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The Training Needs of In-Service Teachers for the Teaching of Historical Thinking Skills in Compulsory Secondary Education and the Baccalaureate Level

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In a context of change such as that which is currently taking place in the field of social sciences education, the ongoing training of in-service teachers is an essential element. Only by bringing about a true change in their teaching practice can teaching approaches and the processes of history education be improved. The present paper aims to contrast a theoretical model with a questionnaire designed to identify the training needs of secondary and baccalaureate teachers with regard to the teaching of the historical thinking skills. A quantitative research methodology has been employed with a non-experimental design in which an exploratory and confirmatory factor analysis and a hierarchical clustering analysis have been carried out. After carrying out and applying the analysis, a questionnaire (NFPA) was elaborated. Its construct validity and reliability were satisfactory and appropriate. The results will make it possible to detect and identify needs and deficiencies in ongoing teacher training. Furthermore, it will become possible to discover new elements in order to improve training processes from the point of view of in-service teachers.

Keywords: training needs, teacher training, compulsory secondary education, baccalaureate, historical thinking skills, questionnaire, validity, reliability

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INTRODUCTION

The new frameworks of reference in the field of social sciences education advocate the development of historical thinking skills. There is also a decreasing preference for a history teaching model based solely on factual and conceptual knowledge which must be memorized by the students and in which the use of the textbook persists as the main teaching resource (Sáiz and López Facal, 2012; Valls, 2012; Gómez and Miralles, 2017; Carretero, 2019). A form of history education is proposed which extends beyond theoretical aspects and focuses more on the skills needed to access, understand, interpret, and explain the past. This model presents history as a reality which is open to research and can be studied in an autonomous way in order for students to build their own representations of the past (Lee, 2005; Barton, 2008; Santisteban, 2010, 2019; Sáiz and Fuster, 2014; VanSledright, 2014; Sáiz and López Facal, 2015).

The development of these historical thinking skills has led to progress being made toward a less traditional and transmissive teacher-based model, focusing rather on student learning and on the

implementation of strategies and resources which permit the development of these skills (Lévesque, 2008; Van Drie and Van Boxtel, 2008; Seixas and Morton, 2013; Domínguez, 2015; Soler et al., 2018).

The demands which derive from these changes are linked, on the one hand, with a teaching model which is centered on the historical thinking skills, focusing not only on the acquisition of knowledge, but also on the skills, attitudes, and values which are useful and sought-after in the current social and cultural context. On the other hand, these demands are linked with the implementation of active learning methods involving the use of appropriate strategies and resources (Barton and Levstik, 2004; Gómez and Miralles, 2016; Fuentes et al., 2019). Different studies have shown that the teaching methods adopted are heavily influenced by the teachers' approaches to teaching and their relationship with their students' learning approaches and academic results (Kember and Gow, 1993; Trigwell et al., 1999; Kember and Kwan, 2000; Gibbs and Coffey, 2004; Trigwell and Prosser, 2004; Postareff et al., 2008; Gargallo et al., 2015). Likewise, the use of a specific teaching approach may be related with the use of a specific model, strategy, or resources in the classroom (Gómez et al., 2016; Guerrero-Romera et al., 2021, 2022; Gómez-Carrasco et al., 2022).

Furthermore, the diversification of teaching resources for History and Geography education (digital resources, heritage, written, and oral sources, etc.) has demonstrated the importance of employing resources which encourage the students' participation and involvement (Colomer and Sáiz, 2019). Indeed, there are many studies which explore the use and effects of such resources in both learning and training (Gómez and Miralles, 2016; López Facal et al., 2017; Gómez and Sobrino, 2018; Estepa, 2019).

In addition, some authors have shown that there is a close link between the positive evaluation of certain resources and the use of active learning methods (Cózar-Gutiérrez and Sáez-López, 2016; Miralles et al., 2017; Gómez and Sobrino, 2018).

In this new scenario, the teacher's performance is a key aspect as this change in perspective from which the teaching process of history is conceived and managed requires a teaching profile that enables the educator to successfully face these challenges. Salazar (2016) stated that there does not appear to be a positive correlation between what teachers consider to be appropriate for teaching with the reality in the classroom. This is because practices and routines of a traditional nature still persist today and there is still a gulf between knowledge-based teaching and skills-based teaching (Sáiz and Fuster, 2014; Prats, 2016; König et al., 2017; Colomer et al., 2018b; Parra and Fuertes, 2019). Indeed, only through a true change in the teaching activity of in-service teachers improvements can be made in terms of teaching approaches and processes (Lévesque and Zanazanian, 2015).

Some studies have stated that one of the greatest difficulties when employing innovative methodologies and resources into the classroom can be found in the level of training received by teachers (Engen et al., 2015; González-Fernández et al., 2015; Gisbert et al., 2016; Instefjord and Munthe, 2017; Colomer et al., 2018a; Ibáñez-Etxeberria et al., 2019). Gómez et al. (2020), have also pointed out that it is necessary for there to be a process of updating in terms of the methodology, strategies, and teaching resources employed in the classroom.

Authors such as Cabero (2014), Girón et al. (2019), and Colomer et al. (2018a) have stated that teacher training and the lack of a model of teaching skills based on digital technologies are the main disadvantages for putting these types of resources in practice. García-Martín and García-Sánchez (2017), in a study on pre-service teachers, have also related these competencies with the implementation of active learning methods and with the use of innovative strategies and approaches.

Most research insists on the importance of teacher training in the improvement of the learning process for history and the other social sciences in compulsory education (Cochran-Smith and Zeichner, 2005; Darling-Hammond and Bransford, 2005; Comisión Europea, 2012; Barnes et al., 2017). However, it is often stated that there is still a need for a deeper understanding of this issue (Schmidt et al., 2011; Pollock, 2014; König et al., 2017; De Groot-Reuvekamp et al., 2018).

In addition, teacher training has been highlighted as a key factor in improving the quality of education and academic results (EURYDICE, 2008, 2012; OCDE, 2010, 2019; Comisión Europea, 2012; Manso et al., 2019). Teacher training activities have also been pointed out as an extremely influential factor in the quality of teaching (Cid et al., 2013).

However, in spite of these considerations and the fact that, in recent years, there has been a growing interest in studies on teacher training and the development of the historical thinking skills, especially those relating to initial teacher training (Miralles et al., 2019; Gómez-Carrasco et al., 2020; Gómez et al., 2020), studies focusing on ongoing training and the training needs of Secondary Education Social Sciences teachers are less common (González and Skultety, 2018; Parra and Fuertes, 2019). Indeed, authors such as Oliveira et al. (2019), and Miralles et al. (2019) have stated that it is necessary for research to be carried out on the training needs which stem from classroom practice. Thus, there is a need to gain a deeper understanding of this area and to develop alternatives and training proposals that will contribute toward the updating and development of teachers' professional competencies. This will enable them to be trained in historical thinking and the use and implementation of new teaching and methodological strategies and will provide students with an active role in their own learning (Soler et al., 2018).

The previous studies on history and social sciences teachers have shown that optimization of pedagogical content knowledge among teachers and how the subject is understood and represented is key to being able to exploit curricular materials in a much more effective way for the design of classroom activities and to improve the effectiveness of learning (Bolívar, 2005; Gudmundsdóttir and Shulman, 2005). Meschede et al. (2017) and Van Straaten et al. (2018) have stressed the importance in teacher training of the improvement of knowledge, skills, and teaching competencies related with the fields of methodology and epistemology (Floden, 2015; Barnes et al., 2017).

All of this leads to a reflection on teachers' training needs and, particularly, on what contents should be included in training programs from the identification and prioritization of the needs expressed by teachers in relation to their own practice and

regarding the elements described with the aim of adopting less traditional teaching strategies and resources in the future.

In this regard, some validated tools exist for the assessment of teaching approaches, methodologies and resources of social sciences teachers, although there are still few which assess the training needs of in-service secondary education teachers (Monroy et al., 2015; Miralles et al., 2019; Sánchez Ibáñez et al., 2020; Sánchez-Ibáñez et al., 2021; Gómez-Carrasco et al., 2022).

This research, therefore, seeks to provide a questionnaire aimed at in-service teachers in order to obtain information on the most relevant training needs for teaching. The issue to be addressed explores and analyses the training needs that teachers who teach Geography and History in secondary education in Spain consider to be most relevant and urgent. This will make it possible to investigate the extent to which teachers consider that they are prepared to incorporate into their teaching practice the advances in research on the teaching and learning of the social sciences and new didactic proposals.

MATERIALS AND METHODS

Research Design

In order to achieve the proposed aims, a quantitative methodology with a non-experimental design was employed which was cross-cutting and correlational in nature. Data were collected *via* a questionnaire with the Likert scale (1–5).

Participants

The study is based on a convenience sample consisting of 68 in-service teachers from different schools in the Region de Murcia. The sample was equally balanced according to sex with 48.5% women and 50% men (1.5% did not respond to either of these options). Approximately, 80.9% of the sample was aged between 40 and 59 with only 21.9% of the participants being between 21 and 39 years of age (**Table 1**). As far as the level of education in which the participants teach is concerned, 56.55% taught in secondary education and 39.8% in baccalaureate, with 3.7% teaching in other levels of education.

Instrument

The questionnaire entitled "Training needs of in-service Secondary Education teachers in Spain" (NFPA in its Spanish acronym) has been created based on a review of the existing literature and the adaptation of the CUMECISO instrument on approaches, methods, and resources for history teaching and the NEFOPRO structured interview on teacher training needs. It consists of a Likert-type evaluation scale (1–5) with eight socio-demographic questions and 24 items grouped into three dimensions.

The first part of the tool, concerned with identification, gathers data of a socio-demographic nature (sex, age, academic education, level of education in which the participant teaches, and other levels of education in which the participant has taught). The second part of the questionnaire consists of three dimensions. The first and second dimensions are concerned with training needs related with methodologies and digital resources and other teaching resources for the teaching of History and were adapted from the CUMECISO and NEFOPRO, in their Spanish acronyms. The third dimension addresses "other skills" and takes into account the key and cross-cutting competencies identified in the teaching profile for the compulsory Secondary Education by Martínez-Izaguirre et al. (2018) and the factors and competencies identified by the Comisión Europea (2015).

Following the creation of the tool, the contents of the dimensions were validated by five experts (researchers and teachers in the area of the social sciences) who were required to assess the sufficiency, clarity, and relevance of the items on a scale of 1–5. A mean of more than 4 was obtained in all cases. Therefore, after the interpretation of the results of the validation, the statements of the questionnaire's items were not modified. Subsequently, a pilot test was administered to 68 teachers. The aim of this test was to discover their degree of understanding of the different items and to analyze the construct validity (factor analysis by way of the extraction of main components with the Varimax rotation).

Procedure and Data Analysis

The content validity of the initial questionnaire was determined by way of E-mail contact with five experts. Once validated, it was applied to the participating teaching staff online using the University of Murcia's survey platform.

The data analysis process was carried out in two phases: (a) the internal reliability analysis of the tool *via* Cronbach's alpha and McDonald's omega coefficient. In order to discover the construct validity, exploratory, and confirmatory factor analyses were also performed, employing Bartlett's Test of Sphericity and a principal component analysis (PCA) and (b) hierarchical clustering was performed in order to establish the groups. For this purpose, the IBM SPSS (v. 19) and Jamovi 1.1.0 were used.

TABLE 1 | Age ranges of participating teachers.

Age	*N*	Valid percentage
21–29	2	2.9
30–39	11	16.2
40–49	39	57.4
50–59	16	23.5
60 and over	0	0
Total	68	100

DESCRIPTION OF THE RESULTS

The results obtained are presented below. Firstly, with regard to the analysis of the reliability and validity of the questionnaire on the training needs of in-service Secondary Education teachers, the method of internal consistency based on the Cronbach's ordinal alpha and McDonald's omega coefficient based on factor loadings (which are the weighted sum of the standardized variables) has been employed. In the case of the NFPA questionnaire, an overall ordinal alpha coefficient $\alpha = 0.904$ was obtained, which can be considered to be excellent. The overall McDonald omega coefficient of the scale was $\omega = 0.900$,

which can also be considered suitable. **Table 2** shows the coefficients according to dimensions.

In order to discover the construct validity, exploratory, and confirmatory factor analyses were carried out to determine the dimensions or sections of the tool. After verifying the suitability of the data for the factor analysis *via* the Kaiser Meyer Olkin test (KMO) and Bartlett's Test of Sphericity (KMO = 0.760; Bartlett's Test of Sphericity, $\chi^2 = 1{,}227.871$; df 276, $p < 0.001$), an optimized parallel analysis was performed (Lorenzo-Seva et al., 2011). After carrying out these prior verifications, the optimized parallel analysis attained an optimal solution of five factors which explain 73.12% of the variance of the original data (**Table 3**).

After employing the Varimax with Kaiser Normalization rotation method, the principal component analysis reveals the convergence in three factors which explain 61.73% of the variance; the items show appropriate values, situated between 0.304 and 0.882 (**Table 4**). Comparing the relative saturations of each variable in each of the three factors, it can be appreciated that the first factor, with an eigenvalue of 7.7, explains 32.1% of the common variance. It has been named "methodologies" and is composed of seven items (1; 2; 3; 4; 5; 6; and 7): *Flipped classroom; Cooperative learning; Gamification; Problem-based and challenge-based learning; Design skills and educational programming and research-innovation in the classroom; Artistic productions (paintings, architecture, sculptures, etc.); and Competencies for the development of an intercultural and community-based approach.*

The second factor, named "other teaching resources," with an eigenvalue of 4.2, explains 17.6% of the common variance and is composed of seven items (15; 16; 17; 18; 21; 22; and 24): *The use of historical sources; Museums and other centers of interpretation and heritage interest; Cinema, documentaries, historical novels, comics, literature; Disciplinary updating (Geography and History); The creation of videos, and digital printing, etc.; The development of tutorials and guidance; and Assessment strategies and techniques.*

The third factor, with an eigenvalue of 2.8, explains 11.8% of the common variance. It has been named "digital resources" and is composed of seven items (8; 9; 10; 11; 12; 13; and 14): *Project-based learning; Virtual learning environments (VLE); Video games; Role playing; Augmented and expanded reality; Geolocation devices (Google Earth, digital maps, etc.); and Service learning.*

In relation to the analysis of the in-service teachers' response groups and their differences with regard to the factors shown in the NFPA questionnaire, a hierarchical clustering analysis has been carried out according to the mean response to each of the factors. As can be observed in **Figure 1**, the items which are closest together are grouped into clusters. This would mean that each of these groups of items could form part of the same factor and that these factors are related to among themselves. The line indicates the given limit for creating the groups. Of the three sections of contents contained in the tool, the representation by clusters indicates a grouping into three factors, two of which can be clearly identified and a third which contains two sub-groups (**Figure 1**).

As can be seen in the analysis of the rotated components (**Table 3**), the third factor encompasses resources that can be considered to be digital, displacing items from the theoretical

TABLE 2 | Reliability indices.

Dimensions		Alpha	Omega
Methodology	1	0.910	0.910
Resources	2	0.839	0.848
Other competencies	3	0.786	0.790
	Total	0.904	0.900

TABLE 4 | Distribution of the items into three components.

Component 1		Component 2		Component 3	
Item	Value	Item	Value	Item	Value
Item 1	0.801	Item 15	0.86	Item 8	0.76
Item 2	0.76	Item 16	0.88	Item 9	0.66
Item 3	0.80	Item 17	0.85	Item 10	0.69
Item 4	0.79	Item 18	0.82	Item 11	0.57
Item 5	0.81	Item 21	0.61	Item 12	0.83
Item 6	0.74	Item 22	0.51	Item 13	0.79
Item 7	0.60	Item 24	0.69	Item 14	0.79

TABLE 3 | Principal component matrix—analysis of the principal components.

Total explained variation									
Component	Initial eigenvalues			Sums of the saturations to the square of the extraction			Sums of the saturations to the square of the rotation		
	Total	% of the variance	Accumulated %	Total	% of the variance	Accumulated %	Total	% of the variance	Accumulated %
1	7.725	32.187	32.187	7.725	32.187	32.187	5.202	21.677	21.677
2	4.245	17.687	49.874	4.245	17.687	49.874	4.368	18.201	39.878
3	2.847	11.862	61.736	2.847	11.862	61.736	4.269	17.788	57.666
4	1.567	6.531	68.267	1.567	6.531	68.267	2.387	9.945	67.612
5	1.167	4.863	73.130	1.167	4.863	73.130	1.324	5.518	73.130

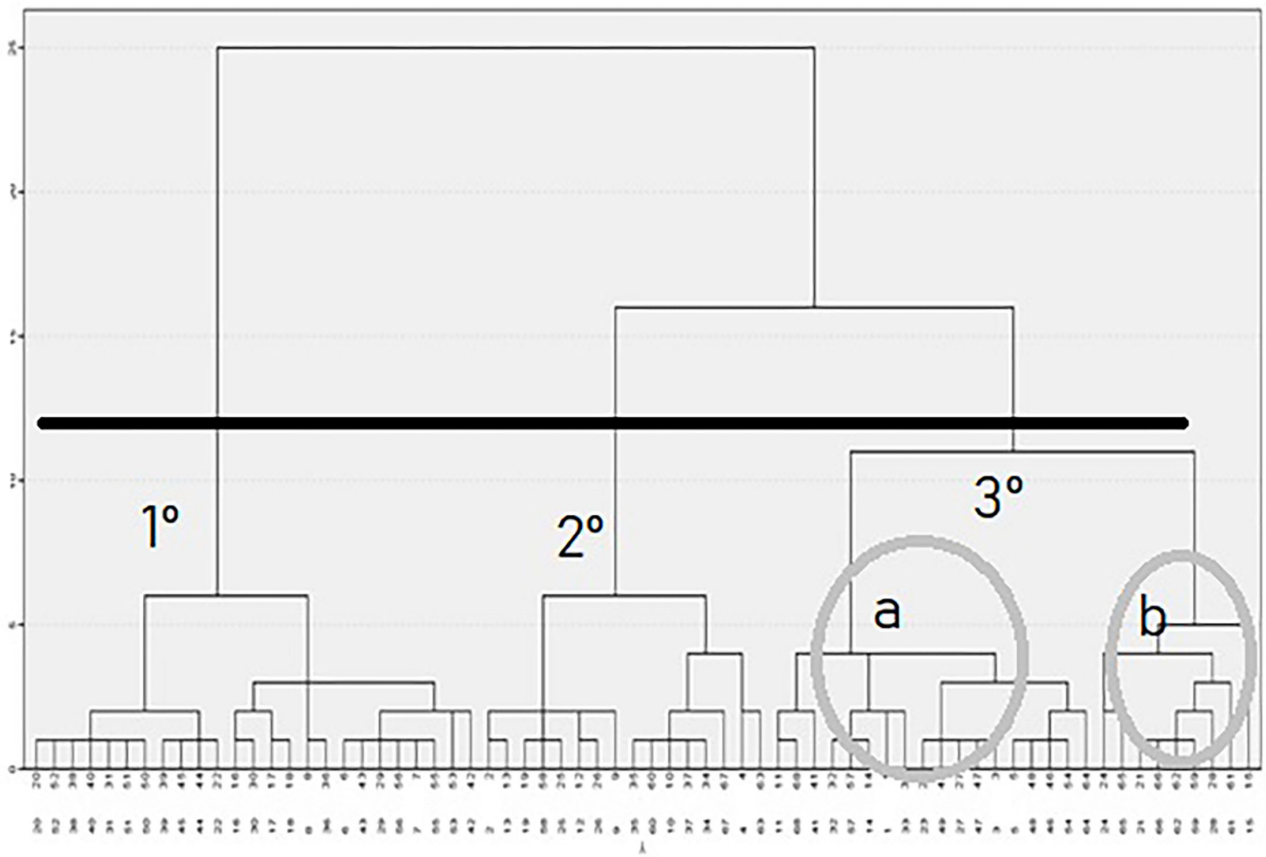

FIGURE 1 | Dendrogram groups.

TABLE 5 | Sub-groups 3rd cluster.

a: Digital resources	b: Other teaching resources
1. Videogames	1. Use of historical sources
2. Virtual learning environments (VLE)	2. Museums and other centers of interpretation and heritage interest
3. Geolocation devices (Google Earth, digital maps, etc.)	3. Other resources such as cinema, documentaries, historical novels, comics, literature
4. Mobile applications	4. Artistic productions (paintings, architecture, sculptures, contemporary art, etc.)
5. Platforms for the creation of contents: websites, blogs, etc.	
6. Creation of videos, digital printing, etc.	

section of resources to the second factor, which encompasses other types of teaching resources considered to be more classical or traditional in the teaching of the social sciences. It was verified that the third cluster, due to the higher number of items grouped and their division into two sub-groups, makes it possible to differentiate between a first sub-group, named "a", in which the items are more related with "digital resources", and a second sub-group, named "b", the resources of which are more related with "other teaching resources" (**Table 5**).

In order to verify the relationships in which these items maintain among themselves within each cluster, the analysis was repeated and its characteristics were analyzed *via* the comparison of means, which indicates the true distribution of the items in the three groups. The first group prioritizes other teaching resources which can be considered to be more "traditional" and the items belonging to the "methodologies" section and gives lower scores to items relating to "digital resources." The second group prioritizes digital resources and the items belonging to the "methodologies" section and gives lower scores to items from the group of "other digital resources" (which encompass other teaching resources and "other competencies"). The third group evaluates all of the "digital" resources, "other teaching resources" and "other competencies" extremely high, with the exception of two belonging to the latter group which are particularly striking (tutorials and guidance and disciplinary updating). In addition, for this group, the items relating to the "methodology" section are the least valued.

This grouping can be appreciated in the Path Analysis (PA) (**Figure 2**). The graph makes it possible to verify the fit of the theoretical models proposed in the tool, as well as to identify the direct and indirect contributions made by

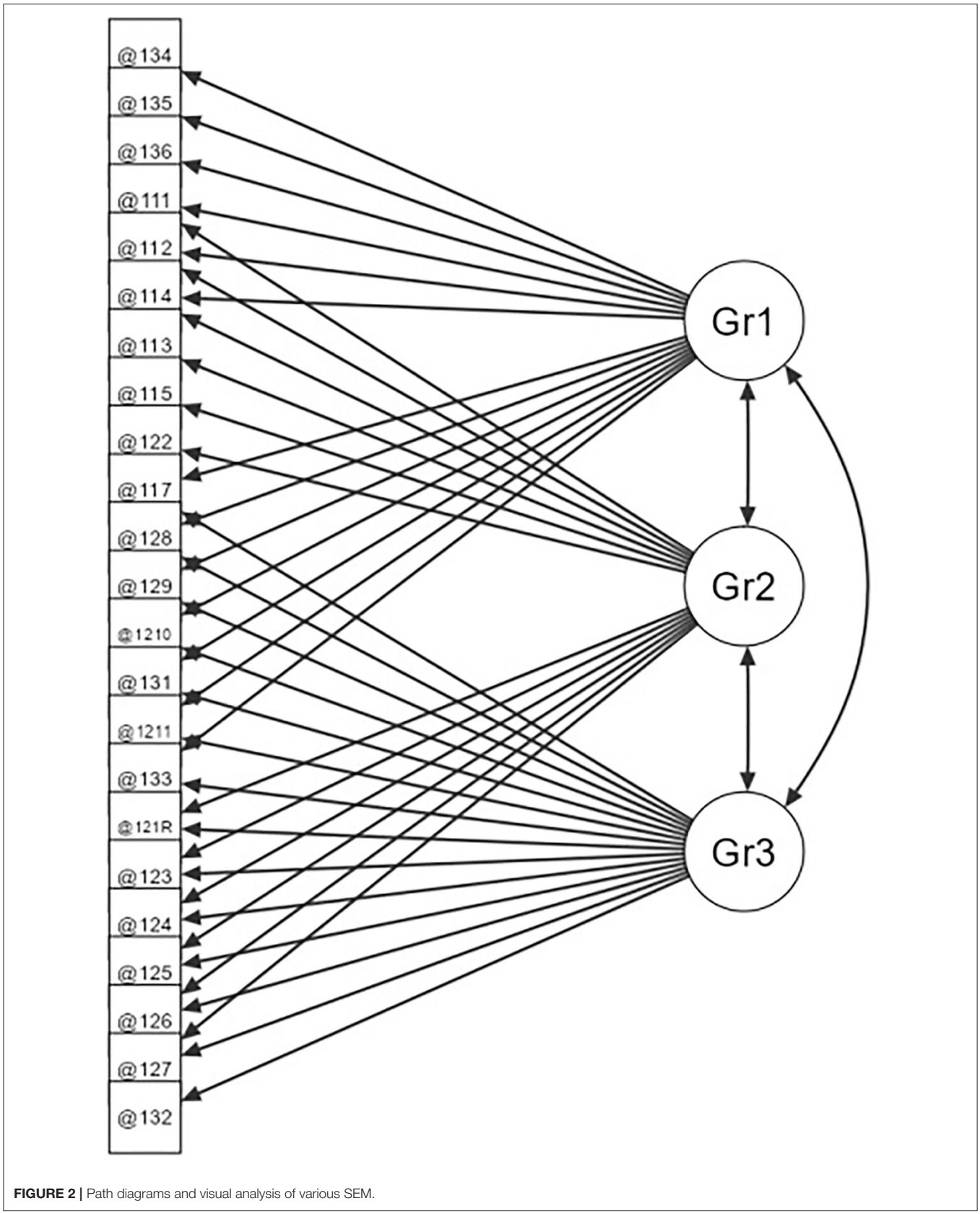

FIGURE 2 | Path diagrams and visual analysis of various SEM.

the independent variables to explain the variability of the dependent variables.

DISCUSSIONS AND CONCLUSIONS

The research provides an extremely positive instrument of psychometric quality for the detection and assessment of the training needs of in-service secondary education teachers, with an adequate degree of reliability and validity. The questionnaire has good internal consistency and the factor analyses carried out indicate that the data fit the model well, also corresponding with key analytical dimensions in the field of the teaching of the social sciences (Miralles et al., 2019; Parra and Fuertes, 2019; Gómez-Carrasco et al., 2022).

As for the factors and response groups of the in-service teachers established in the research, there is still a group of teachers who, despite showing an interest in training in digital resources and innovative methodologies, continue to prefer other teaching resources. With regard to teachers undergoing their initial training, Chaparro et al. (2021) and Chaparro and Felices de la Fuente (2019) found divergencies in positioning in relation to resources, with digital resources on the one hand and those relating to heritage and the use of sources on the other.

Similar results were also found by Miralles-Martínez et al. (2020) and Sánchez-Ibáñez et al. (2021) in two studies on the in-service training needs of teachers in the field of secondary social sciences. Specifically, the results of these studies demonstrated that teachers attribute a high level of priority to training on different types of resources such as heritage, cinema, museums, and artistic productions, in addition to training on other digital resources such as mobile applications, geolocation devices and the creation of videos and digital printing, although some such resources, such as videogames and augmented reality, obtained a lower evaluation. These results also coincide with those of Guerrero-Romera et al. (2021) on the importance and relevance attributed by teachers to these types of resources, although they are not always those which are most used for teaching (Cuenca, 2009; Cózar-Gutiérrez and Sáez-López, 2016; Gómez et al., 2016; Roblizo et al., 2016; Gómez and Miralles, 2017; Chaparro and Felices de la Fuente, 2019).

This is particularly important if it is taken into account that the use of certain resources is associated with approaches and methodologies which are more student-centered and those in which the teaching strategies and resources serve to achieve learning which is more comprehensive and critical of History (Gómez and Miralles, 2017; Landers and Armstrong, 2017; Özdener, 2018; Sánchez Ibáñez et al., 2020; Guerrero-Romera et al., 2021). However, a change can be perceived even if it does not affect all teachers in equal measure as some demonstrate an interest in training in more traditional teaching resources and do not express an interest in being trained in active methodologies or have a moderate level of interest in digital resources.

The previous studies on the teaching profiles of primary and secondary education teachers reveal that although progress is being made from a traditional profile to a more innovative approach that occasionally puts active learning strategies and methodologies into practice, the presence of teachers with a critical attitude who problematize contents, prioritize the teaching of historical processes, and encourage the learning of the scientific method in the social sciences is still extremely low (Estepa, 2012; Sant et al., 2015). Furthermore, there are numerous studies in which the predominant use of traditional practices by secondary education teachers in history education is observed (Martínez et al., 2006; Molina and Muñoz, 2016; Gómez-Carrasco et al., 2018). In relation to pre-service secondary education teachers, Dejene et al. (2018) found that they place greater emphasis on a traditional teaching approach which is more focused on the teacher than on student learning.

A recent study by Miralles et al. (2019) on pre-service teachers also showed that there is no single continuous dichotomy between traditional and innovative processes and it is possible to observe individuals who prefer innovative proposals but do not, for this reason, reject traditional processes. Indeed, they may even show that the higher they evaluate the use of digital resources, the lower their preference for the use of traditional procedures. In addition, these authors noted that there is a clear correlation between the evaluation of innovative methodological processes and the evaluation of certain resources such as videogames in the history classroom. This has been confirmed in other international studies on gamification, which have demonstrated the close relationship between the use of video games in the classroom and an increase and stimulus of innovation in teacher training (Landers and Armstrong, 2017; Özdener, 2018). Buzo (2014) and De la Calle (2015) stated that digital resources can contribute toward achieving a real change with regard to teaching methodology in the social sciences. The majority of these studies propose teacher training as a tool for achieving a skills-based model of History education employing active learning methods (Gómez and Miralles, 2016).

To conclude, the ongoing teacher training is a key element for introducing in-service teachers to new models of social sciences education (Ramírez, 2015). Indeed, in Spain, the new education law (LOMLOE) and the secondary education curriculum express (RD 217/2022) the need to adapt the education system to the emerging demands of society and education and emphasize active learning methods which foster student learning and the development of key skills as potentially favorable strategies for improving the quality of education in all areas of knowledge, including the social sciences. This adaptation of the education system to a skills-based approach requires ongoing teacher training, which is a key to facilitating teaching innovation in the classroom, both in compulsory secondary education and baccalaureate education.

The creation of this instrument makes it possible to identify the training needs of in-service teachers in the area of social sciences at the secondary level and provides new keys to improving training processes. However, it is necessary to continue making progress in terms of statistical correlation with a larger sample size and the use of other qualitative data collection tools or a mixed-methods approach which would make it possible to explore other competencies and examine teachers' motivations and the reasons for the results obtained in more depth. As far

as the implications of this study are concerned and with a more prospective vision, some ideas which could help to improve and enrich the results of this research could be: incorporating some of the needs identified by the teachers and originating from the demands of their professional activity into the training process and encouraging similar research in other national and international contexts with the aim of increasing the sample and comparing results.

This research can contribute toward analyzing the extent to which in-service secondary education teachers value training needs relating to innovative teaching proposals from the principles closest to those defended by the new teaching models, from a more practical perspective, taking the needs identified by the teachers as a basis and, above all, to identify and reflect upon the different teaching profiles.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

Ethical review/approval and written informed consent were not required for the study on human participants in accordance with the local legislation and institutional requirements.

AUTHOR CONTRIBUTIONS

Conceptualization, writing of the manuscript, review and editing, and supervision: CG-R. Methodology and analysis: CG-R and AP-O. Both authors contributed to the article and approved the submitted version.

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