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Review of methodological proposals: A categorical grouping taxonomy

Revisión de propuestas metodológicas: Una taxonomía de agrupación categórica

Alejandro Rodríguez-García is a professor and researcher at Universidad de León (Spain) (arodrg01@estudiantes.unileon.es) (https://orcid.org/0000-0002-7258-8857)

Dra. Ana Rosa Arias-Gago is a professor and researcher at Universidad de León (Spain) (ana.arias@unileon.es) (http://orcid.org/0000-0002-5889-3222)

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Abstract

Currently, there is no taxonomy linked to the methodology that groups different methodological elements based on both their active and instructive nature and the educational stage where they are best suited in terms of use. Hence, the objective of this research was to establish a taxonomy taking into account 76 resources, strategies, techniques and teaching methods obtained after a review of the main national and international literature. In order to establish the taxonomy, the EVEMDT scale was developed and validated through the expert judgment procedure. The EVEMDT scale was administered to a panel of 30 experts who attended a training seminar conducted by the researchers, to assess both the instructive or active nature and the 76 methodological elements adaptation to the educational stage. Results shows a taxonomy composed of 25 and 51 didactic resources, didactic strategies, didactic techniques and didactic methods respectively, also classified according to the educational stage where they are best suited in terms of use. It was concluded that taxonomies to compare the results are reduced, so that this taxonomy could be a reference for teachers when deciding what resources, strategies, techniques and teaching methods to use depending both the students´ educational stage and the role they want to give them in their learning processes.

Keywords: Teaching methods, taxonomy, methodologies, active education, traditional education, learning approaches.

Resumen

Actualmente, no existe ninguna taxonomía vinculada a la metodología que agrupe diferentes elementos metodológicos en función del carácter activo e instructivo de los mismos y de la etapa educativa a la que mejor se adecúen en términos de utilización. Por ello, el objetivo de esta investigación fue establecer una taxonomía considerando 76 recursos, estrategias, técnicas y métodos didácticos obtenidos tras una revisión de la principal literatura nacional e internacional. Para establecer la taxonomía, se elaboró y validó por medio del procedimiento de juicio de expertos la escala EVEMDT. La misma, fue administrada a un panel de 30 expertos quienes asistieron a un seminario de formación impartido por los investigadores, para valorar el carácter instructivo o activo y la adecuación a la etapa educativa de los 76 elementos metodológicos. Los resultados permitieron establecer una taxonomía donde aparecen 25 y 51 recursos, estrategias, técnicas y métodos didácticos instructivos y activos respectivamente, clasificados también en función de la etapa educativa a la que mejor se adapten en términos de utilización. Se concluye que, las taxonomías con las que comparar los resultados son exiguas, aspecto que permite a esta ser un referente para los docentes a la hora de decidir qué recursos, estrategias, técnicas y métodos didácticos utilizar en función de la etapa educativa en la que se ubique el alumnado y el papel que quieran dotarle en sus procesos de aprendizaje.

Descriptores: Métodos de enseñanza, taxonomía, metodologías, educación activa, educación tradicional, enfoques educativos.

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1. Introduction and state-of-the-art

The teaching methodology along with the school organization and educational evaluation are one of the most relevant elements of educational didactics and have an essential role in the teaching practice (Canton & Pino, 2014; Fernández-Balboa, 2003; López-Pastor, 2009; Marina et al., 2015), however, despite this relevance, it is complex to find a clear, comprehensive and unified methodological classification.

This problem arises because each author draws up his/her list of teaching methods based on the experience and knowledge, without taking into account the works carried out by other authors; also because each author uses different terminologies to refer to similar methods and because there is a great dispersion when listing different teaching methods (Alcoba, 2010, 2012).

In addition, authors such as Alcoba (2012), Palomares (2011) and Zemelman et al. (2005), state that the terminology linked to the teaching methodology is excessively cryptic, which results in terms such as model, method, technique, strategy and resource being used as synonyms in many cases. This aspect generates a great terminological confusion in the educational community, in this way, in order to try to clarify it, a definition of each of the elements has been established in Table 1, relating an example linked to educational practice.

Table 1. Conceptual delimitation and exemplifications

Didactic method	Didactic method	Didactic strategy/ technique	Didactic resources
Educational components based on an educational theory that allows to determine the purposes, methods and resources to be used, as well as the organization and evaluation to be implemented during the teaching-learning process (Zemelman et al., 2005).	A set of actions that a teacher uses in order to achieve educational objectives, which makes sense as a whole and that responds to a name accepted by the scientific community (Alcoba, 2012).	Concretions based on a didactic method, organized and planned by the teacher; these aim to construct learning through activities and tasks in which they are integrated.(Alcoba, 2012).	Set of tangible or intangible elements, which students and/or teachers use as support and/or complement in their teaching and learning processes. (Díaz-Lucea, 1996).
Example	Example	Example	Example
Active model	Cooperative learning	Round Robin	Paper, pen, timer.

Source: Own elaboration

If we add to the above problems the creation of new methodological approaches as a result of the innovative excitement of many teachers (Pérez-Pueyo & Hortigüela, 2020) in the era of social networks, then it generates the perfect moment that makes it complex to classify them. Therefore, in this study, the aim is to establish a classification taxonomy of the main teaching resources, strategies, techniques and teaching methods based on 3 criteria: (1) active-instructive character, (2) typology (teaching resource, strategy/technique and/or teaching method and (3) adequacy in terms of use in one or more educational stages (Chilhood and Primary, Secondary and High School, Higher Education and all educational stages).

In this way, the teaching methods with an active character linked to criterion 1 are defined as: "Those methods, techniques and strategies used by the teacher to make the teaching-learning process into activities that promote the active participation of the student" (Andreu-Andrés

& Labrador-Piquer, 2011, p. 6). In this way, the use of these methodologies generates the teacher to take on the role of facilitator or guide of the student's learning. This aspect allows the students´ prominence, giving them greater motivation, participation, cooperation, autonomy and self-regulation (Tourón & Santiago, 2015). As opposed to the active methods, the teaching methods with a traditional and instructional vision appear, which are defined as: "Those methods, techniques and strategies that seek the conceptual learning of the student, through the instruction of the teacher and the reception of the students" (Toro Arguis, 2015, p. 4).

To establish taxonomy, a bibliographic review was carried out in the databases Scopus, Web of Science, Dialnet, ERIC and Education Data. The review enabled the following 76 resources, strategies, techniques and teaching methods: Master lesson, participatory master lesson, self-regulation of learning, Work by corners, assembly, project-based activities, learning by simulation, problem-based learning, thought-based learning, learning communities, Flipped classroom, learning by portfolio, centers of interest, Reggio Emilia method, Montessori method, Waldorf method , workshops, total physical response (TPR), Pikler method, Aucouturier method, discovery learning, guided discovery, educational coaching, intelligence bits, cooperative learning, motor wedges or active breaks, self-regulated strategy development (SRSD), learning through discussion groups, case study, Inquiry-based learning, observation learning, mobile learning, CLIL methodology, attitudinal style, teaching contracts, mindfulness, Kolb cycle, learning by graphic organizers, use of the scientific method, interactive groups, open calculation based on number (ABN), e-learning, gamification, learning service, subject-subject tutoring or peer mentoring, learning by discussion or debate, just-in-time teaching, method of preparation and pre-study by automatic online evaluation (PEPEOLA), Amara Berri system, RULER method for emotional development, peer learning, virtual learning, Singapore method, meaningful learning, teacch method, phonics method, neurolinguistics programming (PNL), intelligent comprehension projects, learning through virtual or augmented reality (VR and AR), learning through discussion forums, cognitive modeling, cognitive shaping, systemic pedagogy, learning through copying, learning through dictation, learning through text readings, learning through video tutorials, learning landscapes, chroma key learning, learning via webquest, learning through social networks, game-based learning, challenge-based learning, scape room and educational break out and Kunskapsskolan (Andreu-Andrés & Labrador-Piquer, 2011, Blackshields et al., 2016; Blanchard & Muzás, 2016; Bourner, 1997; De Miguel, 2009; Educacyl, 2019; Hernández & Guárate, 2017; Luelmo, 2018; Nieto & Alfageme-González, 2017; Navaridas, 2004; Paños, 2017; Prieto et al., 2014; Rodríguez-García & Arias-Gago, 2019).

It was also necessary to consider the characteristics that make a methodology active since these served to establish the evaluation dimensions of the scale that allowed the taxonomy to be carried out. Thus, taking into consideration Borko et al. (2010), Crisol (2012), De Miguel (2009), Fernández-March (2006), Gil (2014), Palma et al. (2017), Palomares (2011), Rodríguez-García and Arias-Gago (2019), Silva and Maturana (2017), Toro and Arguis (2015), Vallejo and Molina (2011) and Zabalza (2003), it could be synthesized that the characteristics that cause a methodological approach to be active are the following: It must be based on the interests, needs and motivations of the students; students must learn by doing and by practicing in contextualized situations; it has to generate intrinsic motivation towards learning; creativity, criticism and a sense of initiative and entrepreneurial spirit should be promoted; should develop interpersonal relationships and the social insertion of students through cooperative and collaborative work; should be associated with a comprehensive and authentic evaluation with the characteristics of the student; it must be a means for students to achieve intellectual and moral autonomy; it has to be based on generating glo-

balized topics adapted to the interests of students; it needs to have a flexible organization of spaces, clusters and times; should be based on the collaboration and cooperation of students through the creation of heterogeneous groups; ICT must be used to generate integrated and motivating learning in students; the teacher has to act as a guide and facilitator of the learning process; it has to involve all members of the educational community (family, students, teachers and institutions); it has to be implemented with activities and tasks located in the area of development of the students; it must attend to the diversity of the students, allowing individualized and inclusive teaching with all the students; and it should encourage logical learning, the development of deductive hypothetical thinking, problem solving in contextualized situations, and critical thinking.

Therefore, considering the resources, strategies, techniques and methods, the characteristics presented and the educational stages, a valuation scale was created and applied to a number of experts with the aim of establishing a taxonomy based on objective criteria defining resources, strategies, techniques and teaching methods according to the active and instructive nature and to the adequacy in terms of use to one or more educational stages.

2. Methodology

2.1. Research design

A qualitative-quantitative mixed research design has been used, in which the integrative review method was initially used. According to Guirao (2015), it is characterized in establishing a synthesis on theoretical, methodological knowledge or research carried out in order to outline a theoretical construction and /or conclusion on a specific subject. The review was carried out on the Scopus, Web of Science and Dialnet multidisciplinary databases, focusing the search on educational areas. The ERIC and Education databases were also used, which are specifically linked to the educational field. These databases were selected for integrating repositories, electronic bookstores and national and international high-impact Journals. Also, because they are available in the database catalog of the Universidad de León (Spain) (affiliation of the authors).

The review allowed to delimit 124 bibliographic sources that, after a review and analysis process, resulted in the obtaining of 76 resources, strategies, techniques and teaching methods. The main criterion of inclusion in the list resulted in each proposal or methodological element being cited, at least, in 3 different bibliographic sources.

Subsequently, using the information obtained from the integrative review, the scale for the assessment of cross-cutting teaching methodological approaches (EVEMDT) was developed, in which 76 resources, strategies, techniques and teaching methods have been included.

Once done the elaboration and validation of this scale, the other part was the *ex post-facto* quantitative research design (Colás et al., 2009), where the scale was applied to a panel of experts in active teaching service with extensive knowledge in the subject of teaching methods to establish the taxonomy on didactic methodology.

2.2. Participants

The sample consisted of a panel of 30 (n=30) professors who are experts in teaching methodologies and who were applied the EVEMDT scale. Out of these 30 participants, 22 (n=22) were active teachers who were pursuing the Master's Degree in Research in Psychology and Educational Sciences at Universidad de León and who attended as part of the planning of one of the subjects of the aforementioned Master's Degree to a 20-hour theoretical-practical seminar where the researchers instructed them on the 76 resources, strategies, techniques and teaching methods and, in addition, they developed a theoretical-practical work.

Other components of the panel of experts were doctors in Education and professors-doctors

of Universidad de León with extensive knowledge on the subject and who were instructed on the most uncommon approaches (n=4); also educational counselors graduated in pedagogy, who currently work in the Autonomous Community of Castile and León (n=2), who were also instructed on unknOwn approaches; finally, the study's Own researchers (n=2), who also carried out the assessment using the scale and were responsible for instructing the expert panel.

The fact of being in active teaching service and coursing a master's and/or doctoral studies in the field of Education Sciences, as well as attending the theoretical-practical seminar on teaching methods, are the criteria that have been taken into account to consider participants as experts in the field.

2.3. Instrument

To establish the taxonomy, the EVEDMT scale was designed and developed *ad-hoc* to assess and classify the 76 selected resources, strategies, techniques and teaching methods. This procedure was followed for the development and design of the scale:

Previous analysis of the literature: An integrative review was implemented with which the 76 elements cited were selected. This revision also served to set up the scale valuation dimensions.

Development of the EVEDMT scale: The scale was designed by specifying, drafting and sorting the 20 dimensions of the scale to which the 76 methodological approaches were associated (Table 2). Each dimension in each methodological approach was valued with a scale of 0 to 4 points, where 0 corresponds to the non-tenure of a characteristic and 4 with the maximum tenure. In turn, each resource, strategy, technique and method was associated with the educational stage(s) with which they are adapted in terms of use. For this purpose, each participant associated each element with one or more stages. In this sense, the categories linked to the educational stages were: 1. Chilhood and Primary Education, 2. Secondary Education and High School, 3. Higher Education, 4. All educational stages.

Table 2. Indicators used for the taxonomy development

The methodological approach….
1. Is based on the interests of the student.
2. Generates contextualized learning.
3. Generates intrinsic motivation.
4. Develops student creativity, critical thinking and entrepreneurship.
5. Socially develops the student.
6. Provides authentic and comprehensive evaluation.
7. Develops autonomy and self-regulation.
8. Is based on generator and globalized topics.
9. Requires flexible organization of spaces, times and groupings.
10. Requires collaborative work.
11. Requires the use of ICTs.
12. The teacher acts as a guide and learning facilitator.
13. Involves the entire educational community.
14. Requires exercises, activities, tasks, problems and projects that are located in the students' next development zone.
15. It addresses the diversity of the students and promotes the individualization of the teaching process.
16. Promotes the inclusion of students.
17. Develops hypothetical-deductive thinking and abstraction.
18. Develops the competence of the student.
19. Develops the student's communication and language.
20. Is based on real-world problem situations that encourage the practice of integrated situations

Source: Own elaboration

Scale validation: The expert trial procedure was used. For the validation of content, 5 experts intervened out of which 2 were professors-doctors of Universidad de León and experts in the field; 2 others were active educational counselors in the Autonomous Community of Castile and León; and the other advisor to the Center for Teacher Training and Educational Innovation of the City of León.

Determination of questionnaire reliability: Cronbach's Alpha procedure was used. The reliability of the scale was high with a value of .85, obtaining a r=.856 for the items, which surpasses, according to Castañeda et al. (2010), the lower limit considered to be reliable.

Final drafting of the EVEDMT scale: The scale was finally composed of 20 dimensions to be assessed in each of the 76 methodological approaches selected as a result of appearing in at least 3 sources of the revision. In addition, each element had to be integrated into the educational stage(s) that best suits in terms of use.

For the assessment of the methodological elements, once the scale has been completed for each of the participants, a system of categories was designed exhaustively and mutually exclusive (Table 3), with which to assess the active or instructive nature of each methodological approach.

Table 3. Comprehensive and mutually exclusive category system

Category	Scores
Resources, strategies, techniques and instructional methods	0-2
Resources, strategies, techniques and active methods	2,0001-4

Source: Own elaboration

For its part, to associate each resource, strategy, technique and method with a specific educational stage, it was established that, at least, there should be a minimum frequency of 10 selections; in this way, the bias that can be caused when a methodological element generates doubts in the participants when it is classified is reduced.

2.4. Statistical analysis

It was performed with version 26 of the SPSS program, considering the criteria of Tejedor and García-Valcarcel (2012) and implementing the following analyses:

Analysis of average and frequency values: The average values were used to establish the active or instructive character of the 76 methodological elements integrated into the scale depending on the established category system. In turn, frequencies were used to classify the 76 methodological elements into one or more educational stages.

3. Results

3.1. Teaching resources, strategies, techniques and instructional methods

The resulting classification after the valuation by the selected panel of experts is presented in Table 4, in which are shown from the highest to the lowest the instructional character, the different resources, strategies, techniques and methods selected in the review carried out. In this regard, the number of instructive methodological elements amounts to 25, a significantly lower number than the active elements that is composed of 51. In the classification, the type to which they belong (method, Technique/strategy

and resource) has also been assessed as well as the educational stage to which they best suit in terms of their use.

In this way, in the stages of Early Childhood and Primary Education, the resulting instructional methods ordered according to the greatest instructive character are as follows: Total Physical response $\bar{x}$=1.2, Phonics $\bar{x}$=1.25, Teacch Method $\bar{x}$=1.45, strategic and self-regulated instruction method for writing learning (SRSD) $\bar{x}$=1.6, and CLIL method $\bar{x}$=1.65. For its part, the strategy/technique that appears in the stages of Early Childhood and Primary Education is the intelligence bits $\bar{x}$=.85.

In Elementary and High School, the methods that appear are the following: Phonics $\bar{x}$=1.25, educational coaching $\bar{x}$=1.5, and CLIL method $\bar{x}$=1.65. Both educational coaching and the CLIL method are also suited to Higher Education and the Elementary and High School stages, respectively.

At the level of Higher or University Education, the only method that has been classified as instructive is the educational coaching $\bar{x}$=1.5, the use of which is also suited to the stages of Elementary and High School.

For its part, there are various methods, techniques/strategies and teaching resources that are adapted in terms of their use to all the above stages. In this way, the resulting methods are as follows: Master lesson $\bar{x}$=.5, participatory master lesson $\bar{x}$=.6, observation learning $\bar{x}$=1, Mindfulness $\bar{x}$=1.45, Kolb Cycle=1.75, and e-learning $\bar{x}$=1.8. In turn, the strategies/techniques integrated into the taxonomy are as follows: Learning through copying $\bar{x}$=.4, learning through $\bar{x}$=.45, teaching contracts $\bar{x}$=.7, modeling $\bar{x}$=.75, molded $\bar{x}$=.8, learning using readings $\bar{x}$=.9, video-tutorial learning $\bar{x}$=-1.35, discussion groups $\bar{x}$=1.65, and learning landscapes $\bar{x}$=1.95. Finally, teaching resources such as the graphic organizers $\bar{x}$=1.35, the portfolio $\bar{x}$=1.4 and the discussion forums $\bar{x}$=1.9, are also adapted to all educational stages.

Table 4. Classification of instructional methods, techniques, strategies and teaching resources

Didactic resources, strategies, techniques and instructional methods ($\bar{x}$=0-2)																		
N°	Nomenclature	$\bar{x}$	Type			Educative phase				N°	Nomenclature	$\bar{x}$	Type			Educative phase			
			1	2	3	1	2	3	4				1	2	3	1	2	3	4
1	Learning through copying	.4		x					x	14	Video-tutorial learning	1.35		x					x
2	Learning through dictation	.45		x					x	15	Portfolio	1.4			x				x
3	Master class	.5	x						x	16	Mindfulness	1.45	x						x
4	Participative master class	.6	x						x	17	Teacch method	1.45	x			x			
5	Teaching contracts	.7		x					x	18	Educative coaching	1.5	x				x	x	
6	Modeling	.75		x					x	19	SRSD method	1.6	x			x			
7	Molded	.8		x					x	20	Discussion groups	1.65		x					x
8	Intelligence Bits	.85		x		x				21	CLIL method	1.65	x			x	x		
9	Learning using readings	.9		x					x	22	Kolb cycle	1.75	x						x
10	Observation learning	1	x						x	23	E-learning	1.8	x						x
11	Total physical response	1.2	x			x				24	forum-based learning	1.9			x				x
12	Phonics	1.25	x			x	x			25	Landscape learning	1.95		x					x
13	Learning using graphic organizers	1.35			x				x										

Notae. Type: 1. Method, 2.Technique/strategy, 3. Resource. Educative phase: 1. Kindergarten and Primary, 2. Elementary and High School, 3. Higher Education, 4. All phases

Source: Own elaboration

3.2. Teaching resources, strategies, techniques and active methods

As in the previous section, Table 5 explains the classification carried out by the panel of experts in which are located from the highest to the lowest active character the different resources, strategies/techniques and methods selected in the review carried out. In this classification, the number of elements included is significantly higher than in the previous case (51 to 25).

Continuing the grouping carried out in the stages of Early Childhood and Primary Education, have been included the following methods in function of the highest to the lowest of the active character: Amara Berri $\bar{x}$=3.7, Kunskapsskolan $\bar{x}$=3.65, Montessori method $\bar{x}$=3.6, Reggio Emilia $\bar{x}$=3.4, learning communities $\bar{x}$=3.2, Aucouturier method $\bar{x}$=3.15, Pikler method $\bar{x}$=3.15, intelligent understanding projects $\bar{x}$=3.05 , open calculation based on number (ABN) $\bar{x}$=2.95, Singapore method $\bar{x}$=2.9, Waldorf method $\bar{x}$=2.85, guided discovery $\bar{x}$=2.8, areas or group work $\bar{x}$=2.75, Ruler method $\bar{x}$=2.6, assembly $\bar{x}$=2.5, systemic pedagogy $\bar{x}$=2.4, and neurolinguistic programming (PNL) $\bar{x}$=2.35.

In Elementary and High School stages, the methods included are the following: Learning communities $\bar{x}$=3.2, intelligent understanding projects $\bar{x}$=3.05, mobile learning $\bar{x}$=2.7, systemic pedagogy $\bar{x}$=2.4, just in time teaching $\bar{x}$=2.4, method of preparation and pre-study by automatic on-line evaluation (PEPEOLA) $\bar{x}$=2.15 and virtual learning $\bar{x}$=2.05. In turn, the strategies/techniques integrated into the taxonomy were: Learning through social networks $\bar{x}$=2.68 and tutoring between peers $\bar{x}$=2.1.

In Higher Education or University, the methods included that were consistent with those of the Elementary and High School are: Mobile learning $\bar{x}$=2.7, just in time teaching $\bar{x}$=2.4, method of preparation and pre-study by automatic online evaluation (PEPEOLA) $\bar{x}$=2.15 and virtual learning $\bar{x}$=2.05. Additionally, the strategies/integrated are equal to Elementary and High School.

As in the previous case, there are various methods, strategies, techniques and teaching resources that are adapted and can be used in all educational stages mentioned. In this way, the methods integrated into this category are as follows: Project-based learning $\bar{x}$=3.7, Cooperative learning 3.35, problem-based learning $\bar{x}$=3.3, challenge-based learning $\bar{x}$=3.25, service learning $\bar{x}$=3.25, gamification $\bar{x}$=3.25, attitudinal style $\bar{x}$=3.2, case study $\bar{x}$=3.1, game-based learning $\bar{x}$=3, Centers of interest 2.9, Peer Learning $\bar{x}$=2.85, Self-Regulation of Learning $\bar{x}$=2.82, Discovery Learning $\bar{x}$=2.8, Workshops $\bar{x}$=2.7, Flipped classroom $\bar{x}$=2.75, inquiry learning $\bar{x}$=2.65, meaningful learning $\bar{x}$=2.55, and thought-based learning $\bar{x}$=2.55. In turn, the strategies/techniques integrated into the taxonomy according to their adequacy and use in all educational stages are: Escape room and educational break out $\bar{x}$=3.35, interactive groups $\bar{x}$=3.1, learning using virtual reality and augmented reality (VR and AR) $\bar{x}$=3.05, use of the scientific method $\bar{x}$=2.7, simulation $\bar{x}$=2.65, learning by debate $\bar{x}$=2.6 and motor wedges or active breaks $\bar{x}$=2.1. Finally, teaching resources such as webquest $\bar{x}$=2.65, learning via videos and movies $\bar{x}$=2.45, and learning using chroma Key $\bar{x}$=2.25, are adapted and used in all educational stages.

Table 5. Classification of active methods, strategies, techniques and teaching resources

Didactic resources, strategies, techniques and instructional methods ($\bar{x}$=2.0001-4)																		
N°	Nomenclature	$\bar{x}$	Type			Educative phase				N°	Nomenclature	$\bar{x}$	Type			Educative phase			
			1	2	3	1	2	3	4				1	2	3	1	2	3	4
1	Project-based learning	3.7	x						x	27	Discovery learning	2.8	x						x
2	Amara Berri System	3.7	x			x				28	Guided discovery	2.8	x			x			
3	Kunskapsskolan	3.65	x			x				29	Workshops	2.78	x						x
4	Montessori method	3.6	x			x				30	Flipped classroom	2.75	x						x
5	Reggio Emilia	3.4	x			x				31	Work by corners	2.75	x			x			
6	Escape Room and Breakout	3.35		x					x	32	Mobile learning	2.7	x				x	x	
7	Cooperative learning	3,35	x						x	33	Scientific method	2.7		x					x
8	Problem-based learning	3.3	x						x	34	Social network learning	2.68		x			x	x	
9	Challenge-based learning	3.25	x						x	35	Inquiry based learning	2.65	x						x
10	Service learning	3.25	x						x	36	Simulation	2.65		x					x
11	Gamification	3.25	x						x	37	Webquest learning	2.65			x				x
12	Learning communities	3.2	x			x	x			38	Ruler method	2.6	x			x			
13	Attitudinal style	3.2	x						x	39	Debate-based learning	2.6		x					x
14	Aucouturier method	3.15	x			x				40	Significant learning	2.55	x						x
15	Pikler method	3.15	x			x				41	Though-based learning	2.55	x						x
16	Interactive groups	3.1		x					x	42	Assembly	2.5	x			x			
17	Case studies	3.1	x						x	43	Learning using videos and films	2.45			x				x
18	VR and AR learning	3.05		x					x	44	Systemic pedagogy	2.4	x			x	x		

Didactic resources, strategies, techniques and instructional methods ($\bar{x}$=2.0001-4)																		
N°	Nomenclature	$\bar{x}$	Type			Educative phase				N°	Nomenclature	$\bar{x}$	Type			Educative phase			
			1	2	3	1	2	3	4				1	2	3	1	2	3	4
19	Intelligent understanding projects	3.05	x			x	x			45	Just in time teaching	2.4	x				x	x	
20	Game-based learning	3	x						x	46	Neurolinguistic programming	2.35	x			x			
21	ABN	2.95	x			x				47	Chroma key learning	2.25			x				x
22	Interest centers	2.9	x						x	48	PEPEOLA learning	2.15	x				x	x	
23	Singapore method	2.9	x			x				49	Peer mentoring	2.1		x			x	x	
24	Peer learning	2,85	x						x	50	Active breaks	2.1		x					x
25	Waldorf method	2.85	x			x				51	Virtual learning	2.05	x				x	x	
26	Self-regulation	2.82	x						x										

Note. Type: 1. Method, 2. Technique/strategy, 3. Resources; educative phase. 1. Kindergarten and Primary, 2. Elementary and High School, 3. Higher Education 4. All the phases

Source: Own elaboration.

4. Discussion and conclusions

The study has assessed and classified a total of 76 resources, techniques, strategies and teaching methods, which have been selected after carrying out an integrative review process in the explicit databases. In this sense, it should be mentioned that no taxonomy has been found in the literature where different elements are classified in an eclectic way according to their active and instructive nature and depending on the educational stage(s) to which they best suit in terms of their use. In this sense, these focus on a specific stage or discipline. A clear example of the above is the classification established by Delgado (1991) in the field of physical education, where 6 classification groups of teaching styles are established: (1) traditional, (2) individual, (3) participatory, (4) socializers, (5) cognitive and (6) creative; in which different teaching styles are integrated according to criteria such as the attitude adopted by the teachers, the direction and organization of the class, the control of the teacher and the content and planning of the study among others. It should be mentioned that, in this classification, the taxonomy is carried out only with the analysis established by the author.

In the same field of physical education and more recently, it is noteworthy the classification of pedagogical models linked to Physical Education, in which 2 large classification groups similar to this taxonomy are established to integrate the different pedagogical models – consolidated pedagogical models and emerging models – (Fernández-Rio et al., 2018).

On the other hand, it is noteworthy the classification of university methodological approaches developed by Alcoba (2012) and Bourner (1997), in which, similar to our study, after following a bibliographic review and a panel procedure of experts, a total of 22 and 52 main methodological approaches were established respectively, although these were not classified into categories.

In parallel with the previous case, Navaridas (2004) establishes 4 classification groups of techniques, strategies, methods, models and teaching styles: (1) traditional methods, (2) cognitive-behavioral methods, (3) metacognitive methods and (4) support methods.

For its part, the classifications established by Borko et al. (2010) and OCDE (2016), present more similarities with this research. The first establishes 2 teaching method classification groups: (1) traditional approaches and (2) modern or contemporary approaches; and the second classifies various teaching methods according to the categories of guided learning, active learning and cognitive activation.

There are numerous empirical studies in which various methodological approaches are used as a dependent variable, where the criteria for their inclusion are not exhaustively delimited, although they have still served to establish this taxonomy (Crisol, 2012; Rodríguez-García & Arias-Gago, 2019). There are also other related to constructions and theoretical revisions that have also been considered (De Miguel, 2009; Nieto & Alfageme-González, 2017; Paños, 2017; Prieto et al., 2014; Silva & Maturana, 2017; Toro & Arguis, 2015).

To conclude, the established results materialized in an empirical taxonomy elaborated with the help of an expert group and applied at *ad hoc* scale have allowed to classify 76 resources, strategies, techniques and teaching methods in an eclectic way, according to their instructive or active nature and depending on the teaching stage to which they are best suited and adapted in terms of their use (Tables 4 and 5). Therefore, this taxonomy — the only one in the literature that considers the criteria mentioned — can help teachers in knowing and deciding which methods are more appropriate to implement based on the educational stage, the role they want to take in their teaching processes, and the role they want to give to their students in their learning processes—active or instructive). All these implications become more relevant due to the terminological complexity of this field of

didactics and the cryptic nature of the different concepts, which were clarified in the introduction of the paper to facilitate the understanding and allow the progress in this essential aspect of the teaching role.

Despite these implications, the research has a number of limitations: The first relates to the fact that this publication could not detail in depth the review established to select the 76 methodological elements of the taxonomy. In this sense, the aforementioned limitation opens a new line of research focused on the elaboration of a publication detailing the revision implemented. The second limitation relates to the low conceptual delimitation of each of the elements that make up the taxonomy, opening new possible lines of research where, on the one hand, each methodological element is defined in depth and, on the other hand, each method is associated with the related strategies and techniques. The last limitation is linked to the scarcity of national and international literature associated with taxonomies on methodological aspects. This circumstance provides added value to the research and offers teachers a reference in deciding what resources, strategies, techniques and teaching methods to use depending on the role that they want to give to their students and the educational stage in which they are located.

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