Intergenerational Learning Among Teachers' Professional Development and Lifelong Learning: An Integrative Review of Primary Research

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Abstract: This integrative literature review aims to provide a broader and updated perspective of teachers' intergenerational learning (IL). The search was done in Web of Science and EBSCO ultimate databases between 2011 and 2022. Thirty-two empirical studies were selected and submitted to a thematic analysis and five themes were identified: (a) defining and conceptualising generation, (b) IL from understandings to practices, (c) contexts, factors and roles from different generations and institutions to promote IL, (d) factors that facilitate the success of IL, and (e) factors that make IL difficult. Data shows an increase in the last decades of research in IL within the educational context, but an absence of the prospective dimension still prevails. Intergenerational knowledge has been researched mainly from an individual professional perspective at the micro and meso levels of scholarship. Effectiveness requires intentional cultivation and a genuine desire for intergenerational knowledge exchange, involving active engagement and awareness among diverse generations and alignment with organizational aims. The promotion of IL takes place in very different ways and forms, and reflection on what is different seems to be a dominant trait. Furthermore, the review could conclude that intergenerational opportunities to work together will improve teacher education and continuous professional development.

Keywords: *Generations, learning, professional development, review, teacher education.*

Introduction

The societal transformations witnessed in recent decades in structuring areas of society, namely in the educational sector, are multiple and complex. The Council of the European Union (2020), in the "Council conclusions on European teachers and trainers for the future", warns that the teaching profession increasingly faces more demands, responsibilities and expectations. One of the demands is the worldwide demographic changes, such as increased retirement rates and high teacher dropout levels that increase the generational gap among schoolteachers. In Portugal, the problem is very sharp considering the aged teaching staff and the fact that in 2019, the perspective was that 50% of teachers would retire over the next ten years (Organisation for Economic Co-operation and Development [OECD], 2019).

Lyons et al. (2019) conceptualised generation as a workplace phenomenon instead of reducing it to a mere demographic variable. In this understanding, and according to Kupperschmidt (2000), generations are defined by the year of birth, available economic prospects, and significant shared life experiences among a specific group of people. At the workplace, generational diversity influences workers' identities and allows learning among generations. Leon (2023), in a systematic review on human resources (HR), highlights that organisations fostering connections between generations generate added value at both individual and organizational levels. This fosters the development of individual competencies, sustains and evolves societal values, facilitates social and economic exchanges, and promotes productive cultural assimilation. Ricciardi et al. (2021) and Tortorella et al. (2021) reinforce this understanding when state wherein learning is portrayed as a multi-level process instigating transformations in beliefs, knowledge, and behavior across individual, team, and organizational dimensions. Therefore, IL appears as an organisational process that creates a bridge between generations and generates added value at the individual and organisational levels (Räisänen et al., 2014).

Within this framework, IL establishes a positive connection with initial teacher education and significant continuous professional development. However, managing the diversity among generations of schoolteachers is expected to remain

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a persistent challenge for an extended period. It needs to include knowledge systematization of what the research already highlights. Indeed, the intergenerational approach, namely in teacher education and professional development, has been neglected, leaving the policymakers without a clear solution for the ageing society phenomenon (Kupperschmidt, 2000; Ricciardi et al., 2021).

Raising from a project that aims to contribute to the study of teachers and educational change (social, curricular and political) within the context of increasing teaching staff ageing, associated with the absence of its renewal and the loss of attractiveness of the profession, this research will contribute to emphasize interactions between generations of teachers and deep intergenerational dialogues in teaching.

Hence, considering the notion that organizations, including schools, ought to endorse the integration of innovative approaches to knowledge management and create environments conducive to enhancing intergenerational learning (European Centre for the Development of Vocational Training, 2012), this integrative review aims to provide a broader and updated perspective of IL within the educational setting context. The intent is to inform and consider future IL in teacher education and development. Having this in consideration, this revision tries to answer the following research questions:

1. What are the understandings of IL among teachers?

2. What contexts, factors and roles from different generations and institutions are identified as promoters of IL among teachers?

Methodology

This review followed the procedures of an integrative literature review that, like the systematic review, uses an orderly process to identify, analyse, appraise, and synthesise the selected studies but does not use statistical synthesis methods (Whittemore et al., 2014). Moreover, it employs a wide-ranging methodology and varied sampling methods, encompassing empirical or theoretical literature or both (Cooper, 1984). Consistent with this review's purpose and research questions, the integrative approach fosters a comprehensive exploration encompassing concept definition, theory testing, and methodological analysis supporting a broad inquiry range (Toronto, 2020).

Empirical literature selected for this review (results were synthesised) suits the research purpose through the stepwise approach that encompasses: (a) formulating search terms, (b) selection databases, (c) conducting the search, (d) application of inclusion criteria to select the relevant literature, and (e) data extraction.

The definition of search keywords and criteria for searching relevant databases centered on identifying the most pertinent findings associated with student teachers and different teachers' generations focused on intergenerational learning between 2011 and 2022. The authors believed it was timely to review this interim period, given the rising number of international collaborative projects and networks funded by the EU since then (European Network in Intergenerational Learning; Generations in Actions – the role of intergenerational learning in active ageing (GO-ACT); Promoting Active Learning and Ageing of Disadvantaged Seniors (PALADIN) ADDing quality to life through inter-generational learning via universities (ADD-LIFE).

Procedure

Two researchers independently searched two databases: Web of Science in the category 'education educational research', Scopus on the subject 'social science', and EBSCO ultimate in the fields Title, Abstract and keywords, using the search criteria: "learning" AND "intergenerational" AND "teachers". These databases were chosen since they host a majority of the prominent publishers of scientific journals and encompass globally relevant repositories crucial for educational research.

The review's eligibility required empirical studies in open access, full text, written in languages understood by the authors (English, Portuguese, French, or Spanish), published in peer-reviewed academic journals, and limited to 2011 to 2022. The studies need to be convincingly connected dialogues, communication or learning among teachers or student teachers from different generations.

Two of the authors independently retrieved studies provided by database searches in July 2022 to ensure consensus on relevant articles and identified a total of 1306 studies. After removing 277 duplicates, 1029 studies remained.

Attending to Torraco's (2005) staged approach, at the first stage, the abstracts from the 1029 studies were scrutinized by the same two authors. When the studies did not focus on teachers, they were eliminated (928). Studies lacking adequate depth or failing to address the fundamental aspects related to the research questions were excluded (28). Each author individually identified which articles were relevant to the review before comparing results across the two authors and considering any discrepancies. A third author confirmed the selection. The subsequent phase entailed reading the 32 remaining studies incorporated into the review. The process of selecting references for review and the inclusion of earlier studies is outlined in Figure 1.
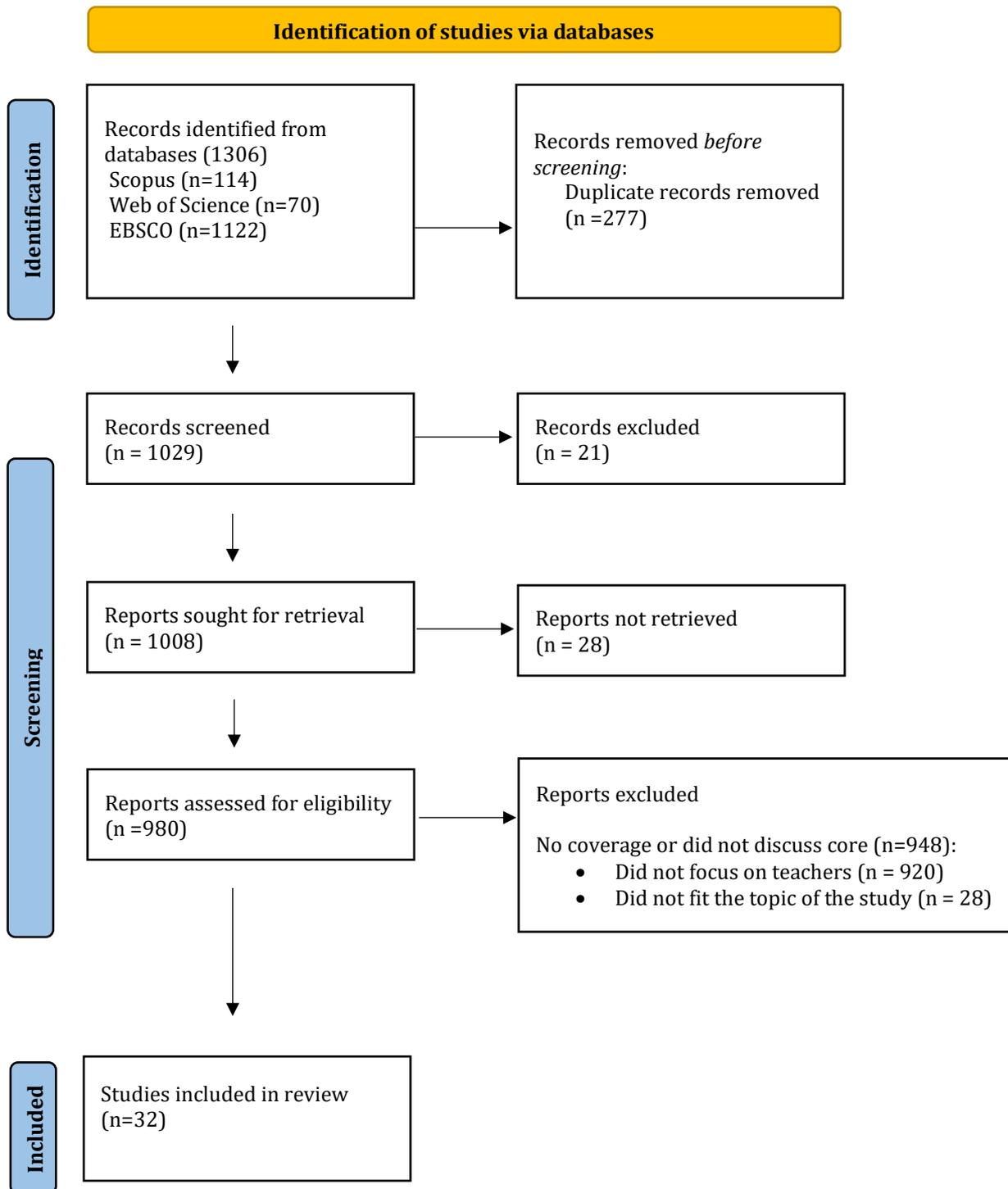
Identification of studies via databases

Identification

Records identified from
databases (1306)
Scopus (n=114)
Web of Science (n=70)
EBSCO (n=1122)

→

Records removed *before
screening*:
Duplicate records removed
(n =277)

Screening

Records screened
(n = 1029)

→

Records excluded
(n = 21)

Reports sought for retrieval
(n = 1008)

→

Reports not retrieved
(n = 28)

Reports assessed for eligibility
(n =980)

→

Reports excluded

No coverage or did not discuss core (n=948):
- Did not focus on teachers (n = 920)
- Did not fit the topic of the study (n = 28)

Included

Studies included in review
(n=32)

Figure 1. Flow Diagram Reporting Searches of Databases Adapted from Page et al. (2021)

Data Extraction and Data Analysis

The 32 studies were inserted in the NVivo20 and examined through an inductive thematic analysis (Braun & Clarke, 2012), highlighted by the aim of the study and research questions. The thematic analysis involved four steps: (a) Carefully reading each article to capture its theoretical underpinnings, findings, and conclusions; (b) Compiling the identified topics per section of each article; (c) Assigning preliminary codes to label the sections of each article before organizing them into broader general topics; and (d) Organising the generic topics into themes attending to the aim of the study and research questions. After coding each article, the initial codes (for example, studies aim, methods, types and definition of generations, learnings between generations, practices of IL; difficulties in IL, empowerment by IL) were iteratively progressively clustered into broader topics through iterative discussions among the authors, leading to the identification of the following themes: (a) Defining and conceptualising generation, (b) Intergenerational learning from understandings

to practices, (c) Contexts, factors and roles from different generations and institutions to promote IL, (d) Factors that facilitate the success of intergenerational learning, and (e) Factors that contraints IL.

Additionally, each study's methodology was analysed concerning the context, design study, data collection and participants.

Results

Descriptive Overview

The 32 articles were published in 28 different Journals, with the Journal of Intergenerational Relationships (three), the European Journal of Teacher Education and Studia Paedagogica (two each) being the most common. The other journals only have a study each.

The authors list included 23 different first authors, with the authors who published most frequently in the field of interest accounting for almost half of the published articles (fifteen): Brücknerová and Novotný in co-authored, Geeraerts and Polat with other co-authors, with five papers each.

Regarding the number of articles published, there was a decrease between 2011 and 2014 and an increase after 2015, between three and five papers per year, except in 2019, with only two articles. 2018 and 2021 stand out, with five articles published each year (Figure 1).
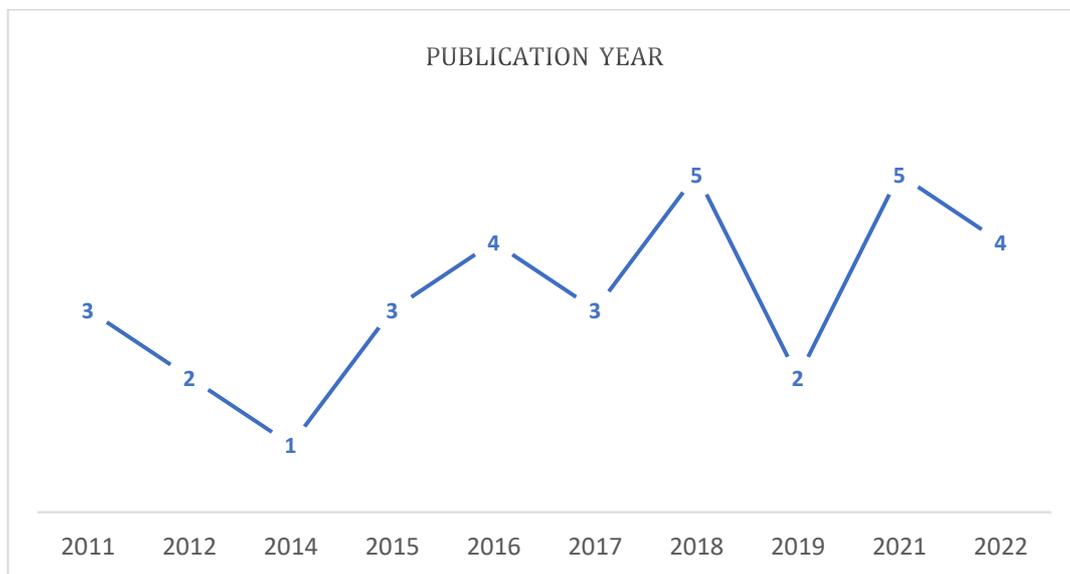

Figure 1. Articles Published by Year

The studies were conducted in fifteen different countries: Five in Czechia (Brücknerová & Novotný, 2015, 2017a, 2017b; Novotný & Brücknerová, 2014, 2016), Turkey (Çelik & Polat, 2022; Kazak & Polat, 2018; Polat, Çelik & Okçu, 2019; Polat & Kazak, 2015) and the United States (Anthony-Stevens et al., 2022; Gray et al., 2021; Loder-Jackson, 2011, 2012; Philip et al., 2022), three in Belgium (Geeraerts et al., 2016, 2021; Geeraerts, Vanhoof & Van den Bossche, 2018), and Australia (Diamond & Bulfin, 2021; Pardy & Reimer, 2018; Santoro et al., 2012). A study was conducted in Belgium and Finland (Geeraerts, Tynjälä & Heikkinen, 2018), and the other countries had one study each.

All 32 studies are empirical, of which 24 are qualitative, and most used a combination of data collection tools, with individual and group interviews being the most common. Participant observation is also an instrument used recurrently in combination with board diaries. Writing stimulations and participatory dialogues also were used as data collection tools. The remaining eight studies are quantitative and use questionnaires for data collecting. Novice to experienced school teachers from different levels (kindergarten, primary school, elementary school, or high school) and other roles (mentors, head teachers) are the participants in most studies. Teacher educators, student teachers, school principals and administrators also participate in some studies.

The theoretical framework of the articles focuses mainly on intergenerational (31) and generational (21) issues, autonomous or connected. The topics that appear in intergenerational issues are numerous and diverse, with intergenerational learning (23), intergenerational knowledge (11), and intergenerational interaction (12) appearing most frequently. The articles focus on the generation topic; the emphasis is on the definition of generation (18), the Baby Boomer generation (5), generation X (16) and generation Y (11).

Two other elements that emerge from the analysis of the articles are the connection of these themes to learning in different configurations and spaces, such as learning communities (13), informal learning (10), learning interaction (9),

learning environment (8) and learning relationship (8); the other element found was knowledge, specifically professional knowledge, knowledge management (10) and knowledge sharing (9).

Appendix 1 displays the data from each study that will be explored in the identified themes: (a) Defining and conceptualizing generation, (b) IL from understandings to practices, (c) Contexts, factors and roles from different generations and institutions to promote IL, (d) Factors that facilitate the success of IL, and (e) Factors that constraints IL.

Defining and Conceptualising Generation

In this literature review study about the empirical research focused on intergenerational relationships (interaction; learning) among teachers in schools, it is crucial to ask in what sense and degree the concept of generation is explained or questioned by the authors of the selected papers. Only a few more than half of the papers assumed those concerns explicitly [18/32]. The familial perspective of generation (family roles) is mentioned by some authors as an alternative definition much used in intergenerational programs in the school context, but this is not considered particularly suitable to distinguish teachers and to study the relationships among them (Akcil et al., 2018; Brücknerová & Novotný, 2017a; Geeraerts, Vanhoof et al., 2018; Novotný & Brücknerová, 2014; Polat & Kazak, 2015).

Inspecting all the bibliographic references presented in the selected articles, Mannheim (1952) came up as the most quoted author (12/32) with the book "Essays on the sociology of knowledge", or its specific chapter "The problem of generations". Synthetically, Mannheim (1952) appears as the first reference, precursor, or ancestor of the generational conceptual framework adopted in these articles, connecting the typical characteristics of age-cohort members (similar birth periods) with mutual social experiences and shared historical events during their lifespan.

Loder-Jackson (2011, 2012), an African American Educational Researcher, takes up Mannheim's articulation of the problem of generations focusing on the watershed in the life course of "African Americans born on opposite sides of the civil rights movement confronted vastly divergent opportunities and constraints for "what [they] could be and do" (Loder-Jackson, 2011, p. 157). The author alluded to Mannheim in distinguishing intracohort social and historical location due to variables (faultlines) like race, class, gender, and regional area. This framework proved valuable in exploring the intergenerational dynamics among African Americans born before and after the civil rights movement.

Demographic research on Black "Baby Boomers" indicates that this generation, born between 1946 and 1964, grew up in a world of segregation and racism yet had more opportunities for formal schooling than did its parents' generation, the Great Generation [American Demographics 2001]. African Americans born between 1965 and 1984 are categorized by the monikers Generation X and hip-hop generation, being the most conservative political and economic eras in recent history. Coming of age in an era of ambivalent opportunities, the hip-hop generation is the first generation of African Americans who are more fully "enjoying the fruits of the civil rights and black power movements", yet they are also experiencing the "reversal of civil rights gains" (Kitwana, 2002, as cited in Loder-Jackson, 2011, pp. 157-158)

A Turkish research team used the labels Baby Boomer, Generation X and Generation Y as a critical concept or a general reference for their studies. Polat, Çelik and Okçu (2019) examined the perspectives of Turkish school administrators on teachers from different generations through a SWOT analysis. Based on several authors (e.g., Hart, 2006; Smola & Sutton, 2002) and particularly on Hernaus and Pološki Vokic's (2014) table of work values and preferences attached to these generation labels, the authors take the labels Baby Boomers, Generation X and Generation Y as the primary reference and basis for the inquiry guide. In a related study, Polat, Okçu and Çelik (2019) used and established identical generational categories to explore school administrators' perspectives on enhancing intergenerational learning, collaboration, and solidarity among Baby Boomers, Generation X, and Generation Y. In another study, Çelik and Polat (2022) used the same classic labels to distinguish general views about teacher generations in a descriptive and correlational study based on intergenerational knowledge-sharing and intergenerational learning scales. The authors described the heterogeneity of the sample by generations, years of teaching experience, and years of service at them; however, they analysed the data as a whole sample. In a similar multiscale study (leadership; intergenerational atmosphere; and intergenerational learning), Kazak and Polat (2018) also described the sample's composition by the three classical generations' labels but did not introduce it in another section. In a qualitative study comparing primary teachers with less than ten and more than 25 years of experience regarding their views of intergenerational learning, Polat and Kazak (2015) discussed their results bearing resemblance with European and American features of Generation X and Generation Y professionals.

Authors from other countries also reported the classical generations' labels or alternative names. Geeraerts, Tynjälä and Heikkinen (2018), and Geeraerts et al. (2016, 2017, 2021) highlighted the statement of Edge (2014) about the chronological approach and the specification of the boundaries of three teachers' generations based on birth year: Baby Boomers (1946–1965), Generation X (1966–1980) and Generation Y (1981–2003). However, these authors differ from the Turkish research team regarding prototypical features and generation labels. For instance, Geeraerts et al. (2016) sustain that empirical evidence of research literature contradicts the messages of popular press about particularities and differences between generations but also remains quite contradictory regarding the differences and similarities between and within generations. Even so, the authors remark on the potential influence of popular literature in shaping and diffusing stereotypes. Operationally, Geeraerts and collaborators study teachers' cohort generations, replacing the classical labels with age-based denominations (young, middle, and old).

Working on their definition of generations, Novotný and Brücknerová (2014) reported that the Czech Republic historical context is incompatible with the prototypical features of the Western generations of Baby Boomers, Generation X and Generation Y.

These Czech researchers (Brücknerová & Novotný, 2015, 2017a; Novotný & Brücknerová, 2014) associate their definition of generation to a multilevel phenomenon, crossing age cohort with work experience, professional career position, and self-perception of being a member of a particular generation:

> Key factors influencing how generations are defined in the context of professional relations include not only age (i.e. specific age cohort membership) but also work experience [Tempest 2003]. Based on this factor, we view as desirable not to limit the definition of teacher generation to age only but to include the professional career development phase as a factor (Brücknerová & Novotný, 2017a, p. 398).

Generations are inherently age-based but not biologically completed. Even so, several authors (Geeraerts et al., 2017; Novotný & Brücknerová, 2014) reported a lot of inconsistencies in research literature concerning the features and labels of generation cohorts and their respective boundaries.

> We would argue that the conceptualisation of generations and operationalization of generations of teachers needs further elaboration. For instance, future research might focus on the relevance of age boundaries of generational cohorts or reveal whether there exists a linear effect of age? (Geeraerts et al., 2017, p. 94)

The degree of expertise in the profession, inherently associated with the years of professional experience, and the status within the team staff justified the division either of young or middle-aged cohorts in similar ages novice and expert generations (Brücknerová & Novotný, 2017a; Geeraerts et al., 2017).

The generation concept is a multidimensional construct that depends on the context (D. Ropes & Ypsilanti, 2016). Defining generational cohorts poses a challenge due to the necessity for consensus regarding the boundaries of each cohort (Lyons et al., 2019; D. Ropes & Ypsilanti, 2012).

One concern pointed out by Geeraerts in several of her and her collaborators' intergenerational studies resides in the delimitation and use of age cohort as a demographic variable instead of embedding generation as a workplace phenomenon. For instance, about the insertion of professional experience or tenure in a school, they say:

> We did not include years of experience since this variable was too highly correlated with our age variable, which might cause problems of multicollinearity. (…) In this study, our generational cohorts are diverse. For instance, the youngest cohort includes both inexperienced teachers in their induction phase and teachers with 10 years of experience. This division has not been included in this study, but potentially offers an important perspective to further unravel the complexity of teacher generations. (Geeraerts et al., 2017, p. 94)

In this study, we used a chronological definition of generation.

> However, an experienced teacher moving to a new school or department may feel like a 'novice', whereas a younger teacher may have considerably more experience within a specific context or knowledge domain. Further studies should therefore take into account the number of years of experience within the school. (Geeraerts, Tynjälä & Heikkinen, 2018, p. 492)

Brennan and Clarke (2011) adopted a reconceptualised notion of generation, reframing the age assortment of generations with a continuum of knowledge base generations. They consider recent graduates recruited for teacher education as a distinct generation between the generations of experienced teacher educators and pre-service teachers. This intermediate generation represents "a group with unutilised or underutilised knowledge that has the potential to contribute substantially to teacher education in a manner that would benefit all involved in the interaction" (Brennan & Clarke, 2011, p. 128).

In summary, Mannheim's (1952) conceptualization of generation connects typical characteristics of age-cohort members with shared social experiences. Kazak and Polat (2018) present a distinct approach by refraining from separating generation labels. Conversely, Geeraerts and collaborators adopt the chronological method (Baby Boomers, Generation X, and Generation Y) but replace classical labels with age-based denominations (young, middle, and old). D. Ropes and Ypsilanti (2016) perceive generations as a multidimensional construct, where the specific dimensions and their significance may vary depending on the context. Lastly, Brennan and Clarke (2011) reconceptualize generations by introducing a unique knowledge base generation specifically for recent teacher education graduates.

Intergenerational Learning From Understandings to Practices

In most of the reviewed articles, which report on studies carried out in several countries, intergenerational learning is interpreted as a force in progress in the current scenario of demographic ageing; actually, a vital force in bridging the intergenerational gap at the level of the whole society and maintaining the organizational knowledge at the level of companies and institutions (Brücknerová & Novotný, 2015). Intergenerational learning is interpreted as favouring the most complex sociocultural transformations of the 21st century by exchanging best practices, creating group cohesion,

providing learning with each other, learning together and learning about the generations themselves, allowing the understanding of how they all are.

Polat and Kazak (2015), Geeraerts et al. (2016), and Geeraerts, Tynjälä and Heikkinen (2018) use the same definition of intergenerational learning made by D. Ropes (2013, p. 714): "Intergenerational learning is defined here as an interactive process that takes place between different generations resulting in the acquisition of new knowledge, skills and values".

Combining the ideas of Ropes, Novotný and Brücknerová, Geeraerts and collaborators complemented the definition of IL:

> IL has been described as a valuable process for competence building and knowledge retention in different disciplines such as sociology, education and organizational learning (D. C. Ropes, 2011). IL is conceptualized as an interactive process between groups of people from different generations, through which one or both parties learn (Novotný & Brücknerová, 2014; D. C. Ropes, 2011) (...) Intergenerational relationships and interactions therefore support IL. (p. 480)

Several authors associate Intergenerational learning with a form of lifelong learning (Geeraerts, Tynjälä & Heikkinen, 2018; Geeraerts et al., 2016; Kiviniemi et al., 2021; Polat, Çelik & Okçu, 2019; Polat & Kazak, 2015; Sindic et al., 2022). In this matter, Polat and Kazak (2015) underscored the transfer of tacit knowledge between generations. It is essentially informal, and although it can be planned, most is unplanned and self-directed, always allowing mutual enrichment.

Polat, Okçu and Çelik (2019) refer to intergenerational learning in the organizational structure as a form of collaborative social learning that can be developed differently. On the other hand, they mention that it facilitates organizational capacity, increasing the level of knowledge and skills of employees and promoting the creation of new knowledge and the development of organizational processes.

Situating the issue in the teacher professional development, Geeraerts, Tynjälä and Heikkinen (2018) place intergenerational learning in the context of teachers' teams as a facilitator of knowledge sharing among different teachers' generations. The authors make no distinction between formal and informal learning but focus on the "what" and "how" teachers learn from each other, younger and older. The "what" categories adopt Shulman (1987) and Kyndt et al. (2016) models of teacher knowledge, attitudes and professional identity, and the "how" categories intend to gather learning that takes place through discussion and collaboration, sharing information, knowledge and experiences, giving and receiving advice and help, observation, reflection, imitation and adjustment of practices. Intergenerational learning is supported by a positive school climate, with friendship, trust, and respect. The authors advocate the importance of stimulating relationships and interactions between different generations of teachers, inside and outside the school, and also remark on the value of bi-directionality in learning interactions between younger and older teachers.

Geeraerts, Tynjälä and Heikkinen (2018) call special attention to the importance of Principals being attentive to developing a community of teachers embodied by psychological safety. Intergenerational learning is enhanced if an intergenerational atmosphere is created in the school. In this sense, Kazak and Polat (2018) argue that school principals need to create a supportive atmosphere, effectively eliminating prejudice against older generations and creating the perception that there is much to learn from other generations. The importance of the role of principals, school leaders or administrators in promoting intergenerational learning was conveyed by several more authors (Akcil et al., 2018; Çelik & Polat, 2022; Geeraerts et al., 2016, 2017, 2021; Klein & Shapira-Lishchinsky, 2016; Pardy & Reimer, 2018; Polat, Çelik & Okçu, 2019; Polat & Kazak, 2015; Polat, Okçu & Çelik, 2019).

Pardy and Reimer (2018) elucidate that teaching work is, by nature, intergenerational, where one generation teaches the other. In this process, knowledge flows between them, contributing to constructing meaning about teaching and being a teacher. The authors assume that intergenerational learning is fundamental in promoting permanent respect for the teaching profession, valued by "being together between generations" (p. 119)

Almost all the reviewed papers headed by Geeraerts put forward the connection between knowledge management and intergenerational learning concepts. As Geeraerts et al. (2016, p.50) state: "In order to cope with the growing trend of age diversity in teams, organizations need to support the implementation of new dimensions of knowledge management and conditions that improve intergenerational learning". Geeraerts et al. (2017) incorporate intergenerational learning as a school knowledge management process. They refer to it as a strength of the organizational context to encourage innovative practices and inhibit the loss of knowledge in school teams.

Geeraerts et al. (2016) highlight the interactive process that converges into three themes: teachers' knowledge, skills, and attitudes. It is a sharing that takes place through beneficial activities, with the interest of contributing to the development of more harmonious, democratic and inclusive societies and developing respect, understanding between generations and more cohesive communities. Intergenerational learning favours the establishment of links between generations and a better understanding of the issues that affect different generations.

Rojas (2015) elevates the intergenerational encounter to enhance the development of professional awareness, both for novice and experienced teachers. Brennan and Clarke (2011) mention that the introduction of recent graduates as teacher educators further a Jared phenomenon, a particular case of intergenerational learning, which complements the

classical interaction between old timers (experienced teacher educators) and newcomers (student teachers). The authors argue that intergenerational learning should not be confined to intergenerational interaction between age extremes. They justify it with Smith and Yeager's (1999) example of teenage mothers as visiting speakers in high school health classes. The reconceptualization of generation from age-based to knowledge-based and the introduction of recent graduates constitute an essential step forward in reflecting on intergenerational learning, and a significant contribution to benefit from an underutilized resource in teacher training. In the articles analysed, there is a growing recognition that the intergenerational learning process involves interaction between different generations, with specific narratives and life circumstances, which outline ways of life and professional practices that can be analysed through different approaches and perspectives supported by research. This scenario confronts us with complex and debatable issues that challenge, at various levels, policies, practices, leadership and research in this area.

The Czech researchers (Brücknerová & Novotný, 2015, 2017a; Novotný & Brücknerová, 2014) focus on the circularity of the intergenerational learning in an interaction between teachers and the learning content linked to the teaching profession. The authors discuss possible approaches for creating the intergenerational learning typology and a specific typology that organizes four types of intergenerational learning: receiving, transforming, seeking and inspiring (Brücknerová & Novotný, 2015).

For Brücknerová and Novotný (2017a), to clarify the concept of learning within the domain of intergenerational learning is crucial in order to be able to work with it. However, they consider the difficulty in discerning real learning in the day-to-day life of a workplace. They resort to the learning theory proposed by Illeris (2007), which states the high usefulness of permanent capacity change. "The theory enables us to use given criteria to decide whether learning has occurred or not in the specific situation which has been reflected upon by the teacher" (Brücknerová & Novotný, 2017a, p. 399). Following this theory, capacity change can be configured by three dimensions: content, incentive and interaction. However, finding an answer to what people learn from each other is not simple. Based on Eraut (2007), the authors highlight that this complexity comes from the fact that the development of professional knowledge - learning from one another in the workplace - has a relevant implicit component.

A general view that runs through most of the analysed articles is that intergenerational learning emerges as a process of interaction between teachers. It is important in the sharing of knowledge between generations, and it is a relevant way to benefit from generational diversity, for which, according to Geeraerts, Vanhoof et al. (2018), it is necessary to know how to identify who is interacting with whom and what the interaction is about:

> In order to benefit from generational diversity, intergenerational learning is relevant and can be obtained by knowledge sharing between different generations of teachers asking advice and information interactions between teachers of different generations potentially result in intergenerational knowledge flows. In order to investigate intergenerational knowledge flows through advice and information seeking interactions, it is needed to capture first "who" is interacting with whom, and second "what" is the interaction about. (pp.256-257)

Intergenerational learning places teachers in a positive action plan in the profession; they learn from experience and reflection on practice, in a circular interaction between teachers, generating autonomous dynamics of professional development, in a space-time of growing professional demands (Gray et al., 2021). It emerges as a way to restore the teachers' confidence as they practice their profession, provided by the recognition that comes from the interaction between teachers of different generations, making the knowledge and skills of teachers an added value for others (Geeraerts et al., 2016).

The discussion that supports the articles analysed, with a greater incidence in those published between 2014 and 2022, places intergenerational relationships as potentiators of intergenerational learning that transform knowledge, whether to support being a teacher or pedagogical practice, generating positive dynamics between teacher education and teacher training.

In this context of problematizing the meanings attributed to intergenerational learning, a variety of expressions emerge that configure different meanings, such as: interaction, cooperation, collaboration, professional development, organizational development, dialogue, communication, learning together, elimination of prejudice and conflicts, which in our view elevate IL to a global approach. It is a global approach that can work for the benefit of initial and continuing teacher training in building the teaching profession and quality of practices and facilitating organizational development. It is an approach capable of generating attractiveness in the teaching profession, constituting a process of recognition and strengthening the importance of the teaching profession, thus contributing to the qualification and motivation of teachers.

In short, generational relationships configure a political, social, cultural andeducational dimension, characterized by questioning and co-creation, which attribute meanings to intergenerational learning connected with lifelong learning, with the democratization of educational practices that lead to transformative knowledge, which are positioned beyond an idea of ageism. It involves participation and positive/inclusive conviviality, strengthened by reciprocal experiences that generate well-being with a multidimensional character. It is developed within or outside the group as collaborative, in addition to the subjects. It implies interaction and critical involvement of those involved, it broadens the experiential

field. It requires conditions for commitment and the construction of trust, communication spaces that facilitate dialogue and sharing; it moves from an individualistic vision to collective work processes and promotes professional development (from learning together, from each other, and understanding how to learn from others).

Contexts, Factors and Roles From Different Generations and Institutions to Promote Intergenerational Learning

The analysis of the 32 papers used in this literature review allowed to identify the broad contexts where intergenerational learning occurred and was researched: the initial teacher education and the formal and informal teacher training. Table 1 shows a larger view of papers distribution in these teacher training categories, complemented by an out-of-training category.

Table 1. Contexts of Teachers' IL

Teacher Education	Formal/Informal Teacher Training	Bordering Teacher Training
Brennan and Clarke (2011)	Brücknerová and Novotný (2017a)	Geeraerts et al. (2021)
Gray et al. (2021)	Novotný and Brücknerová (2014)	Klein and Shapira-Lishchinsky (2016)
Pardy and Reimer (2018)	Brücknerová and Novotný (2015)	Çelik and Polat (2022)
Pinazo-Hernandis et al. (2016)	Brücknerová and Novotný (2017b)	Diamond and Bulfin (2021)
Santoro et al. (2012)	Novotný and Brücknerová (2016)	Loder-Jackson (2011)
Kiviniemi et al. (2021)	Geeraerts, Tynjälä and Heikkinen (2018)	Loder-Jackson (2012)
Philip et al. (2022)	Geeraerts et al. (2017)	Pitfield et al. (2023)
Anthony-Stevens et al. (2022)	Geeraerts et al. (2016)	
	Geeraerts, Vanhoof et al. (2018)	
	Kazak and Polat (2018)	
	Polat and Kazak (2015)	
	Polat, Çelik and Okçu (2019)	
	Polat, Okçu and Çelik (2019)	
	Akcil et al. (2018)	
	Kutsyuruba (2011)	
	Sindic et al. (2022)	

From Table 1 is possible to see that the most significant part of the studies (n=16) was focused on the formal/informal training category as they studied the IL phenomenon as it occurs among veteran and new teachers within their work contexts. Eight papers focused on IL as a tool and a strategy for teacher education. Two of those papers extended the pre-service teacher education to in-service teacher training. Philip et al. (2022) aimed to study five cases that traverse the professional life course of teachers acting as educational researchers. Kiviniemi et al. (2021) merged in-service and pre-service teachers in peer-mentoring groups. The remaining papers (n=7) were also related to the theme of IL but did not explicitly explore the issue from the teacher education or training perspective.

In a rough connection with such categorization, it was possible to associate the larger context where IL takes place. Obviously, formal and informal teaching training schools are the context. Still, for initial teacher education, the contexts are mainly related to Higher Education Institutions and their environments and partnerships. In this circumstance, the agents of IL are pre-service teachers; Higher Education (HE) teachers, newly professionalized teachers, and veteran or retired teachers, coupled in one case (Pinazo-Hernandis et al., 2016) with other older people. The organization of strategies promoting IL in the initial teacher education context is permanently inscribed in a formal education device and led (and assessed) by HE teachers. Only one of these studies is led by a teacher educator acting as an experienced high school teacher who co-designed a pre-service teacher education course embedded in a high school classroom (Philip et al., 2022). In addition, the initial teacher education papers also explain the devices created and their specificities to demonstrate how such practices could be a way to "extend student experiences in their initial teacher education courses and as an additional strategy to further support pre-service teachers in the quest of becoming a teaching professional" (Pardy & Reimer, 2018, p. 107).

Within the continuous and informal training contexts, the aim of IL is always professional development; the context is always schools and their environments. Different generations of teachers (beginners, experienced, veterans, seniors), educational managers and leaders are the agents of IL events. Papers focusing on such contexts sometimes tell stories concerning IL initiatives. However, the most significant part is simply portraying school agents' perceptions, experiences or practices on the issue. In this set of papers, the aim could be summarised as Brücknerová and Novotný (2017a, p. 397) did when they asked, "What are teachers of different generations learning from one another in schools, and in what ways does this learning take place?". Nevertheless, the diversity of research perspectives and objects emphasises the richness and complexity of the IL concept. Three examples are enough to demonstrate such complexity: Geeraerts, Tynjälä and Heikkinen (2018) examined how and what teachers learn from their older and younger colleagues; Kazak and Polat (2018) explored the relationship among school administrators' instructional leadership behaviours, intergenerational atmosphere, and intergenerational learning in schools; Sindic et al. (2022) sought to investigate preschool teachers' viewpoints regarding essential intergenerational learning factors for their professional development and growth.

Finally, one reviewed paper studied intergenerational learning from other perspectives, focusing on the collegiality dimension that IL promotes (Klein & Shapira-Lishchinsky, 2016). In close relation to this, Çelik and Polat (2022) tried to define correlations among knowledge sharing and intergenerational learning. Some other papers studied IL as a key concept to preserve cultural memory concerning education values and practices and roughly argue the benefits of such preservation to new generations of professionals, both as a key strategy to organize curriculum and didactics thought (Diamond & Bulfin, 2021; Pitfield et al., 2023) or to define strategies for linking successive generations of Black educators (Loder-Jackson, 2012). Another paper studies teachers' age-related stereotypes from a generational perspective (Geeraerts et al., 2021).

Factors that Facilitate the Success of Intergenerational Learning

Among practices that could be directly related to teaching improvement was referred internal training among teachers of different ages that exist in schools (Brücknerová & Novotný, 2017a; Geeraerts, Tynjälä & Heikkinen, 2018), such as classroom visits (Geeraerts et al., 2016), namely those made by retired teachers who make observations and talk with prospective teachers (Pardy & Reimer, 2018; Santoro et al., 2012). Mentoring sessions were primarily linked to the early stages of teachers' training, representing a practice that holds promise in assisting novice educators to cultivate a passion for teaching (Rojas, 2015). Older-generation in-service teachers' (Kiviniemi et al., 2021; Santoro et al., 2012) and mentors from universities performed this mentoring.

Other practices referred in the texts focused on other strategies and aims rather than classroom observation include the development of collaborative activities among colleagues (Geeraerts et al., 2016); research focused on teaching activities (Polat & Kazak, 2015); the development of communities of practice (Rojas, 2015), and meetings of future professors with older people (Pinazo-Hernandis et al., 2016).

Looking for the Factors that facilitate and could explain the success of IL (Table 2), it is possible to identify three sets of factors: the first one came from the richness given by the experience that came with the proximity and relevance of the experiences brought by recent teachers (Brennan & Clarke, 2011) or by the diversity of processes and opportunities that learning with others in the workplace entails, (Brücknerová & Novotný, 2017a; Geeraerts, Tynjälä & Heikkinen, 2018), or by proximity to learning resources (Geeraerts, Tynjälä & Heikkinen, 2018).

Table 2. Factors That Facilitate IL

The IL experience itself	proximity and relevance
	the diversity of processes and opportunities
	proximity to learning resources
The positive atmosphere	friendly and open school climate
	importance of middle-aged cohort as a source of advice in the team
	IL´"inspiration-driven" character
Formal existence and need awareness of Intergenerational training programs	the awareness of school administrations of the existing generational gap
	convergence of initial and continuous training itineraries
	joint reflective work for the development of new pedagogical devices

The second set of factors that facilitate IL is related to the positive atmosphere created: some papers described the importance of a friendly and open school climate that shows that intergenerational learning takes place in both directions (Geeraerts, Tynjälä & Heikkinen., 2018; Kazak & Polat, 2018). In this set, the importance of the middle-aged cohort as a source of advice in the teachers' team (Geeraerts et al., 2017) and as a possible link between the other generations (Rojas, 2015) was also referred. Another issue of this set of factors is the IL's ´"inspiration-driven" character rather than "transformative" or just "exploratory" (Brücknerová & Novotný, 2017a), which seems more agreeable to participants.

The third set of factors is closely related to formal existence and the need for awareness of Intergenerational training programs (Kazak & Polat, 2018; Rojas, 2015; Santoro et al., 2012). Related to such existence, other studies mentioned the awareness of school administrations of the existing generational gap and its characteristics in order to design better ways to promote intergenerational communication (Polat, Çelik & Okçu, 2019); or the convergence of initial and continuous training itineraries and the joint reflective work for the development of new pedagogical devices (Rojas, 2015).

Factors That Constraints Intergenerational Learning

Considering the factors that constraints IL, one may consider these factors within three categories: communicational, statutory, and political.

The lack of communication, referred by Polat and Kazak (2015), is also underlying the conclusions made by other researchers when they notice stereotypes of older people about younger people and vice versa (Geeraerts et al., 2021; Kazak & Polat, 2018), namely about their knowledge and nature (about content, pedagogical, ICT, etc.) (Geeraerts, Vanhoof & Van den Bossche, 2018). Other studies found that proximity in the workplace of new teachers tends to be with

those of their generation (Geeraerts, Tynjälä & Heikkinen, 2018; Kazak & Polat, 2018). However, older teachers tend to approach younger and middle-aged teachers and form more intergenerational ties. (Geeraerts et al., 2017). Even so, the difference in knowledge, attitudes and skills of the three different generations working in schools presses us to consider the communication gap a problem and discuss how to overcome the inherent troubles (Polat, Çelik & Okçu, 2019).

The statutory category is referred to in a specific paper (Brennan & Clarke, 2011) that researched how the inclusion of recent graduates as pre-service instructors facilitates the IL experiences. Without denying the benefits of the in-between status of the recent graduates, their proximity to pre-service teachers also induces the other side of the dilemma - the difficulty of being perceived as a faithful instructor.

From a political perspective, several studies have referred to the need for a political strategy that considers the workspace an opportunity for professional teacher development. Moreover, Brücknerová and Novotný (2017a) discovered that decisions made by the school leadership drove the implementation of IL. The link between IL and institutional development was intricately tied to the actions and decisions of these leaders (Geeraerts, Tynjälä & Heikkinen, 2018).

Discussion

Starting with the conceptualization of generations, this review contributes to a broader understanding of IL concepts, exploring how they have been defined and applied in empirical operationalization. The literature underscores that the conceptualization of generations varies due to factors like chronological boundaries, operationalization, and inclusion of additional dimensions. These disparities underscore the intricacies involved in understanding and studying generational phenomena in diverse contexts, particularly within IL. The studies show that the complexity they face is the most significant challenge, which simultaneously limits and enhances them. They should not be limited by age, they must consider the impact of professional culture and career position, in interdependence with the leadership situation of school directors, with school culture.

While exploring the selected articles, the connection between IL and professional development was clearly understood. This highlight is in line with Geeraerts et al. (2016) ideas when they suggest that the loss of critical organizational knowledge and experience from retiring teachers needs to be addressed, namely through creating a professional learning environment where teachers exchange their experiences and ideas with one another. Creating such environments can preserve the knowledge and insights of retiring teachers, offering valuable opportunities for novice teachers to learn about the profession and teaching in a supportive and friendly context. IL is strengthened in the bonds created through dialogue, where collegial interactions and collaboration generate emotionally inclusive work environments and build meaningful professional development, promoting lifelong learning.

According to Edge (2014, p. 137), "each generational cohort brings collective attributes, attitudes and aspirations to their work and the workplace; and that developing a better understanding of both the individual cohorts and the outcomes of the generational mix will support both individual and organisational efforts to recruit, develop and retain each generation of workers". Furthermore, Geeraerts et al. (2017) indicate that the professional connections among school team members offer chances for intergenerational knowledge exchange. Members of the youngest cohort within these teams tend to engage in relationships within their own generation, while those from the oldest cohort prefer intergenerational connections. Consequently, teachers' generational replacement is a critical challenge that nowadays gets more and more attention from the educational system (Romero-Tena et al., 2020).

Accordingly, related to the growth of the importance of teamwork across various sectors in society and the promotion of intergenerational dialogue, Vangrieken et al. (2015) IL as a means to learn collaboratively and address challenges within the workplace. They also note that older generations bring valuable knowledge, experience and skills while younger generations can offer new ideas and perspectives. Martins et al. (2019) identified an increasing interest in fostering intergenerational connections, particularly evident in organizations such as schools through intergenerational programs. This literature review underscores communication challenges in enhancing intergenerational learning. As highlighted by Polat, Çelik and Okçu (2019), the diverse knowledge, attitudes, and skills among generations in schools highlight a communication gap that necessitates discussion on strategies for overcoming these inherent difficulties. One proposed solution to address this communication gap among different school generations is the placement of recent graduates as facilitators for pre-service teachers.

Most intergenerational programs are seen as tools to exchange resources and learning among older and younger generations for social and individual benefits (Granville, 2002; Vieira & Sousa, 2016). The data in this review highlights the critical importance of formal acknowledgment and awareness regarding the necessity of Intergenerational training programs to foster meaningful dialogue. The essence of this learning aligns with statements made by Santoro et al. (2012) regarding the significance of intergenerational programs "could offer novice teachers an opportunity to develop relationships with a former generation of teachers who can [...] provide living models of the value of teaching as a career and the importance of developing a passion for their work" (p. 593). Thus, the flow of intergenerational knowledge appears to be relevant to IL. This flow of knowledge helps build bridges between generations and provides a holistic view

of cultural, historical and generational perspectives. By exchanging knowledge between generations, the entire teaching community can benefit.

Two consequences arise from the exchange of knowledge among generations. One is related to teachers' professional development. As it was possible to check in the present literature revision, the richness of the process is more extensive if it includes intergenerational connections; this is in line with Geeraerts, Tynjälä and Heikkinen (2018) findings as well as with Ruiz et al. (2021) results concerning intergenerational benefits on the professional development of all teachers. Consequently, and as a second outcome, IL stands out as a relevant process to support developing and updating teachers' skills, deepen their specialized knowledge, encourage collaborative work, and enhance their personal and professional well-being. To facilitate this, it is essential to ensure that teachers have the necessary time and space to engage in IL, supported by the resources required. From a political standpoint, it is paramount to perceive the workspace as an opportunity for teacher professional development, emphasizing the need for informed decision-making by school leadership to enhance IL experiences (Brücknerová & Novotný, 2017a). The intricate link between IL and institutional development hinges on the actions and decisions of these leaders who view IL as an organizational aim (Geeraerts, Tynjälä & Heikkinen, 2018).

Conclusion

Having a broader perspective of IL as a starting point, this review allowed informing challenges and requirements for future IL in teacher education and development.

Firstly, the review showed that besides the increase in the last decades of research in IL within the educational context, an absence of the prospective dimension still prevails. The contexts in which the studies take place showed that the initiatives are from local and intermediary actors in the teachers' education or teachers' training - universities and schools- exposing that there does not seem to be an intergenerational concern in macro policies.

The promotion of IL takes place in very different ways and forms, although reflection on what is different seems to be a dominant trait (although not explicitly stated or studied). This feature shows that intergenerational learning could be an essential tool to shape teacher education differently.

Another remarkable feature of promoting IL is that the contents and pedagogical forms are more present in research, in addition to the historical relativity associated with these choices. The exception is an article focusing on writing and others focusing on generations' attitudes (Rojas, 2015).

Recommendations

It would be interesting to promote studies focused on other subjects, for example, teaching skills, promoting citizenship, but also more metacognitive, both for the oldest and the youngest (for example- how do I learn today?).

Encouraging interactions between teachers of varying generations holds a dual significance. Initially, it diminishes generational stereotypes and gaps; secondly, it fosters the exchange of knowledge and skills, facilitating the empowerment of intergenerational learning within school teams and teacher education. Moreover, creating a bridge between generations in teacher education and continuous professional development, namely through intergenerational dialogues in different spaces (schools and universities), can be a way to improve teacher development. This scenario could be an asset to face the loss of attractiveness of the teaching career.

To ensure the effectiveness of IL, it must be intentional, sought after by the diverse generations involved to enhance awareness, and recognized as a strategic organizational aim.

Finally, it is important to include the IL both as content and as a strategy in initial teachers' education programmes

Authorship Contribution Statement

Batista: Generating ideas and conceptualization, developing the search and writing the introduction, methodology, discussion and conclusion, and final editing. Mouraz: Generating ideas and conceptualization, writing the introduction, results and discussion, and conclusion. Viana: Generating ideas and conceptualization, writing the introduction and results. Graça: Generating ideas and conceptualization, developing the search, writing the introduction and defining and writing the results.

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