detectives" (p. 125).

For the author of this book, truly educating means educating *with* the students. Nonetheless, this requires people who are capable of promoting such an undertaking, who are well trained, and who have a talent for leadership that people want to imitate: "students see and hear all you do and say and remember it" (p. 128). Consequently, "character education starts in your mirror […] it must start with the adults" (p. 127), as there can never be "a great school without a great leader, and […] never […] a great character education school without a great character educator as the leader" (p. 61). At an institutional level, the main general methodological challenge for the management of educational centres is to discover how to integrate character education with the curriculum effectively, in a way that is effective for development, which is critical for a structural support that makes it possible to prioritise character education.

Regarding the six PRIMED principles set out above, "prioritising" character education implies that it is not principally a means for academic success but that, above all, we must value nourishing goodness simply because goodness matters. However, if prioritisation must be effective in order to have performative reach in the being of the students, "it should be clear that it is important to talk about about character and to have useful language with which to do so. Core character concepts are certainly a main part of that" (p. 43). In this regard, Berkowitz notes the importance of taking inspiration in pre-established guidelines-frameworks to direct us in the task of forging a noble and

good character, such as the six pillars of character of Character Counts or the publications of Character.org. With regards to the "relationship building" principle, it must be a true priority for character education to be successful; therefore, it is necessary to bear in mind that "the real trick here is that relationship building […] must include all in the school and ideally stakeholders outside the school as well" (p. 80). The third fulcrum of PRIMED is "intrinsic motivation"; in this sense, if our character resides within us and we want to change it, we have to aim at what is inside us. Applied to pupils, we have to discover how to make them internalise what we teach and model. In fourth place, there is the relevance of the "modelling", which, *grosso modo*, has already been set out and which, ultimately, is a transversal factor as, if mechanicism is rejected when achieving character education objectives, one of the operative roads that appears before us is mimesis or modelling. The fifth PRIMED standard ("empowering") illustrates the vital importance of involving students in education and in the management of the school. Faced with the prejudices of "adultism", based on the false belief that they are incapable, too immature, it must be accepted that sharing power brings many challenges, but is necessary for character education. Finally, through the "pedagogy of development", all of the PRIMED structure will be directed at being implemented in the ever-increasing direction, the future, which frames how we educate, with a long-term view and not statically; in effect, children (adults as well, ultimately) are in a process of ascent towards new reference points in their journey of development and pedagogical strategies must be applied to achieve them.

In summary: *Modelo PRIMED para la educación del carácter* urges us to reconsider our approach to classical educational problems and offers us a theoretical-practical framework for solving these challenges in a non-mechanical way, characterised by a conceptual toolkit with a deep philosophical basis. Indeed, according to Berkowitz, character education can only be effectively implemented when the personal being of the teacher and of the school can be modelled in the student learner. However, doing this requires transforming the innermost being of the students towards goodness, something that can only take place thanks to a positive prior metamorphosis: that of the character of the person of the teacher.

Unai Buil Zamorano ■

Rivas, S. & García-Diego, H. (Eds.) (2022).

Escenarios de aprendizaje. Diálogos entre arquitectura, diseño y educación [Educational settings: Dialogues between architecture, design, and education].
Tirant lo Blanch. 409 pp.

In a post-pandemic setting that has required the reformulation of teaching-learning spaces, the pedagogue Sonia Rivas and the architect Héctor García-Diego have published the book *Educational settings: Dialogues between architecture, design, and education*. Although interest in the influence of space on the quality of teaching–learning processes was already present in educational discussions, the context of the health crisis has brought it to the forefront. The book starts from the change in paradigm in the understanding of homes, which were traditionally spaces dedicated to privacy, rest, and family life but have become places for work and study; and how spaces traditionally designed for learning (universities and schools) have been permeated by the need to be places that are accommodating, livable, and capable of embracing vulnerability. The emergency situation and the experience of the summer course on the dialogue between education and architecture organised by the editors at the Universidad de Navarra after the lockdown of 2020, provide a justification and purpose for this book.

Throughout the book, the etymological and necessary connection between the verbs "to learn" and "to inhabit" in Spanish ('aprender' / 'habitar') is repeatedly mentioned. What is learnt is absorbed insofar as it is inhabited (it becomes a habit) and possessed through the senses. Similarly, the spaces where this happens are directly influenced by the greater or lesser possibilities of time and space that architecture facilitates. The value of this book (which features a prologue, an introduction, and twelve chapters) lies both in the contributions made by the twenty-one authors who have participated from the fields of education and architecture and/or design (nine chapters are collaborations between authors from each discipline) and in its editing. Architecture and education open up to each other in a complementary and, at the same time, unifying dialogue.

Stephen Heppell, the author of the prologue, opens by setting out what he believes will be the educational challenges of the next seventy-five years. The innovative focus is the handling of the undeniable paradigm shift that digital tools and social media have introduced both in the endeavour of learning and in comprehension of the material world. Distance learning, which

has a long history, is something more than real in recent years, as Alexi Marmot explains in the introduction. By its very nature, distance learning does not happen in a formal architectural space. Hence the response that Rivas and García-Diego offer in chapter eight on the possibilities and needs for transformation of homes that are the site of remote work and/or learning activities (whether through unavoidable circumstances, like the pandemic, or by choice, for example studying a MOOC) and they open a debate on the best material conditions (light, furnishings, space) and environmental ones (order, routines, and family dynamics) for this to be a success.

The book does not present a linear argument and the chapters do not share a single theory of education or architecture. However, certain questions, reflections, and concepts underlie all of them. One of these is the postmodern concern with ecology and learning. Although also forming part of its relationship with the environment, ecology refers to the question of the total growth of the person in relation to its own nature. Juliette Heppell sets out the case of the Brightlingsea Beach School based on the learning outside the classroom (LoC) methodology. In chapter four, Carolina Ugarte and Jorge Tárrago Mingo consider the impact that architectural spaces open to the outdoors and in connection with nature have on learning and on well-being and the evidence for this. Chapters eleven and twelve implicitly illustrate this concept of ecology in the relationship between architecture and special educational needs. Ligia Solís Salido and María Villanueva Fernández provide valuable examples of typical school furnishings that facilitate concentration for students with ADHD. In addition, the architect Miguel A. Alonso del Val describes the design process followed in the Andrés Muñoz Garde special education centre in Pamplona.

As noted above, methodological and architectural proposals need to go hand in hand to create learning spaces that open their doors to vulnerability, personal development, and the connection with the other or with the task in hand. So, the chapter by Stephen Heppell and Farid Mokhtar Noriega provides a holistic analysis of healthy learning environments. Also, in chapter three, Pablo Campos Calvo-Sotelo and Laura Luceño-Casals consider this when providing an overview of training places for creative specialities in the university (in this case, for degrees in architecture and fashion) while stating how these spaces influence meaningful learning.

The combination of principles and retrospective examination of practical experiences in Rosan Bosch' contribution in chapter two (where she shows how pedagogical principles guide the design of learning spaces in her studio) makes this a good companion for chapter nine, by María Villanueva Fernández and Sonia Lara Ros. Architecture and pedagogy suggest the potential of architecture in the development of creativity in the triad of society–school-classroom through different examples of reference schools in the USA, Finland, and the Netherlands. Similarly, the essentially theoretical chapter by Carmen Urpí Guercia and Clara Eslava Cabanellas is of special value as it reclaims and explains in Spanish the diagrams John Dewey proposed in *Art as Experience* (1934) for organising the school.

As is apparent, the book's structure means the chapters can be read in the order proposed or readers can plot their own course and see the connections between them. The discussion between Ana Costa París and Juan Miguel Otxotorena Elicegui on how educational theories transform how spaces are understood is based on the presentation of a university centre and a school designed by Otxotorena. This chapter also comes relates to the one written as a dialogue between Santiago Atrio and Jaime Úbeda. The authors ask each other questions and answer them, and so the reader finally concludes that there is a need to situate human educability as a guiding vector when generating architectural proposals.

As a systemic reality in which many factors are at play and responsibilities are shared, education ultimately desires the habitation of its spaces. Spaces that have been questioned and transformed as a result of social and cultural changes in recent decades, and which will continue to be questioned and transformed in coming decades. This scenario requires this dialogue and comprehension between educators and architects, beyond the principles given by their respective disciplines. The converging approach this book proposes opens up a broad outlook to other dialogic approaches of this type.

Carmen María Basanta Vázquez ■

Instructions for authors

A. Purpose of the journal

Revista Española de Pedagogía was created in 1943 and its search for excellence has always distinguished itself. It has been the first journal of pedagogical research in Spanish that has been indexed in the most relevant international databases. It accepts only original, high quality submissions from anywhere in the world that help advance pedagogical knowledge, avoid mere opinion polls, and are of general interest. Articles must follow commonly accepted ethical criteria; in particular, in cases of plagiarism and falsification of data, the author will be penalized by the rejection of their submissions. Articles with more than three authors will only be accepted if a reasoned explanation is provided, and in any case, the intellectual collaboration of all the signatories must be certified, not just data collection. It publishes three issues per year.

B. Languages used in the journal

The **REP** is published on the journal's website (revistadepedagogia.org) in Spanish and English. If an article is accepted, an economic agreement will be reached with the authors to implement the procedure that guarantees the use of appropriate academic language in them, with the translation being done by native expert professionals in each of the languages who must translate all the contents of the original article, including tables and graphs.

The texts cited in the article that were originally published in Spanish, even if they were later published in an English translation, must also be included in their original language. In this way, translators will not have to translate these texts again. In particular, it is preferable for a classic text to be cited with both versions: that of its original and that of the printed translation.

C. Requirements of originals

C.1. The publication of research articles must be in accordance with the *Publication Manual of the American Psychological Association* 7th Edition, 2020, (www.apastyle.org). Here are some basic points which must be strictly followed by the authors.

1) The length of the contributions, including all sections, will be between 6000 and 7500 words, using the Times New Roman typeface.

2) Articles should be submitted following the structure and formats indicated in the template that can be found on the journal's website (https://www.revistadepedagogia.org/rep/plantilla_articulo_eng.docx).

3) In cases where authors have compound names or use more than one last name, such as Hispanic authors, they should be connected with a hyphen. Example: María-Teresa Calle-Molina.

4) 6 to 8 keywords should be included.

5) Following the APA model, the References list will be at the end of the article, in alphabetical order by surname, naming all the authors up to a maximum of twenty, with the second line indented.

The translation into English or Spanish should be included in square brackets next to the original title of the publications, since in the Spanish version of the article, the Spanish translations of the titles of the works published in English will be provided. **DOI of publications should be always included whenever possible.**

Some examples are given below:

• **Books:**

Genise, N., Crocamo, L., & Genise, G. (2019). *Manual de psicoterapia y psicopatología de niños y adolescentes [Manual of Psychotherapy and Psychopathology of Children and Adolescents]*. Editorial Akadia.

• **Journal articles:**

Siegel, H. (2002). Philosophy of education and the Deweyan legacy. *Educational Theory, 52* (3), 273-280. https://doi.org/10.1111/j.1741-5446.2002.00273.x

• **Chapters in multiauthor books:**

Mendley, D. M. (2005). The research context and the goals of teacher education. In M. Mohan & R. E. Hull (Eds.), *Teaching Effectiveness* (pp. 42-76). Educational Technology Publications.

• **References to web page:**

Guarino, B. (2019, January 3). How will humanity react to alien life? Psychologists have some predictions. *The Washington Post*. https://www.washingtonpost.com/news/speaking-of-science/wp/2017/12/04/how-will-humanity-react-to-alien-lifepsychologists-have-some-predictions

U.S. Census Bureau. (n.d.). *U.S. and world populatíon dock. U.S*. Department of Commerce. Retrieved July 3, 2019, from https://www.census.gov/popclock/

6) References in the body of the article are written in an abbreviated way that differs from what is used in the reference list. Specifically, if the reference is a direct quotation, the text must be enclosed in quotation marks and, usually at the end, the author's last name, year and page number are placed in parentheses: "(Taylor, 1994, p. 93)". If it is not a direct quotation, and so is not enclosed in quotation marks, the page number will be omitted: (Taylor, 1994). When the author's name is given in the text he/she will not be included in the parenthesis: "According to Taylor (1994, p. 93), culture ..." When an idea is supported by several au-

thors, they will be separated by semicolons: "(Taylor, 1994; Nussbaum, 2012)".

To quote several works by one author, only the years will be added after the author, with letters added if it is necessary to distinguish between publications from the same year: "(Taylor, 1994, 1996a, 1996b)".

When citing works by 3 or more authors, only the first one is cited followed by "*et al*".

Textual quotes will be written in-line if they have fewer than 40 words. If the quotation has 40 words or more, it will be placed in a separate paragraph, without quotation marks, indented by 0.5 cm and in the body text style in a typeface one point smaller. Following the quotation, the author, the year and the page are added in parentheses. The material quoted is reproduced textually, including spelling and punctuation.

Other authors' texts will be quoted following the criterion of consulting the originals that are written in those languages and using their official translation when such text has also been edited in the other language. If this official translation is not available, the quoted text will be offered to the readers translated by the author of the article (noting that the translation belongs to the author of the article), or by the sworn translator hired by the journal.

The use of endnotes will be limited. They must have correlative numbering, using the automatic system in Word and they will be placed after the body of the article and before the References that list everything cited in the text.

7) To highlight a word, italics will be used. Underlining or bold should not be used.

8) The number of lists, diagrams, tables and figures in the text should be limited. These will be called Tables or Figures. In any case, they must be where they should be in the article. In tables, columns should be aligned using tabs (only one tab per column). When quoted in the text (e.g., "as we see in Figure 1 on core subjects"), only the first letter will be capitalized, while at the top of the Table or Figure the whole word will be in small caps, in 12 point capital with Arabic numerals, followed by a point, writing the title in normal text.

The text within the table will be written in the same typeface as the normal text and in 9 point. The source of the table or figure will be placed below it, without a space of separation, stating the Source, colon, surnames, comma and year.

Graphs and tables, in addition to appearing where they should in the article, have to be sent in their original editable format whenever possible. Images should always be sent in high resolution (300 dpi).

9) Equations will be centered, separated from the main text by two lines. They should be referenced in the text, stating the number of the equation; therefore, they will be accompanied by Arabic numerals, aligned to the right and in parentheses in the same line.

10) The article will conclude with a list of the bibliographical references of all the works cited, except for the works cited whose authors include one of the authors of the article. In these cases, these works will be listed in the version with names of the authors, while in the anonymous ones they will not be included in the references, although they will appear in the text, where they will appear as follows: "(Author, 2022, p. 39)". Citation of publications belonging to journals or publishers considered "predatory", i.e., those that lack a rigorous and quality scientific evaluation system (e.g., double-blind peer review) and whose main purpose is not to disseminate knowledge but to obtain an economic profit by charging publication fees to authors. Lists of predatory publishers and journals can be consulted at: https://beallslist.net/

11) Finally, a brief biography of the authors should be included, of a maximum of ten to fifteen lines, which should mention their ORCID and the main aspects of their academic career, current academic situation and the university where they obtained their higher academic degree.

C.2. In addition to research articles, the **Revista Española de Pedagogía** wishes to keep up to date by publishing, in various formats, other works and relevant information in pedagogical science. For this reason, it publishes reviews of books, current news, brief commentaries on educational problems, readers' comments on articles published in the last year, etc. The reviews, always on recent books from relevant publishers, will be between 1200 and 1700 words. They will be headed by the book's details as follows:

Villardón-Gallego, L. (Coord.) (2015). *Competencias genéricas en educación superior [Generic competences in higher education]*. Narcea. 190 pp.

Commentaries will be of moderate length. The analysis of published articles will be sent, from the journal, to the author of the analysed article, so that he/she can prepare a response.

D. Communication with authors and evaluation of originals

The reception of originals is permanently open. Special deadlines may be set for public calls for papers for monographic issues. Special deadlines may be set for public calls for papers for monographic issues.

The assessment process is objective and impartial. To this end, the "double-blind" principle is applied. External reviewers will work in the assessment process to guarantee expert opinions.

The corresponding author will receive an automatic notification confirming receipt of his article. Within three weeks of this notification, the author will receive the results of the first evaluation carried out by the journal's editors. The time frame established for completing the review process is four months, counting from the email of receipt of the article. After this deadline, the author will ordinarily be informed of the final outcome of the assessment. An author whose paper has not been selected may resubmit other papers at a later date.

The publication of articles does not entitle authors to any form of remuneration. All authors are required to use the most effective methods to disseminate their articles, obtain citations and contribute to the advancement of pedagogical knowledge.

E. Publication costs

Once the article has been approved for publication in the **REP**, authors only have to pay for the translation of their article into

Spanish or English, if applicable. ITo ensure the quality of published works, we follow a policy of accepting only professional translations from accredited translators.

Payment for translation is based on the following conditions:

- If the article is supported by a research grant, or similar, the invoice will be paid in full by the body supporting the research.

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Once the papers have been published in the **Revista Española de Pedagogía**, authors can contribute to dissemination tasks, both by supporting the ones that the journal itself carries out and by their own initiative.

The **Revista Española de Pedagogía** has profiles on the main social networks (Facebook, Twitter and LinkedIn), where it disseminates the papers it publishes, consequently we recommend that authors follow the journal on these networks and share their publications.

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To assist in the dissemination of their articles, once approved for publication, authors will be asked to send:

- Two key summary sentences of their article of a maximum of 180 characters for use on social network X.

- A summary of your article of about 90 words for use on Facebook and Linkedin.

- A video of approximately 1 minute in length, in horizontal format, summarizing the main ideas developed in the article for use on our social networks would also be appreciated.

- Our journal is also part of the academic blog Aula Magna 2.0 (http://cuedespyd.hypotheses.org/), where entries on topics of interest for educational research are published periodically, as well as reviews of articles, which contribute to its dissemination. Aula Magna 2.0 publishes an entry dedicated to an article of the REP for each published issue, for which the authors will be asked to provide a longer summary, of between 600 and 1500 words, in a language accessible to the general public and a high-resolution photograph.

Authors are also encouraged to deposit or disseminate accepted articles in:

- Institutional repository of their university and public repositories (SSRN, Zenodo, etc.).

- Google Scholar, ORCID, Dimensions, PlumX, etc.

- Scientific social networks.

- Social networks (Facebook, Twitter, LinkedIn, etc.).

- Personal or institutional website, blog, etc.

It is required that all the bibliographic data of the published work be detailed in these publications.

Databases and bibliographic directories

Social Sciences Citation Index, Scopus, Cabell's International, Catálogo Latindex, Contents Pages in Education, Dialnet, Dulcinea, EBSCO Academic Search Complete, EBSCO Academic Search Elite, EBSCO Academic Search Premier, EBSCO Academic Search Ultimate, EBSCO Education Full Text, EBSCO Education Research Complete, EBSCO Education Source, EBSCO Education Source Ultimate, EBSCO Serials Directory, Educational Research Abstracts Online (ERA), Fuente Académica, Fuente Académica Plus, Fuente Académica Premier, Google Scholar, IBR Online Internationale Bibliographie der Rezensionen geistes- und sozialwissenschaftlicher Literatur, IBZ Online Internationale Bibliographie der geistes- und sozialwissenschaftlichen Zeitschriftenliteratur, IRESIE. Base de datos sobre Educación, JSTOR, Matriz de Información para el Análisis de Revistas (MIAR), MLA International Bibliography, Periodicals Index Online (PIO), Psicodoc, Redined – Red de información educativa, Social SCIsearch, Ulrich's Periodicals Directory.

Classifications and rankings

Journal Citation Reports (JCR), Scimago Journal & Country Rank (SJR), Scopus Sources, Agenzia Nazionale di Valutazione del Sistema Universitario e della Ricerca (ANVUR), Clasificación Integrada de Revistas Científicas (CIRC), Dialnet Métricas, European Reference Index for the Humanities (ERIH).

Library catalogs

Catálogo Colectivo de la Red de Bibliotecas Universitarias Españolas (REBIUN), Catálogo Colectivo de Publicaciones Periódicas (Biblioteca Nacional), Catálogo Colectivo del CSIC, Catálogo de la Biblioteca de Educación (Ministerio de Educación y Formación Profesional), Catalogue Collectif de France (CCFr), Catalogue SUDOC (Francia), Library Hub Discover (Reino Unido), The British Library Current Serials Received, Worldcat (OCLC).

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