Creative Self-Perception of Spanish Secondary Teachers

Isabel Pont-Niclòs
Department of Experimental and Social Sciences Teaching, Faculty of Teacher Training
University of Valencia
Avda. Tarongers, 4, 46022, Valencia, Spain
E-mail address: isabel.pont@uv.es
ORCID: https://orcid.org/0000-0001-5573-4990

Yolanda Echegoyen-Sanz
Department of Experimental and Social Sciences Teaching, Faculty of Teacher Training
University of Valencia
Avda. Tarongers, 4, 46022, Valencia, Spain
E-mail address: yolanda.echegoyen@uv.es
ORCID: https://orcid.org/0000-0002-3729-460X

Antonio Martín-Ezpeleta
Department of Language and Literature Teaching, Faculty of Teacher Training
University of Valencia
Avda. Tarongers, 4, 46022, Valencia, Spain
E-mail address: anmarez@uv.es
ORCID: https://orcid.org/0000-0003-0210-3399

ABSTRACT

Aim. The aim of this research is to analyse the creative self-perception of Spanish secondary teachers in different domains considering that creativity is increasingly being considered a key educational objective by organisations such as the Organisation for Economic Co-operation and Development (OECD) or educational laws, such as the recent Spanish one (Ministerio de Educación, Formación Profesional y Deportes Español, 2020).

Methods. Participants were 100 Spanish in-service teachers at the level of secondary education. They completed the K-DOCS questionnaire (Kaufman, 2012), in which the self-perception of creativity in different domains (Self/Everyday, Scholarly, Performance, Scientific/Mechanic and Artistic) is assessed. The influence of variables such as gender, age, years of experience and area of teaching are analysed.

Results. The analysis shows that Spanish secondary teachers have moderate-to-high perception of their own creativity. Although no statistically significant differences were

found according to age or years of expertise, the scores in the Scientific/Mechanic domain were found to be significantly different according to gender. Separate creativity profiles were found for teachers with unrelated areas of expertise.

Conclusion. This study aims to enhance understanding into the role of teachers in the promotion/hindering of creativity in classrooms. Results show a moderate creative self-perception with differences across domains, which logically conditions their conceptualisation of creativity and the importance given to it in classrooms. The importance of teacher training contributing to improve it is valued and key aspects are pointed out, such as the relevance of promoting a Centre Creative Plan with specific actions of a transdisciplinary nature in schools.
Keywords: creativity, 21st century skills, teachers, secondary education, self-perception

Introduction

Creativity leads to learning outcomes that meet many concerns of current society (Glaveanu et al., 2019). Indeed, since the pioneer studies of Joy Paul Guilford (1950), promoting the creativity of students has long been viewed as an appropriate way to prepare students for an uncertain future. In fact, creativity is considered one of the 21st century skills (Thornhill-Miller et al., 2023), as the OECD has been highlighting for years. This is also apparent from the recent addition of a creativity assessment to the latest PISA tests (OECD, 2022). However, prior to discussing how education may shape creativity, it is important to consider how creativity is conceptualised, especially by teachers, since they are mostly responsible to opening spaces for creativity in the classroom.

The fact is that despite no existing standard definition, creativity is regarded as a two-fold concept combining novelty and usefulness (Runco & Jaeger, 2012; Walia, 2019). In any case, it must be taken into account that what is considered original or appropriate may differ from one sociocultural context to another (Plucker et al., 2004). In addition, creativity researchers nowadays tend to understand creativity as a multi-domain construct (Hass et al., 2017), as the Amusement Park Theory established by John Baer and James C. Kaufman (2005) states. This theory considers that creativity includes both general and specific domains, and proposes a hierarchical structure for the creative process, ranging from basic cognition, motivational and environmental requirements, to specific domains and microdomains related to particular tasks, such as writing poetry or solving a particular problem. Nevertheless, how many and which domains are included is still a topic of discussion among creativity researchers, since models fail at stablishing well-defined thresholds for each domain, or whether any truly exist (Baer, 2010).

Numerous studies concentrate on distinct domains of creativity. Consequently, scientific creativity has been explored through specific scientific productions or prob-

lem-solving patterns (Chen et al., 2016; de Vries & Lubart, 2019; Hu et al., 2010). Linguistic creativity has been measured as the generation of metaphors, since they are regarded as a clear display of creative thinking (Bergs, 2019; Bowdle & Gentner, 2005). Additional domains, such as music, art, or mathematics, are also analysed in several studies (Erbas & Bas, 2015; Kladder & Lee, 2019; Mansour, 2018). However, in recent years, there has been considerable interest in comparing different domains of creativity. Also, their relationship with a general creativity construct has been addressed. Sometimes general creativity is wrongly exclusively associated to divergent thinking tests (Baer, 2015), and this is believed to result in contradictory findings (Kaufman et al., 2017).

Consequently, efforts have been made to adopt a more integrative approach, evaluating multiple domains of creativity through refined analytical designs. In this context, researchers apply different approaches to form focal points to assess such a broad concept, although existing little consensus in the field as to how to suitably measure creativity (Long et al., 2022). For instance, Mel Rhodes (1961) stablished the 4P model (person, process, product, and press) as a framework to analyse creativity from discrete perspectives. Then, Vlad Petre Glaveanu (2013), transmuted the 4P model into the 5A classification (actor, action, artifact, audience, and affordance). Regardless, the most widespread scheme to address creativity is known as the 4C: Big-C, as a genius-level creativity; Pro-C, as outstanding innovations which may yield to reach genius expressions; little-c, referred to individual creativity achievements such as meaningful insights or interpretations experienced at a learning process; and mini-c, related to everyday activities approached creatively (Kaufman & Glaveanu, 2021).

This scaffolding of creativity allows identification of relevant aspects to promote the development of creativity from one *c* to the upper one. While feedback is considered the vehicle to evolve from mini-c to Little-c, deliberate practice is essential for achieving creative outcomes not only in everyday life, but also at professional or academic level. Hence, opportunities to develop creativity should be provided within the classroom (Beghetto & Kaufman, 2014). In this regard there are a multitude of techniques to assess the level of creativity of both teachers and students such as self-report questionnaires (Carson et al., 2005), divergent thinking tests (Kim, 2006) or personality tests (Costa & McCrae, 1992). In addition to these, there are more specific assessments centred a in concrete creative domain, such as arts or science (Lemons, 2011; Said-Metwaly et al., 2017), which are designed in diverse settings (Acar & Runco, 2019; Cotter & Silvia, 2019; Karwowski et al., 2019; Snyder et al., 2019). The results reported by those assessments generally point out to a multidimensional nature of creativity.

Therefore, teachers need to understand that and reinforce the relationships between learning and creativity processes on different domains (Thornhill-Miller et al., 2023). There are several factors influencing the development of creative potential at schools, from individual experiences, prior knowledge and personal preferences to environmen-

tal conditions (Beghetto & Kaufman, 2014; Glaveanu et al., 2019). However, among all these factors researchers are prone to consider that teachers have a remarkable influence in the promotion or hampering of students' creativity (Bereczki & Karpati, 2018). Different authors (Chan & Yuen, 2014; Yates & Twigg, 2017) even affirm that teachers must cultivate their own creativity beforehand to foster students' creativity. That is why it is important to study different aspects related to teachers' creativity, and self-report assessments are widely used (Barbot et al., 2019; Cotter & Silvia, 2019). This methodology is thought to capture aspects of creativity profile, motivation and expertise, related to day-to-day creativity endeavours and teaching practices (Kaufman, 2019).

There are various self-reported questionnaires to assess creativity in different domains, such as the Creative Behaviour Inventory (Hocevar, 1979), the Creative Achievement Questionnaire (CAQ) (Carson et al., 2005), Biographical Inventory of Creative Behaviour (BICB) (Batey, 2007), or the Creative Actions Scale (CAS) (Elisondo, 2021). One of the most used is the Kaufman Domains of Creativity Scales (K-DOCS) (Kaufman, 2012), based on the APT mentioned above. It encompasses both general and specific domain conceptions of creativity, tapping into 5 large creativity areas (Everyday, Scholarly, Performance, Scientific/Mechanic, and Artistic). It has been extensively used to target different populations (Awofala & Fatade, 2015; McKay et al., 2017; Seng et al., 2016), demonstrating that it is a reliable and valid instrument for evaluating self-perceived creativity in diverse contexts, such as education or the workplace. It has been translated into various languages, such as Czech (Plháková et al., 2015), Chinese (Tu & Fan, 2015), Turkish (Kandemir & Kaufman, 2019), German (Brauer et al., 2022) and Spanish (Echegoyen-Sanz & Martín-Ezpeleta, 2021, Elisondo et al., 2022).

In Spain, the recent National Educational Law (LOMLOE, 2020) is in line with the OECD vision and states that "[…] artistic creation, audiovisual communication, digital competence, the promotion of creativity and the scientific spirit will be worked on in all areas […]" (p. 122873). In this context, it is appropriate to assess the creative self-perception of Spanish in-service teachers, since this population is not as studied as that of pre-service teachers (Echegoyen-Sanz & Martín-Ezpeleta, 2021; Martín-Ezpeleta et al., 2022; Martín-Ezpeleta et al., 2024; Pont-Niclòs et al., 2022).

Objectives

In the light of all the above this study seeks to analyse the creative self-perception of secondary school teachers in Spain, due to its remarkable influence on their teaching style and also as a first step to design formative programmes to promote creativity in classrooms. In addition, the influence of gender, age, years of expertise and area of teaching are likewise analysed. Therefore, the research questions nourishing this work are the following:

- What is the creative self-perception of Spanish secondary school teachers in different domains?
- Are there any significant differences depending on gender or age of teachers?
- Are those self-perceptions influenced by years of expertise and/or area of teaching?

Methodology

Participants consisted of Spanish secondary school teachers affiliated to eight different educational centres and practicing at the time of the study. Data reported was collected during the academic year 2021-2022 and it corresponds to a total of 100 teachers specialised in different areas: Arts (N=3), Language and Literature (N=38), Mathematics and Technology (N=18), Music (N=6), Natural Sciences (N=12), Physical Education (N=6) and Social Sciences (N=17). Those areas were regrouped into two main large knowledge areas (Experimental and Social Sciences: N = 47; Humanities: N = 53). Age of teachers ranged from 25 up to 60 years old, with a mean value of 45.43 years, and a standard deviation of 9.43. In order to get insight into the influence of age on self-perception of creativity, two age groups ages were established, based on the mean value obtained: below or equal to 45 years old (N = 47) and more or equal to 46 years old (N = 53). Similarly, different groups were defined considering their years of expertise in teaching: below or equal to 15 years old (N = 46) and more or equal to 16 years old (N = 54). The global sample displays homogeneity of gender distribution: 48% of participants were female and 52% were male. Regarding ethical considerations, the procedures stablished by the Ethics Committee of the University of Valencia were strictly followed. Hence, all teachers received information about the scope of the research, the anonymisation protocol and signed an informed consent form in order to participate in the study.

As mentioned before, the self-perception of creativity was assessed using the K-DOCS (Kaufman, 2012). The questionnaire includes 50 items related to 5 different creativity domains: Everyday, 11 items; Scholarly, 11 items; Performance, 10 items; Scientific/Mechanic, 9 items; and Artistic, 9 items. Participants were asked to compare themselves with pairs -with similar age and life experiences- and then evaluate themselves in particular tasks, for instance "writing a poem" (Performance), "writing a computer programme" (Scientific/Mechanic), "writing a letter to the editor" (Scholarly), "teaching someone how to do something" (Everyday) and "appreciating a beautiful painting" (Artistic). They indicated the degree to which they develop the tasks creatively, in comparison with their pairs, using a 5-point Likert scale as follows: much less creative (1), less creative (2), neither more nor less creative (3), more creative (4) or much more creative (5).

The validity of the Spanish translation, analysed by the Cronbach's Alpha method (Elisondo et al., 2022; Echegoyen-Sanz & Martin-Ezpeleta, 2021), was confirmed with alpha values above .76 for all domains. The data collection was carried out using an online

version of the questionnaire, in order to facilitate the participation of the teachers, and all the demographic data was compiled simultaneously.

The statistical analysis was carried out using SPSS software (version 26). Specifically, the mean and standard deviation was calculated for each dimension of the questionnaire. The normality distribution of the data was checked using the Kolmogorov-Smirnov test. In order to elucidate the existence of significant differences between genders, age groups, years of expertise and areas of teaching, either the t-Student or the Mann Whitney U tests were applied, for normal and non-normal distributions, respectively. In all cases the significance level was .05. Effect sizes were calculated using Hedges's g or the formula for non-parametric data described by Andy Field (2018). The magnitude of effect sizes was evaluated according to Jacob Cohen's classification for behavioural sciences (1988).

Results and Discussion

The creative self-perceptions of Spanish secondary school teachers are shown in Table 1, corresponding to the scores of the different dimensions in the K-DOCS questionnaire (Kaufman, 2012). As can be observed, secondary teachers exhibit moderate to high levels of self-perceived creativity across various domains. Particularly, the highest scores have been found at the Self/Everyday domain followed by Artistic and Scholarly domains. However, Performance and Scientific/Mechanic domains have lower creativity self-perception profiles, being the latter the one with the lowest values among Spanish secondary teachers. These results are analogous to previously reported studies for Spanish primary pre-service teachers (Pont-Niclòs et al., 2022) and for a multi-background sample of Spanish people (Elisondo et al., 2022). Further, similar tendencies have been found for undergraduate students, either from Turkey (Kandemir & Kaufman, 2019) or US (Lee & Portillo, 2022), as well as for a general sample of German population (Brauer, 2022).

Table 1

Descriptive statistics corresponding to the different creativity domains

Creativity domain	Min.	Max.	Mean	Standard deviation
Self/Everyday$^{\phi}$	1.73	5.00	3.88	.70
Scholarly	1.92	5.00	3.66	.68
Performance	1.00	4.80	2.87	.92
Scientific/Mechanic	1.00	5.00	2.51	1.06
Artistic	1.78	4.89	3.14	.72

Note. N = 100 (total sample size); ϕ: Non-normally distributed variable
Source. Own research.

When analysing gender differences on the creative self-perception of secondary teachers, female and male teachers score slightly differently at the assessed domains.

As shown in Table 2, female teachers achieved higher scores in the Performance and Artistic domains. Conversely, males ranked higher at Self/Everyday, Scholarly and Scientific/Mechanic domains. Nevertheless, statistically significant differences by gender were only observed in the Scientific/Mechanic domain (with a large size effect), according to the results of Mann-Whitney U test (non-normally distributed variables) and Student's t test (normally distributed variables). Similar findings were reported in previous studies in which males rated themselves higher on Scientific-related domains, while women scored higher on Artistic domains (Elisondo et al., 2022; Kaufman, 2006; Kaufman et al., 2009; Pont-Niclòs, 2022). However, some studies have questioned these findings given the general tendency of females to underestimate their own abilities (Furnham, 2001; Kaufman, 2019).

Table 2

Differences on the creative self-perception of secondary teachers according to gender

Creativity domain	Gender	Mean	Standard deviation	z	p	g
*Self/Everyday*ϕ	Female	3.85	.67	-.570	.568	-
	Male	3.91	.73			
Scholarly	Female	3.63	.65	-0.324	0.747	-
	Male	3.68	.71			
Performance	Female	2.92	1.05	0.583	0.561	-
	Male	2.81	.79			
Scientific/Mechanic	Female	2.21	.87	-2.856	0.005**	0.57
	Male	2.79	1.15			
Artistic	Female	3.21	.74	0.848	0.398	-
	Male	3.09	.70			

Note. N (female) = 48; N (male) = 52; ϕ: Non-normally distributed variable; **There are statistically significant differences at the .01 level.

Source. Own research.

When considering the influence of age or years of expertise in teaching (Tables 3 and 4) in the creative self-perception of secondary teachers, similar mean values are obtained for both groups studied. Further statistical analysis demonstrates that there are not significant differences between groups of teachers, which is in line with previous studies suggesting that experience and age of teachers have no effect on their perception of creative characteristics (Kettler et al., 2018). These results may point out the general statical character of teachers' professional development. It is considered that there is a lack of formation, support and training programmes promoting the integration of creativity at the Education System. Therefore, more efforts are needed on teacher formation, curriculum design and educational programmes, directly addressed to not only enhance the creativity competences of teachers and students, but also to shed light into its relevance at the current educational and social paradigm (Harris & De Bruin, 2018; Hernández-Torrano & Ibrayeva, 2020; Vincent-Lancrin et al., 2019).

Table 3

Differences on the self-perception of creativity of secondary school teachers according to age

Creativity domain	Age (years)	Mean	Standard deviation	t/z	p	g
Self/Everyday$^{\phi}$	≤ 45	3.88	.68	.166	.868	-
	≥ 46	3.89	.73			
Scholarly	≤ 45	3.61	.61	.672	.853	-
	≥ 46	3.70	.73			
Performance	≤ 45	2.83	.91	.338	.645	-
	≥ 46	2.89	.93			
Scientific/Mechanic	≤ 45	2.44	1.10	.560	.327	-
	≥ 46	2.57	1.10			
Artistic	≤ 45	3.10	.70	.679	.868	-
	≥ 46	3.19	.75			

Note. N (age ≤ 45 years old) = 47; N (age ≥46) = 53; ϕ: Non-normally distributed variable.

Source. Own research.

Table 4

Differences on the self-perception of creativity of secondary school teachers according to years of experience

Creativity domain	Years of Experience	Mean	Standard deviation	t/z	p	g
Self/Everyday$^{\phi}$	≤ 15	3.91	.71	.391	.695	-
	≥ 16	3.94	.82			
Scholarly	≤ 15	3.63	.66	.966	.760	-
	≥ 16	3.64	.64			
Performance	≤ 15	2.88	.93	.668	.929	-
	≥ 16	2.72	.89			
Scientific/Mechanic	≤ 15	2.40	.98	.465	.334	-
	≥ 16	2.03	.75			
Artistic	≤ 15	3.10	.72	.819	.564	-
	≥ 16	3.29	.75			

Note. N (years of experience ≤ 15 years old) = 46; N (years of experience ≥ 16) = 54; ϕ: Non-normally distributed variable.

Source. Own research.

Further inspection of the creative self-perception according to the area of expertise of the teachers reveals that Arts and Physical Education secondary school teachers are prone to have higher self-perception of their creativity (Table 5). In addition, while Natural Sciences and Maths and Technology teachers display similar creative self-perception profiles, Social Sciences, Music and Language and Literature teachers display a different one. As it can be observed at Table 5, this is mainly related to their perception of creativity in the Scientific/Mechanic (higher for the former stated areas of expertise) and Performance dimensions (higher for the latter).

Table 5

Descriptive statistics corresponding to creative self-perception of secondary teachers according to area of expertise

Creativity domain	Area of expertise	Mean	Standard deviation
Self/Everyday[ϕ]	Natural Sciences	3.62	.62
	Maths and Technology	4.03	.60
	Social Sciences	4.09	.70
	Language and Literature	3.71	.71
	Music	3.82	.73
	Arts	4.33	.63
	Physical Education	4.31	.81
Scholarly	Natural Sciences	3.49	.74
	Maths and Technology	3.54	.69
	Social Sciences	3.86	.67
	Language and Literature	3.62	.62
	Music	3.35	.58
	Arts	3.78	.63
	Physical Education	4.21	.81
Performance	Natural Sciences	2.32	.79
	Maths and Technology	2.54	.83
	Social Sciences	2.6	1.02
	Language and Literature	3.07	.86
	Music	3.60	.61
	Arts	2.80	.72
	Physical Education	3.52	.83
Scientific/Mechanic	Natural Sciences	2.83	.77
	Maths and Technology	3.64	.98
	Social Sciences	2.32	1.02
	Language and Literature	1.91	.72
	Music	2.19	.67
	Arts	2.81	.36
	Physical Education	3.02	1.31
Artistic	Natural Sciences	3.04	.62
	Maths and Technology	3.05	.61
	Social Sciences	3.29	.76
	Language and Literature	2.98	.66
	Music	3.22	.83
	Arts	4.85	.06
	Physical Education	3.37	.60

Note. N (Natural Sciences) = 12; N (Maths and Technology) = 18; N (Social Sciences) = 17; N (Language and Literature) = 38; N (Music) = 6; N (Arts) = 3; N (Physical Education) = 6.

Source. Own research.

Aiming to shed light into whether those tendencies were statistically significant, areas of expertise were classified into two large groups (Experimental and Social Sciences: Natural Sciences, Maths and Technology and Social Sciences; and Humanities: Language and Literature, Music, Arts and Physical Education), aiming to achieve a homogeneous distribution of the sample (Table 6). Regarding the Performance domain, statistically significant differences, with a large size effect, have been identified between Experimental and Social Sciences and Humanities teachers (p = <.001; g = .73). It must be highlighted that in this domain, the creative self-perception of Experimental and Social Sciences teachers is low (M = 2.53; SD = .89). These results may indicate a robust correlation between the background of teachers and their perceptions about creativity and innovation at different fields of education. This fact may be associated with the influence of self-efficacy perceptions within a specific subject area or area of knowledge and the teaching experiences/collaborations (Perera et al., 2019; Ozder, 2011). Accordingly, statistically significant differences have been also identified for the Scientific/Mechanic domain between Experimental and Social Sciences and Humanities teachers (p = <.001; g = .85) with a large size effect, being the former who show higher creative self-perception within this domain.

Table 6

Differences on the self-perception of creativity of secondary teachers according to area of expertise

Creativity domain	Area of expertise	Mean	Standard deviation	F/z	p	g
Self/Everyday$^{\phi}$	Experimental and Social Sciences	3.95	.65	0.716	.474	-
	Humanities	3.83	.74			
Scholarly	Experimental and Social Sciences	3.64	.70	.156	.877	-
	Humanities	3.67	.66			
Performance	Experimental and Social Sciences	2.53	.89	3.675	<.001***	.73
	Humanities	3.16	.84			
Scientific/Mechanic	Experimental and Social Sciences	2.96	1.11	4.292	<.001***	.85
	Humanities	2.11	.86			
Artistic	Experimental and Social Sciences	3.13	.67	.156	.876	-
	Humanities	3.16	.78			

*Note. N (Experimental and Social Sciences) = 47; N (Humanities) = 53; ϕ: Non-normally distributed variable; ***There are statistically significant differences at the .001 level.*

Source. Own research.

Conclusion

This study examines the creative self-perception of secondary school teachers at five different domains (Self/Everyday, Scholarly, Performance, Scientific/Mechanic and Artistic), revealing moderate-to-high scores for all of them. The throughout analysis of the data showed that gender differences were statistically significant, only for the Scientific/Mechanic domain. This fact may be interpreted by using traditional stereotypes, which commonly associate rather higher creative self-perceptions on the Scientific/Mechanic domain for males (Elisondo et al., 2022; Kaufman, 2006), although gender differences in creativity research are not fully comprehended (Caballero-Garcia and Sánchez-Ruíz, 2020). Regarding the influence of age and years of expertise of secondary school teachers on the creative self-perception, the data analysis showed no statistically significant differences. Hence, designing of training programmes for secondary teachers are essential given the current educational paradigm (Cotter et al., 2022). Those programmes should include practical tools to design teaching interventions with creativity at the core of teaching and learning processes, as well as theoretical information about the creativity construct and its assessment (Kaplan, 2019). Finally, the obtained results also highlight the dependency of the area of expertise and the creative self-perceptions of secondary teachers, which may be associated with self-efficacy and emotional/engagement processes (Elisondo et al., 2022; Perera et al., 2018).

Undoubtedly, further research is needed in this field, which would broaden the scope of this study. On the one hand, the factorial analysis of the K-DOCS questionnaire is currently being tested by different research groups to elucidate the most appropriate model (five or nine domains) to interpret data (Kapoor et al., 2021). On the other hand, a combination of self-reported questionnaires and objective creativity assessments may provide insights into the relationship of perceptions and actual creative abilities (Kaufman, 2019; Taylor & Kaufman, 2020). In addition, the sample, although sufficient, it is not representative of the entire Spanish secondary teachers' population. Moreover, it could be expanded to include different educational levels such as early childhood or primary education, and be more delocalised.

In any case, the present study contributes to provide further insights into the role of teachers in the promotion/hindering of creativity in the classrooms. Prior to encouraging students to be creative, teachers need to understand and recognise the importance of creativity and provide learning opportunities leading to the emulation of creative behaviour (Soh, 2017), such as technology-based creative activities (Bereczki & Kárpáti, 2021). There is the requirement of teachers intensifying a process of scientific conceptualisation of creativity, which has been defined as one of the key competences of the 21st century. Research studies as the one here presented are, therefore, necessary to know in-service teachers, before addressing a continuous training on creativity, which in the Spanish case is urgent with the new legislative changes of the LOMLOE, clearly aligned with the OECD.

Moreover, all this would be a starting point to develop programmes and support guidelines for teachers to cope with the renovated paradigm established by the demands of the current society (Anderson et al., 2022). This needs a reflection starting from the assessment of the current situation to, in a second stage, implement measures such as a Centre Creative Plan in the school, grouping actions in favour of creativity in the classrooms. This plan entails not only considering actions for each domain and disciplinary area, but especially those of a transdisciplinary nature. The latter could be exhibitions of inventions and art (the more heterogeneous the better) or conferences of creative people in different specialities (architects, advertisers, etc.). Perhaps this will ensure that creativity stops being a topic only for artists and becomes a topic for all citizens.

Acknowledgements

Authors would like to thank the financial support of project CIAICO/2022/228 funded by Generalitat Valenciana (Consellería de Innovación, Universidades y Empleo) and Grant PID2021-124333NB-I00 funded by MCIN/AEI/ 10.13039/501100011033 and by ERDF A way of making Europe.

References

Acar, S. & Runco, M. A. (2019). Divergent thinking: New methods, recent research, and extended theory. *Psychology of Aesthetics, Creativity, and the Arts, 13*(2), 153-158. https://doi.org/10.1037/aca0000231

Anderson, R. C. Katz-Buonincontro, J., Livie, M., Land, J., Beard, N., Bousselot, T., & Schuhe, G. (2022). Reinvigorating the desire to teach: Teacher professional development for creativity, agency, stress reduction, and wellbeing. *Frontiers in Education, 7*, 848005. https://doi.org/10.3389/feduc.2022.848005

Awofala, A. O. A. & Fatade, A. O. (2015). Validation of the domains of creativity scale for Nigerian preservice science, technology, and mathematics teachers. *Electronic Journal of Research in Educational Psychology, 13*(1), 131-150. http://dx.doi.org/10.14204/ejrep.35.14057

Baer, J. (2010). Is creativity domain specific? In Kaufman & Stenberg (Eds.), *Cambridge Handbook of Creativity* (pp. 321-341). Cambridge University Press.

Baer, J. (2015). The Importance of Domain-Specific Expertise in Creativity. *Roeper Review, 37*(3), 165-178. https://doi.org/10.1080/02783193.2015.1047480

Baer, J. & Kaufman, J. C. (2005). Bridging generality and specificity: The Amusement Park Theoretical (APT) model of creativity. *Roeper Review, 27*(3), 158-163. https://doi.org/10.1080/02783190509554310

Barbot, B., Hass, R. W., & Reiter-Palmon, R. (2019). Creativity assessment in psychological research: (Re) setting the standards. *Psychology of Aesthetics, Creativity, and the Arts, 13*(2), 233-240. http://dx.doi.org/10.1037/aca0000233

Batey, M. (2007). *A psychometric investigation of everyday creativity* [Unpublished doctoral dissertation]. University College of London.

Beghetto, R. A. & Kaufman, J. C. (2014). Classroom contexts for creativity. *High ability studies, 25*(1), 53-69. https://doi.org/10.1080/13598139.2014.905247

Bereczki, E. O. & Karpati, A. (2018). Teachers' beliefs about creativity and its nurture: A systematic review of the recent research literature. *Educational Research Review, 23*, 25-56. https://doi.org/10.1016/j.edurev.2017.10.003

Bereczki, E. O. & Kárpáti, A. (2021). Technology-enhanced creativity: A multiple case study of digital technology-integration expert teachers' beliefs and practices. *Thinking Skills and Creativity, 39*, 100791. https://doi.org/10.1016/j.tsc.2021.100791

Bergs, A. (2019). What, if anything, is linguistic creativity? *Gestalt Theory, 41*(2), 173-183. https://doi.org/10.2478/gth-2019-0017

Bowdle, B. F. & Gentner, D. (2005). The career of metaphor. *Psychological Review, 112*(1), 193-216. https://doi.org/10.1037/0033-295X.112.1.193

Brauer, K., Sendatzki, R., Kaufman, J. C., & Proyer, R. T. (2022). Counting the Muses in German speakers — Evaluation of the German-language translation of the Kaufman Domains of Creativity Scales (K-DOCS). *Psychological Test Adaptation and Development*, *3*(1), 70-84. https://doi.org/10.1027/2698-1866/a000024

Caballero-García, P. A. & Sanchez-Ruíz, S. (2021). Creativity and life satisfaction in Spanish university students. Effects of an emotionally positive and creative program. *Frontiers in Psychology*, *12*, 746154. https://doi.org/10.3389/fpsyg.2021.746154

Carson, S., Peterson, J., & Higgins, D. (2005). Reliability, validity, and factor structure of the creative achievement questionnaire. *Creativity Research Journal, 17*, 37–50. https://doi.org/10.1207/s15326934crj1701_4

Chan, S. & Yuen, M. (2014). Personal and Environmental Factors Affecting Teachers' Creativity-Fostering Practices in Hong Kong. *Thinking Skills and Creativity, 12*, 69-77. https://doi.org/10.1016/j.tsc.2014.02.003

Chen, B., Hu, W., & Plucker, J. A. (2016). The effect of mood on problem finding in scientific creativity. *The Journal of Creative Behavior, 50*(4), 308-320. https://doi.org/10.1002/jocb.79

Cohen, J. (1988). *Statistical Power Analysis for Behavioral Sciences* (2nd ed.). Erlbaum.

Costa, P. T. & McCrae, R. R. (1992). Four ways five factors are basic. *Personality and Individual Differences, 13*(6), 653-665. https://doi.org/10.1016/0191-8869(92)90236-I

Cotter, K. N. & Silvia, P. J. (2019). Ecological assessment in research on aesthetics, creativity, and the arts: Basic concepts, common questions, and gentle warnings. *Psychology of Aesthetics, Creativity, and the Arts, 13*(2), 211-217. https://doi.org/10.1037/aca0000218

Cotter, K. N., Beghetto, R. A., & Kaufman, J. C. (2022). Creativity in the Classroom: Advice for Best Practices. In T. Lubart, M. Botella, S. Bourgeois-Bougrine, X. Caroff, J. Guegan, C. Mouchiroud, J. Nelson & F. Zenasni (Eds.). *Homo Creativus: The 7 C's of Human Creativity* (pp. 249-264). Springer.

De Vries, H. B., & Lubart, T. I. (2019). Scientific creativity: divergent and convergent thinking and the impact of culture. *The Journal of Creative Behavior, 53*(2), 145-155. https://doi.org/10.1002/jocb.184

Echegoyen-Sanz, Y. & Martín-Ezpeleta, A. L. (2021). Creatividad y ecofeminismo en la formación de maestros: Análisis cualitativo de cuentos digitales [Creativity and ecofeminism in teacher training: Qualitative analysis of digital stories]. *Profesorado: Revista de Currículum y Formación del Profesorado, 25*(1), 23-44. https://doi.org/10.30827/profesorado.v25i1.15290

Elisondo, R. C. (2021). Creative Actions Scale: A Spanish scale of creativity in different domains. *The Journal of Creative Behavior, 55*(1), 215-227. https://doi.org/10.1002/jocb.447

Elisondo, R. C., Soroa, G., & Flores, B. (2022). Leisure activities, creative actions and emotional creativity. *Thinking Skills and Creativity, 45*, 101060. https://doi.org/10.1016/j.tsc.2022.101060

Erbas, A. K. & Bas, S. (2015). The contribution of personality traits, motivation, academic risk-taking and metacognition to the creative ability in mathematics. *Creativity Research Journal, 27*(4), 299-307. https://doi.org/10.1080/10400419.2015.1087235

Field, A. (2018). *Discovering statistic using SPPS*. Sage

Furnham, A. (2001). Self-estimates of intelligence: Culture and gender difference in self and other estimates of both general (g) and multiple intelligences. *Personality and Individual Differences, 31*(8), 1381-1405. https://doi.org/10.1016/S0191-8869(00)00232-4

Glaveanu, V. P. (2013). Rewriting the language of creativity: The Five A's framework. *Review of General Psychology, 17*(1), 69-81. https://doi.org/10.1037/a0029528

Glaveanu, V. P., Hanchett Hanson, M., Baer, J., Barbot, B., Clapp, E. P., Corazza, G. E., Hennessey, B., Kaufman, J. C., Lebuda, I., Lubart, T., Montuori, A., Ness, I. J., Plucker, J., Reiter-Palmon, R., Sierra, Z., Simonton, D. K., Neves-Pereira, M. S., & Sternberg, R. J. (2019). Advancing creativity theory and research: A socio-cultural manifesto. *The Journal of Creative Behavior, 54*(3), 741-745. https://doi.org/10.1002/jocb.395

Guilford, J. P. (1950). Creativity. *American Psychologist, 5,* 444–454.

Harris, A. & De Bruin, L. R. (2018). Secondary school creativity, teacher practice and STEAM education: An international study. *Journal of Educational Change, 19*, 153-179. https://doi.org/10.1007/s10833-017-9311-2

Hass, R. W., Reiter-Palmon, R., & Katz-Buonincontro, J. (2017). Are implicit theories of creativity domain specific? Evidence and implications. In M. Karwowski and J. C. Kaufman (Eds.), *The creative self: Effect of beliefs, self-efficacy, mindset, and identity* (pp. 219-234). Elsevier Academic Press.

Hernández-Torrano, D. & Ibrayeva, L. (2020). Creativity and education: A bibliometric mapping of the research literature (1975–2019). *Thinking Skills and Creativity*, *35*, 100625. https://doi.org/10.1016/j.tsc.2019.100625

Hocevar, D. (1979). *The development of the Creative Behavior Inventory*. Annual Meeting of the Rocky Mountain Psychological Association. https://files.eric.ed.gov/fulltext/ED170350.pdf

Hu, W., Shi, Q. Z., Han, Q., Wang, X., & Adey, P. (2010). Creative Scientific Problem Finding and Its Developmental Trend. *Creativity Research Journal, 22*(1), 46-52. https://doi.org/10.1080/10400410903579551

Kandemir, M. A. & Kaufman, J. C. (2019). The Kaufman domains of creativity scale: Turkish validation and relationship to academic major. *The Journal of Creative Behavior, 54*(4), 1-11. https://doi.org/10.1002/jocb.428

Kaplan, D. E. (2019). Creativity in education: Teaching for creativity development. *Psychology, 10*(2), 140-147. https://doi.org/10.4236/psych.2019.102012

Kapoor, H., Reiter-Palmon, R., & Kaufman, J. C. (2021). Norming the muses: Establishing the psychometric properties of the Kaufman Domains of Creativity Scale. *Journal of Psychoeducational Assessment, 39*(6), 680-693. https://doi.org/10.1177/07342829211008334

Karwowski, M., Han, M. H., & Beghetto, R. A. (2019). Toward dynamizing the measurement of creative confidence beliefs. *Psychology of Aesthetics, Creativity, and the Arts, 13*(2), 193–202. https://doi.org/10.1037/aca0000229

Kaufman, J. C. (2006). Self-reported differences in creativity by ethnicity and gender. *Applied Cognitive Psychology, 20*(8), 1065-1082. https://doi.org/10.1002/acp.1255

Kaufman J. C., Waterstreet M. A., Ailabouni H. S., Whitcomb H. J., Roe A. K., & Riggs M. (2009). Personality and self-perceptions of creativity across domains. *Imagination, Cognition and Personality, 29*(3), 193-209. https://doi.org/10.2190/IC.29.3.c

Kaufman, J. C. (2012). Counting the muses: development of the Kaufman Domains of Creativity Scale (K-DOCS). *Psychology of Aesthetics, Creativity, and the Arts, 6*(4), 298-308. https://doi.org/10.1037/a0029751

Kaufman, J. C. (2019). Self-assessments of creativity: Not ideal, but better than you think. *Psychology of Aesthetics, Creativity, and the Arts, 13*(2), 187–192. http://dx.doi.org/10.1037/aca0000217

Kaufman, J. C. & Glaveanu, V. P. (2021). An overview of creativity theories. In J. C. Kaufman & R. J. Sternberg (Eds.). *Creativity: An Introduction* (pp. 17-30). Cambridge University Press.

Kaufman, J. C., Glaveanu, V. P., & Baer, J. (2017). *The Cambridge Handbook of Creativity Across Domains*. Cambridge University Press.

Kettler, T., Lamb, K. N., Willerson, A., & Mullet, D. R. (2018). Teachers' perceptions of creativity in the classroom. *Creativity Research Journal, 30*(2), 164-171. https://doi.org/10.1080/10400419.2018.1446503

Kim, K. H. (2006). Can we trust creativity tests? A review of the Torrance Tests of Creative Thinking (TTCT). *Creativity Research Journal, 18*(1), 3-14. https://doi.org/10.1207/s15326934crj1801_2

Kladder, J. & Lee, W. (2019). Music teachers' perceptions of creativity: A preliminary investigation. *Creativity Research Journal, 31*(4), 395-407. https://doi.org/10.1080/10400419.2019.1651189

Lee, J. H. & Portillo, M. (2022). Transferability of creative self-belief across domains: The differential effects of a creativity course for university students. *Thinking Skills and Creativity, 43*, 100996. https://doi.org/10.1016/j.tsc.2021.100996

Lemons, G. (2011). Diverse perspectives of creativity testing: Controversial issues when used for inclusion into gifted programs. *Journal for the Education of the Gifted, 34*(5), 742-772. https://doi.org/10.1177/0162353211417221

Ministerio de Educación, Formación Profesional y Deportes Español. (2020, December). *Ley Orgánica 3/2020, de 29 de diciembre, por la que se modifica la Ley Orgánica 2/2006, de 3 de mayo, de Educación*

[Organic Law 3/2020, of December 29, which modifies Organic Law 2/2006, of May 3, on Education] https://www.boe.es/diario_boe/txt.php?id=BOE-A-2020-17264

Long, H., Kerr, B. A., Emler, T. E., & Birdnow, M. (2022). A Critical Review of Assessments of Creativity in Education. *Review of Research in Education, 46*(1), 288-323. https://doi.org/10.3102/0091732X221084326

Mansour, M., Martin, A. J., Anderson, M., Gibson, R., Liem, G. A., & Sudmalis, D. (2018). Young people's creative and performing arts participation and arts self-concept: A longitudinal study of reciprocal effects. *The Journal of Creative Behavior, 52*(3), 240-255. https://doi.org/10.1002/jocb.146

Martín-Ezpeleta, A., Díaz-Díaz, M., & Echegoyen-Sanz, Y. (2024). Reading and scholarly creativity: A study with Spanish and Chilean preservice teachers. *International Journal of Instruction, 17*(1), 253-270. https://www.e-iji.net/dosyalar/iji_2024_1_14.pdf

Martín-Ezpeleta, A., Fuster-García, C., Vila-Carneiro, Z., & Echegoyen-Sanz, Y. (2022). Leer para pensar creativamente (el COVID-19). Relaciones entre lectura y creatividad en maestros en formación [Reading to think creatively (COVID-19). Relations between reading and creativity in teachers in training]. *Revista Interuniversitaria de Formación del Profesorado, 97*(36.3), 171-190. https://doi.org/10.47553/rifop.v97i36.3.96581

McKay, A.S., Karwowski, M., & Kaufman, J.C. (2017). Measuring the muses: Validating the Kaufman Domains of Creativity Scale (K-DOCS). *Psychology of Aesthetics, Creativity, and the Arts, 11*(2), 216–230. https://doi.org/10.1037/aca0000074

Organisation for Economic Co-operation and Development. (2022). *Thinking outside the box. The PISA 2022 Creative Thinking Assessment*. https://www.oecd.org/pisa/innovation/creative-thinking/

Ozder, H. (2011). Self-efficacy beliefs of novice teachers and their performance in the classroom. *Australian Journal of Teacher Education, 36*(5). http://dx.doi.org/10.14221/ajte.2011v36n5.1

Perera, H. N., Calkins, C., & Part, R. (2019). Teacher self-efficacy profiles: Determinants, outcomes, and generalizability across teaching level. *Contemporary Educational Psychology, 58*, 186-203. https://doi.org/10.1016/j.cedpsych.2019.02.006

Perera, H. N., Granziera, H., & McIlveen, P. (2018). Profiles of teacher personality and relations with teacher self-efficacy, work engagement, and job satisfaction. *Personality and Individual Differences, 120*, 171-178. https://doi.org/10.1016/j.paid.2017.08.034

Plháková, A., Dostál, D., & Záskodná, T. (2015). Hollandova typologie profesnich zajmu ve vztahu k domenove specificke kreativite [Holland's typology of vocational interests in relation to domain-specific creativity]. *Ceskoslovenska Psychologie, 59*(1), 17-56. https://www.proquest.com/docview/1669846080?pq-origsite=gscholar&fromopenview=true

Plucker, J., Beghetto, R. A., & Dow, G. (2004). Why isn't creativity more important to educational psychologists? Potentials, pitfalls, and future directions in creativity research. *Educational Psychologist, 39*(2), 83–96. https://doi.org/10.1207/s15326985ep3902_1

Pont-Niclòs, I., Martín-Ezpeleta, A., Zaragoza-Zayas, M., & Echegoyen-Sanz, Y. (2022). Creativity domains in special needs prospective teachers. *Specialusis Ugdymas*, *2*(43), 3081-3090. http://sumc.lt/index.php/se/article/view/1884/1403

Rhodes, M. (1961). An analysis of creativity. *The Phi Delta Kappan, 42*(7), 305-310. https://www.jstor.org/stable/20342603

Runco, M. A. & Jaeger, G. J. (2012). The Standard Definition of Creativity. *Creativity Research Journal, 24*(1), 92-96. https://doi.org/10.1080/10400419.2012.650092

Said-Metwaly, S., Van den Noortgate, W., & Kyndt, E. (2017). Approaches to measuring creativity: A systematic literature review. Creativity. *Theories–Research-Applications, 4*(2), 238-275. https://sciendo.com/article/10.1515/ctra-2017-0013

Seng, T. C., Aun, T. S., May, C. S., & Hashim, I. H. M. (2016). Factor structure and psychometric qualities of the Kaufman Domains of Creativity Scale. In *International Conference on Education and Psychology* (pp. 389–400). Universiti Malaysia Sabah.

Snyder, H. T., Hammond, J. A., Grohman, M. G., & Katz-Buonincontro, J. (2019). Creativity measurement in undergraduate students from 1984–2013: A systematic review. *Psychology of Aesthetics, Creativity, and the Arts, 13*(2), 133–143. https://doi.org/10.1037/aca0000228

Soh, K. (2017). Fostering student creativity through teacher behaviors. *Thinking Skills and Creativity, 23*, 58-66. https://doi.org/10.1016/j.tsc.2016.11.002

Taylor, C. L. & Kaufman, J. C. (2021). Values across creative domains. *The Journal of Creative Behavior, 55*(2), 501-516. https://doi.org/10.1002/jocb.470

Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J. M., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., El Hayek, S., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D., & Lubart, T. (2023). Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. *Journal of Intelligence, 11*(3), 54. https://doi.org/10.3390%2Fjintelligence11030054

Tu, C. & Fan, F. (2015). Chuàng zào lì de lǐng yù tè shū xìng: Gài niàn hé cè liáng (创造力的领域特殊性：概念和测量) [Domain specificity of creativity: Conception and measurement]. *Advances in Psychology, 5*(11), 648-656. http://dx.doi.org/10.12677/ap.2015.511084

Vincent-Lancrin, S., González-Sancho, C., Bouckaert, M., de Luca, F., Fernández-Barrerra, M., Jacotin, G., Urgel, J., & Vidal, Q. (2019). *Fostering Students' Creativity and Critical Thinking: What It Means in School*. Educational Research and Innovation. OECD Publishing. https://doi.org/10.1787/62212c37-en

Walia, C. (2019). A dynamic definition of creativity. *Creativity Research Journal, 31*(3), 237-247. https://doi.org/10.1080/10400419.2019.1641787

Yates, E. & Twigg, E. (2017). Developing Creativity in Early Childhood Studies Students. *Thinking Skills and Creativity, 23*, 42-57. https://doi.org/10.1016/j.tsc.2016.11.001