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Is There a Skills Gap? Information Literacy and Primary School Teachers' Attitudes Towards Research

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In recent decades, national and international initiatives have encouraged teachers to integrate research evidence into their teaching practice. In order for teachers to implement evidence-informed practices, they must hold positive attitudes towards research. While much of the existing research focuses on higher education and teacher training, relatively little is known about the factors shaping primary school teachers' engagement with research. The present study addresses this gap by examining associations between primary school teachers' attitudes towards research and their individual characteristics and competencies, specifically their age, years of teaching experience, prior education and information literacy skills. Survey data were collected from 120 primary school teachers. Analyses progressed from bivariate correlations and group comparisons to multiple regression modelling. Although bivariate analyses suggested that older and more experienced teachers reported more negative attitudes towards research, these demographic associations were no longer significant once information literacy skills were included in the regression model. Instead, information literacy skills emerged as the only significant predictor of teachers' attitudes towards research, while prior education showed no effect. By identifying information literacy skills as a malleable competency, the study highlights the opportunity for targeted professional development to facilitate the sustainable integration of research evidence into primary education.

Keywords: evidence-informed practice, primary school teachers, attitudes, personal characteristics, information literacy skills

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Ali obstaja vrzel v spretnostih? Informacijska pismenost in stališča osnovnošolskih učiteljev do raziskav

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V zadnjih desetletjih so nacionalne in mednarodne pobude spodbujale učitelje, da naj v svojo pedagoško prakso vključijo raziskovalne dokaze. Da bi učitelji lahko izvajali na dokazih utemeljene dejavnosti, morajo imeti pozitivna stališča do raziskav. Medtem ko se večina obstoječih raziskav osredinja na visokošolsko izobraževanje in usposabljanje učiteljev, je o dejavnikih, ki vplivajo na uporabo raziskav pri osnovnošolskih učiteljih, znanega sorazmerno malo. Ta študija obravnava to vrzel s preučevanjem povezav med stališči osnovnošolskih učiteljev do raziskav ter njihovimi individualnimi lastnostmi in kompetencami, zlasti z njihovo starostjo, delovno dobo, s predhodnim izobraževanjem in z veščinami informacijske pismenosti. Podatki ankete so bili zbrani pri 120 osnovnošolskih učiteljih. Analize so potekale od bivariatnih korelacij in primerjav skupin do modeliranja z večkratno regresijo. Čeprav so bivariatne analize nakazovale, da so starejši in izkušenejši učitelji poročali o bolj negativnih stališčih do raziskav, te demografske povezave niso bile več pomembne, ko so bile v regresijski model vključene veščine informacijske pismenosti. Namesto tega so se veščine informacijske pismenosti izkazale kot edini pomemben napovednik stališč učiteljev do raziskav, medtem ko predhodno izobraževanje ni pokazalo nobenega učinka. S tem, da študija opredeljuje veščine informacijske pismenosti kot prilagodljivo kompetenco, poudarja priložnost za ciljno usmerjeno strokovno izpopolnjevanje, ki bi olajšalo trajnostno vključevanje raziskovalnih dokazov v osnovnošolsko izobraževanje.

Ključne besede: na dokazih utemeljena dejavnost, osnovnošolski učitelji, stališča, osebne lastnosti, veščine informacijske pismenosti

Introduction

European and Spanish policies and laws (European Commission, 2012; LOE, 2006; LOMLOE, 2020) encourage teaching professionals to implement evidence-informed practices, defined as the ability to search for, evaluate and apply research evidence alongside professional expertise. In the present study, we use the term evidence-informed practice (EIP) to emphasise the integration of research evidence with professional judgement and tacit knowledge, distinguishing it from more prescriptive notions of evidence-based teaching. In line with these policy frameworks, Spanish educational laws and initiatives (e.g., Department of Education, 2023) promote EIP as a means to enhance teaching effectiveness, professional development and student outcomes.

Despite these efforts, the implementation of EIP in Spanish primary classrooms remains limited (Ministerio de Educación, 2011). Although teachers generally acknowledge the value of research for informing teaching and learning, many remain hesitant to use research evidence in their daily practice (Cabañero et al., 2020; Gairín & Ion, 2021). This suggests a persistent divide between policy expectations and classroom realities. While international calls for EIP in education continue to grow (OECD, 2022), research on its implementation remains limited, particularly at the primary education level. This gap highlights the need to examine individual factors associated with teachers' engagement with research evidence.

The present study examines how individual factors, including demographic factors (age, years of teaching experience and prior education) and competencies (e.g., information literacy skills), are associated with Spanish primary school teachers' attitudes towards research. Drawing on the Theory of Planned Behaviour (Ajzen, 1991), information literacy skills (ILS) are conceptualised as an internal individual competence contributing to perceived behavioural control, which is associated with attitudes towards research. The study further draws on the Knowledge-to-Action framework (Graham et al., 2006) in order to situate ILS within teachers' individual readiness for research use, while acknowledging that broader contextual determinants of implementation lie beyond the scope of the present analysis. By focusing on an underresearched teacher group, we provide new insights into factors associated with attitudes towards research. The findings can inform more targeted professional development efforts and support sustainable strategies for the implementation of EIP, both in Spain and across European education systems.

EIP in Primary Education

EIP positions teachers as discerning professionals who thoughtfully integrate research evidence with their rich experiential knowledge in order to guide instructional decisions (Dalheim et al., 2012; Davies, 1999). This approach is particularly crucial in primary education, as these educators lay the foundational building blocks for future learning and shape young citizens' capacity to navigate an increasingly complex world. By embracing EIP, primary school teachers can make informed decisions about teaching interventions with established empirical support, such as interpreting evidence on the effectiveness of school-based anti-bullying initiatives (e.g., Gaffney et al., 2019), opting for effective interventions for learners with dyslexia (e.g., Galuschka et al., 2020) or enhancing classroom well-being (White & McCallum, 2020).

Consequently, international standards (European Commission, 2012), national laws (e.g., LOMLOE, 2020) and regional policies (e.g., Department of Education, 2023) increasingly emphasise the need for primary teachers to be competent in implementing EIP. Despite these expectations, EIP has not been widely adopted in Spanish classrooms (Ministerio de Educación, 2011). This aligns with findings from Catalonia, a region in Spain where EIP implementation across schools remains inconsistent (Ion et al., 2021).

Primary school teachers in Spain teach children aged 6 to 12 and are required to complete a four-year bachelor's degree in Primary Education. The establishment of this degree structure in 2010, driven by the Bologna Process, partly aimed to develop pre-service teachers' research competencies, an area often overlooked in previous training programmes. While research suggests that teachers generally acknowledge the potential benefits of EIP, many remain resistant to incorporating it into their practice (Cabañero et al., 2020; Gairín & Ion, 2021). This is primarily due to several limitations that teachers encounter, such as lack of time, limited resources, insufficient research skills and lack of institutional support (Díaz Costa, 2010; Perinés, 2018; Raiker, 2020). These limitations reveal the complex relationship between policy requirements, teachers' training and classroom reality.

Teachers' Research Attitudes Towards EIP

Attitudes are commonly defined as predispositions to respond in a favourable or unfavourable manner towards specific behaviours (Aarons, 2004; Diery et al., 2021; Wyer & Albarracín, 2005). The present study measures attitudes towards research, since positive attitudes towards research are viewed as

a psychological prerequisite for the successful implementation of EIP (Diery et al., 2021; Georgiou et al., 2023; Tack & Vanderlinde, 2016). In order to explore how these attitudes are formed and sustained, a dual-lens approach is adopted, integrating the Theory of Planned Behaviour and the Knowledge-to-Action framework. The Theory of Planned Behaviour (Ajzen, 1991) serves as the internal lens, modelling the psychological processes of the individual teacher. This theory identifies perceived behavioural control as a central driver of intention and then behaviour. In the context of this study, ILS are conceptualised as a key component of perceived behavioural control, such that teachers' perceived mastery in finding and evaluating research is expected to be associated with more positive attitudes towards research.

While the Theory of Planned Behaviour explains these internal psychological mechanisms, the Knowledge-to-Action framework (Graham et al., 2006) provides a complementary perspective by situating attitudes towards research within a broader process of research use. The framework distinguishes between individual readiness for research use and contextual determinants operating at the school or system level. The present study focuses exclusively on individual-level factors of readiness, while broader contextual determinants are not explored empirically. Within this focus, teachers' attitudes towards research and their ILS constitute individual readiness for research use, while teachers' age, years of teaching experience and prior education are conceptualised as background characteristics that may be indirectly related to readiness.

This framing allows us to explore whether associations between demographic characteristics and attitudes towards research reflect their shared variance with ILS, while understanding how attitudes function both as psychological drivers and as a foundational component of readiness for research use. Without sufficient individual readiness, engagement with evidence may be limited even before broader implementation processes are considered. Before encountering such challenges, teachers may demonstrate scepticism about the relevance of academic research to real classroom contexts or may exhibit resistance to changing established routines (Monereo, 2010). These attitudes can weaken teachers' readiness to engage with EIP (Ajzen, 1991; Graham et al., 2006). Therefore, fostering positive attitudes towards research is not only a theoretical necessity but also a practical one. Supporting positive attitudes towards research may strengthen teachers' engagement with EIP and, ultimately, instructional decision-making.

Factors Associated With Teachers' Research Attitudes

In order to better understand teachers' engagement with research, the present study focuses on individual factors associated with research attitudes, distinguishing between relatively stable background characteristics and competencies that can be developed over time (Blömeke et al., 2015; Kwakman, 2003). Specifically, we explore teachers' demographic characteristics and ILS.

Individual Demographic Factors: Age, Experience and Prior Education

Changes in Spanish teacher education following the Bologna Process (1999) offer an important historical and policy context for interpreting generational differences among teachers. These reforms extended primary teacher education to a four-year degree and introduced formal research components, including a mandatory bachelor's thesis (BOE, 2007). Research suggests that completing a bachelor's thesis is associated with higher research self-efficacy among pre-service teachers (Palou Julian et al., 2022), which has been linked to more positive research attitudes (Williams & Coles, 2007). This raises the expectation that younger, less experienced teachers may hold more positive attitudes than their colleagues educated before these reforms, although empirical evidence among primary teachers remains scarce. Similarly, teachers with postgraduate qualifications often report stronger research engagement (Kakupa, 2019; Raiker, 2020), yet evidence remains limited.

Individual Competency: ILS

ILS refer to the ability to find, critically evaluate and use information effectively (American Library Association, 2000), and are fundamental to engaging with research evidence (Williams & Coles, 2007). We conceptualise ILS as a practice-oriented competence that supports informed professional judgment, rather than full methodological expertise required to independently evaluate complex intervention studies. Primary teachers require sufficient ILS to identify relevant research, critically appraise its credibility and consider its implications for their classroom context (Davis, 1999; Groß Ophoff et al., 2017; Thomm et al., 2021). However, lack of time, limited access to scientific sources and historically limited attention devoted to research methods in teacher education may hinder the development of these skills (Ratcliffe et al., 2005; van Schaik et al., 2018). This lack of opportunity to engage with research may be associated with less positive attitudes towards research (e.g., Thomm et al., 2021).

Evidence from healthcare demonstrates a positive association between stronger ILS and positive attitudes towards research, often enhanced through

targeted professional development efforts (Brown et al., 2010; Labrague et al., 2019; Lim et al., 2012). It is reasonable to assume a similar relationship between ILS and attitudes towards research in education. However, disciplinary differences between healthcare and education should be acknowledged when drawing such parallels, highlighting the need for further examination of this relationship in educational contexts.

The Present Study

This study aims to explore the factors associated with Spanish primary school teachers' attitudes towards research. By examining teachers' individual factors, the study seeks to clarify associations between individual characteristics and research attitudes among in-service primary school teachers. Given the limited adoption of EIP in Spain and the broader European agenda promoting it, these insights can inform professional development strategies designed to bridge the research-practice gap. Aligned with the Knowledge-to-Action framework, such strategies can help further support an enabling environment where individual teacher readiness is reinforced by institutional and systemic support. Strengthening the integration of research into teaching practice may also contribute to improved instructional quality and better student outcomes across European educational contexts. The following research questions guided the present study:

1. To what extent do primary school teachers' individual demographic factors (age, years of teaching experience, prior education) relate to their attitudes towards research?
2. To what extent do primary school teachers' individual competencies (ILS) relate to their attitudes towards research?

Method

Participants

The participants were $N = 120$ primary school teachers working in Spanish primary schools, mainly women (91%) aged between 18 and 30 years (61%). Most of the participants held a bachelor's degree (60%), followed by a master's degree (28%), and had 1–5 years of teaching experience (63%). Table 1 presents a detailed summary of the participants' sociodemographic characteristics. For participant recruitment, two non-probability sampling methods were used: (a) convenience sampling was applied to select full-time and part-time working primary school teachers who were accessible, and (b) snowball sampling was

employed by asking the initial respondents to distribute the study information to their colleagues (Etikan & Babat, 2017). Informed consent was obtained electronically prior to participation in the study.

Table 1

Participants' Sociodemographic Characteristics

Variable	*n*	%
Gender		
Female	109	91
Male	10	8
Other	1	1
Age		
18–25	39	33
26–30	34	28
31–40	18	15
41–50	10	8
50–60	19	16
Educational background		
Bachelor's degree	72	60
Post-bachelor's degree	13	11
Master's degree	34	28
PhD	1	1
Years of teaching experience		
1–5	75	63
6–10	9	8
11–15	10	8
16–20	11	9
> 20	15	13

Instruments

Data collection was undertaken using a three-part online survey. The first part included sociodemographic questions about gender, age, education, current job and years of teaching experience (6 items). In the second part, two validated instruments were administered: the Information Literacy Test (Leichner et al., 2013) and the Attitudes Towards Research subscale (Georgiou, 2020).

Information Literacy Test

The Information Literacy Test consisted of 22 items designed to assess the participants' ILS (Leichner et al., 2013). The test was divided into two sections: the first section measured the ability to search for information (14 items), and the second section assessed the ability to evaluate the quality of information (8 items). Most of the items were multiple-choice, except for one open-ended item that required the participants to respond using keywords (item 15: Which criteria can be used to judge the quality of a book or a journal article?). The multiple-choice questions typically offered three possible answers, although item 19 provided two options. An example of an item with three possible answers was "Which are the features of a scientific internet forum?" and the answer options were: *The forum is provided by a reputable organisation; Entries are archived, so that the discussion can be retraced; Authors publish using their real names instead of pseudonyms*. Some items allowed for more than one correct answer; for these, each correct choice was awarded 0.33 points, resulting in a maximum possible score of 22. In the original validation study, the test demonstrated good reliability (α = 0.82) (Leichner et al., 2013). In the present study, Cronbach's alpha was calculated to assess internal consistency, resulting in marginal internal consistency (α = .66), which is considered acceptable for exploratory research.

Attitudes Towards Research Subscale

The Attitudes Towards Research subscale, included in the Evidence-Based Teaching scale (Georgiou, 2020), is a six-point Likert scale ranging from 1 ('*strongly disagree*') to 6 ('*strongly agree*'). The subscale consisted of 10 items where teachers indicated their level of agreement with the use of evidence in their teaching practices. All of the items in the attitudes subscale were phrased negatively (e.g., Teaching based on current research evidence is a waste of time), such that higher scores reflected more negative attitudes towards research (items were not reverse-coded for the present analyses). Additional items reflect tensions between research use and professional judgement or autonomy (e.g., Previous teaching experience is more important than the use of current research evidence), indicating that the scale reflects not only scepticism towards research but also concerns about professional autonomy and classroom realities. In order to assess the scale's reliability, Cronbach's alpha was calculated, revealing an acceptable internal consistency for the scale (α = .79) (Gliem & Gliem, 2003).

Both instruments, originally written in English, were translated into Spanish using a back-and-forth translation method (Body et al., 2021), following

a four-step approach. First, the first author, a native Spanish speaker, completed an initial (forward) translation. Second, two fellow bilingual researchers back translated the instruments from Spanish to English. Third, the translations were compared and discussed to ensure linguistic equivalence. Fourth, a pilot test with four Spanish primary school teachers was conducted to assess clarity, comprehension and completion time, resulting in minor revisions and adaptation of domain-specific language to the educational context.

Research Design

The study used a cross-sectional, quantitative correlational design to examine associations between teachers' individual characteristics, ILS and attitudes towards research. The data for the study were analysed using IBM SPSS Statistics (version 28). First, Cronbach's alpha coefficients were calculated to assess the internal consistency of the instruments measuring ILS and attitudes towards research. Before the main analyses, the data were checked to ensure that the assumptions for multivariate analysis were met; specifically, independence of observations, linearity and normality were checked, as well as the absence of multicollinearity, homoscedasticity and outliers. No major violations were found. Descriptive statistics were also calculated. In order to answer the research questions, three types of statistical analyses were performed. First, a Spearman rank order correlation analysis was conducted to examine the relationships between the independent variables (age, years of teaching experience and ILS) and the dependent variable (attitudes towards research). Since the number of participants with advanced academic qualifications was relatively small, a correlation analysis was not suitable for the variable of prior education. Instead, a Mann-Whitney U analysis was conducted to compare the attitudes towards research between two groups: teachers with only a bachelor's degree and those with additional academic qualifications (post-bachelor's diplomas, master's degrees or PhDs). A multiple linear regression analysis was conducted to examine the extent to which individual demographic characteristics (age, years of experience and prior education) and ILS predicted teachers' attitudes towards research. Categorical variables, such as prior education for the regression analysis, were dummy-coded.

Results

Preliminary analyses were conducted to assess whether the assumptions of normality, linearity, homoscedasticity, independence, absence of outliers and multicollinearity were met. Only the assumption of normality was violated for the research attitudes variable, as the histogram and normal probability plot indicated positive skew. Therefore, non-parametric tests were used for bivariate analyses. Multiple regression analysis was conducted to examine multivariate associations, and assumption checks indicated no major violations of linearity, homoscedasticity or multicollinearity. Given the robustness of linear regression to moderate deviations from normality, the analysis was retained. The participants demonstrated moderately positive attitudes towards research, with a mean score of $M = 2.50$ ($SD = 0.85$) on a six-point Likert scale, and achieved an average score of 57.4% ($M = 12.62$; $SD = 2.02$) on the information literacy test. The median age category of the participants was 26–30 years, and the median years of teaching experience was from 1 to 5 years.

The Relationship Between Age, Years of Teaching Experience, ILS and Attitudes Towards Research

Spearman rank-order correlation analyses were conducted to examine the relationships between age, years of teaching experience, ILS and attitudes towards research. A significant positive correlation was found between age and attitudes towards research, $r\,(118) = .25$, $p = .006$, and between years of teaching experience and attitudes, $r\,(118) = .25$, $p = .007$, indicating higher scores on the attitude scale, which reflect more negative attitudes. Conversely, a significant negative correlation was found between ILS and attitudes towards research, $r\,(118) = -.25$, $p = .007$, suggesting that teachers with higher ILS scores tended to report more positive attitudes towards the use of research evidence. Prior education was not included in the correlation analysis due to small group sizes; no significant association was found between prior education and attitudes towards research (see Mann–Whitney U results below). Given that the attitude items were negatively phrased, these results indicate that older and more experienced teachers reported more negative attitudes towards research, whereas teachers with higher ILS scores reported more positive attitudes. Table 2 presents the correlation coefficients.

Table 2

Spearman's Correlation Between the Variables

Variables	1	2	3	4
Attitudes towards research	-			
Age	.25**	-		
Years of teaching experience	.25**	.72**	-	
Information Literacy Skills	-.25**	-.10	-.12	-

Note. **Correlation is significant at the 0.01 level (2-tailed).

Comparison Between Teachers' Attitudes Based on Their Educational Background

In order to compare teachers' attitudes based on educational background, a Mann-Whitney U test was run between teachers with only a bachelor's degree and those with further academic education (post-bachelor's diploma, master's or PhD). The test revealed no significant difference between the two groups, U = 1651.5, z = -.411, p = .681, suggesting that educational attainment beyond a bachelor's degree is not significantly associated with teachers' attitudes towards research.

The Effects of Personal Characteristics and ILS on Attitudes Towards Research

A multiple linear regression was run to determine whether age, years of teaching experience, prior education and ILS were associated with attitudes towards research. The overall model was statistically significant, F (4, 115) = 3.36, p = .012, with an R^2 of .105, indicating that approximately 10.5% of the variance in attitudes towards research was accounted for by the set of predictors. Among the predictors, only ILS was significantly associated with attitudes towards research ($B = -.080$, $\beta = -.191$, $t = -2.091$, p = .039), indicating that higher ILS scores were associated with more positive attitudes. The remaining variables were not significant predictors. Age, years of teaching experience and prior education were not significantly associated with attitudes towards research in the multivariate model. Table 3 presents the regression coefficients.

In summary, while age and years of teaching experience were associated with more negative attitudes towards research in bivariate analyses, only ILS were significantly associated with attitudes towards research in the multivariate

model, with higher ILS scores associated with more positive attitudes. Educational level was not significantly associated with attitudes.

Table 3

Regression Analysis: Primary School Teachers' Research Attitudes

Variables	*B*	*SE B*	*β*	*t*	*p*
Age	.052	.074	.137	.707	.481
Prior Education	-.021	.083	-.023	-.253	.801
Years of Teaching Experience	.020	.048	.084	.427	.670
Information Literacy Skills	-.080	.038	-.191	-2.091	.039

Note. R^2 = .105 (N = 120, p = 0.012).

Discussion

The present study explored how individual demographic characteristics (age, years of teaching experience and prior education) and ILS are associated with primary school teachers' attitudes towards research. The findings indicate that although age and teaching experience were associated with attitudes, only ILS remained significantly associated with attitudes once all of the variables were considered simultaneously. This pattern suggests that differences in attitudes across career stages may be better understood in terms of underlying differences in ILS rather than age or experience per se. These findings have important implications for how teacher professional development is conceptualised and organised.

The first research question examined whether primary school teachers' individual demographic characteristics are associated with their research attitudes. The results showed that age and teaching experience were highly correlated (r = .72), suggesting that these variables largely reflect the same underlying career stage within this sample. Although significant positive associations were found between age, teaching experience and attitudes towards research at the bivariate level, neither variable remained significant once ILS was included in the regression model. This indicates that age and experience are not independently associated with attitudes, and that their bivariate relationships likely reflect shared variance with ILS. In line with previous research, recent educational reforms, such as the inclusion of bachelor's theses, may better prepare pre-service teachers to engage with research (Palou Julian et al., 2022; Williams & Coles, 2007). In contrast, teachers educated before these reforms may have

had fewer opportunities to develop formal research competencies, which may shape their perceived readiness to engage with research and their attitudes towards its use (e.g., Monereo, 2010).

Conversely, no significant differences were found between teachers with a bachelor's degree and those with further academic qualifications. This result contrasts with psychology literature (Leichner et al., 2013) and teacher education literature (Impedovo & Malik, 2016), which suggest that professionals become more information literate as their education advances. In the present sample, however, the median ILS scores for teachers with a bachelor's degree (Mdn = 12.9, IQR = 3.0) and those with further education (Mdn = 12.4, IQR = 2.9) were highly comparable. This small difference suggests that within this cohort, additional formal qualifications did not correspond to higher ILS, which may help explain the absence of significant differences in research attitudes between the two groups.

Another possible explanation relates to teachers' prior research experience. Research engagement can positively shape teachers' research attitudes. For example, doctoral candidates often exhibit stronger research attitudes partly due to their preparation for academic careers (Kakupa, 2019; Raiker, 2020). In the present sample, however, only one participant held a PhD, suggesting limited variation in formal research experience across educational levels. Furthermore, the diversity of postgraduate programmes in education, ranging from research-oriented to more practice-focused degrees, may further explain the similarity in attitudes between the two groups.

Regarding the second research question, a negative correlation between ILS and research attitudes was found, suggesting that teachers with a higher level of ILS tended to report more positive attitudes towards research. This pattern has also been observed in healthcare education (Melnyk et al., 2004; Ruzafa-Martínez et al., 2016) and may similarly apply in the teaching profession.

The most interesting finding emerges from the multivariate regression model. Once ILS was included, the associations of age and teaching experience with attitudes were no longer statistically significant, revealing ILS as the primary unique factor associated with research attitudes. This suggests that less positive attitudes observed among more experienced teachers are not necessarily due to age or experience, but may instead reflect differences in ILS. Importantly, less favourable responses on the attitudes scale should not be interpreted as simple resistance to research. Even among teachers with lower ILS, such responses may also reflect more critical standards for what is considered useful or appropriate research use, including concerns about rigid programmes and whether research fits specific classroom contexts. This scepticism may,

for example, partly reflect professional judgement rather than a rejection of research itself, given that teachers must integrate research evidence with contextual knowledge, experience and sometimes competing educational goals (Renkl, 2022).

From a Knowledge-to-Action perspective, these findings highlight the central role of ILS as a factor of individual readiness for research use (Graham et al., 2006). This is consistent with previous studies showing that stronger self-perceived research abilities are associated with more positive research attitudes (Palou Julian et al., 2022; van der Linden et al., 2015; Williams & Coles, 2007). The present study extends this work by showing that not only self-perceptions but also objectively assessed ILS are associated with research attitudes.

From both a Knowledge-to-Action and a Theory of Planned Behaviour perspective, these findings further suggest that ILS may function as a concrete source of perceived behavioural control (Ajzen, 1991). Teachers who possess stronger skills for finding and evaluating research evidence may feel more capable of engaging with research, which in turn is associated with more positive attitudes. In the Spanish context, where many in-service teachers were trained before the Bologna reforms and received limited formal research training, these findings suggest that structural differences in teacher education may be reflected in differences in perceived ability and readiness to engage with research.

In a nutshell, the findings of the study help us reinterpret the observed age and experience effects. What may appear as a generational gap in research attitudes may be better explained as a skills gap. Differences in attitudes across age and experience groups are therefore more likely to reflect differential access to research training and opportunities to develop information literacy, rather than age-related resistance to evidence use per se.

Limitations and Future Research

The study reveals some limitations that offer new directions for future research. Firstly, the validity of ILS for Spanish primary school teachers should be further examined to confirm their psychometric properties. Although the instrument has been validated in prior research, it has not been formally standardised for Spanish primary school teachers. Therefore, absolute ILS scores should be interpreted with caution, and future research could employ item-level analyses (e.g., IRT) to examine measurement invariance and confirm its consistent functioning across teaching contexts. Secondly, the attitude scale, based on self-reported data, is susceptible to social desirability bias, potentially skewing results. Despite anonymity measures, the positive skew suggests this

bias may exist. Future research should integrate qualitative interviews (e.g., Georgiou et al., 2023) or observational data (Fryer & Dinsmore, 2020) to gain a more comprehensive understanding of teachers' engagement with EIP.

Finally, the sample's demographic composition limits generalisability. Most of the participants were young (under 30), unlike the average Spanish teacher (40–50) (Ministerio de Educación, 2020), and there was only one teacher with a PhD in the sample. These discrepancies mean that the sample may not be fully representative of all Spanish primary school teachers. Future studies should aim for more demographically diverse samples, including a wider range of ages, experience levels and educational backgrounds, in order to enhance external validity and to more accurately assess the influence of personal characteristics on attitudes towards research.

Practical Implications

Given that ILS emerged as the only uniquely associated factor in the multivariate model, professional development efforts may be most effective when they prioritise the systematic development of teachers' ILS across career stages. While age and experience are fixed demographic factors, ILS are a malleable competency that can be intentionally developed. This highlights a clear opportunity for professional development: strengthening teachers' ILS may enhance their engagement with EIP and foster a more research-positive culture across schools.

Professional development efforts should focus on improving teachers' ILS by providing structured access to relevant research summaries, scheduled collaborative planning time to discuss implementation and regular peer observation cycles with feedback (Czerniawski et al., 2016). Such initiatives may be valuable not only for in-service teachers but also for pre-service teachers, as an opportunity to embed EIP within teacher training programmes (Štemberger, 2020). Ongoing mentoring and leadership support could further reinforce the value of EIP in daily instructional decisions (Darling-Hammond et al., 2017; Ion et al., 2021).

Schools should implement continuing-education initiatives and targeted professional learning networks, which can bridge generational gaps, enabling novice and experienced teachers to collaborate on interpreting research and developing evidence-informed strategies (Brown & Zhang, 2017). However, the effectiveness of professional learning networks usually depends on organisational commitment; specifically, the provision of dedicated time and academic resources, and the presence of expert facilitation to guide evidence

interpretation (Prenger et al., 2019). This approach may help narrow the research-practice gap and support more sustainable integration of EIP.

Conclusion

The present study explored the relationship between primary school teachers' individual characteristics and ILS and their attitudes towards research. While age and years of teaching experience were associated with attitudes at the bivariate level, only ILS remained significantly associated with attitudes in the multivariate model. This suggests that apparent differences in attitudes across career stages may primarily reflect underlying differences in information literacy rather than age or experience. Our findings emphasise the central role of ILS in shaping teachers' attitudes towards research and highlight the potential value of targeted professional development initiatives aimed at strengthening ILS across the teaching profession. Strengthening teachers' ability to engage with research evidence may represent a key leverage point for fostering more positive attitudes towards evidence use and supporting the sustainable implementation of EIP in primary education.

Ethical Statement

This research study was approved by the Ethics Review Board of the Faculty of Social & Behavioural Sciences (FERB) at Utrecht University.

Disclosure Statement

The authors have no conflict of interest to declare.

During the preparation of this manuscript, the authors used ChatGPT on 20 June 2025, with the following prompt: "Please check this text for grammatical inaccuracies and suggest potential edits. Direct revisions to the text are not permitted," for the purposes of editing text. The authors have reviewed and edited the output and take full responsibility for the content of this publication.

Data Availability Statement

Due to ethical and privacy considerations, the datasets generated during this study are not publicly available but may be obtained from the corresponding author upon reasonable request.

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References

Aarons, G. A. (2004). Mental health provider attitudes towards adoption of evidence-based practice: The evidence-based practice attitude scale (EBPAS). *Mental Health Services Research*, *6*(2), 61–74. https://doi.org/10.1023/B:MHSR.0000024351.12294.65

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

American Library Association (2000). ACRL standards: Information literacy competency standards for higher education. *College & Research Libraries News, 61*(3), 207–215. https://doi.org/10.5860/crln.61.3.207

Blömeke, S., Gustafsson, J.-E., & Shavelson, R. J. (2015). Beyond dichotomies: Competence viewed as a continuum. *Zeitschrift für Psychologie*, *223*(1), 3–13. https://doi.org/10.1027/2151-2604/a000194

Body, T., Tao, X., Li, Y., Li, L., & Zhong, N. (2021). Using back-and-forth translation to create artificial augmented textual data for sentiment analysis models. *Expert Systems with Applications*, 178, Article 115033. https://doi.org/10.1016/j.eswa.2021.115033

Boletín Oficial del Estado (BOE). (2007). *ORDEN ECI/3857/2007, de 27 de diciembre, por la que se establecen los requisitos para la verificación de los títulos universitarios oficiales que habiliten para el ejercicio de la profesión de Maestro en Educación Primaria* [Order ECI/3857/2007, of 27 December, establishing the requirements for the verification of official university degrees qualifying for the practice of the profession of primary education teacher]. Ministry of Science, Innovation and Universities of Spain.

Brown, C., & Zhang, D. (2017). How can school leaders establish evidence-informed schools: An analysis of the effectiveness of potential school policy levers. *Educational Management Administration and Leadership*, *45*(3), 382–401. https://doi.org/10.1177/1741143215617946

Brown, C. E., Kim, S. C., Stichler, J. F., & Fields, W. (2010). Predictors of knowledge, attitudes, use and future use of evidence-based practice among baccalaureate nursing students at two universities. *Nurse Education Today*, *30*(6), 521–527. https://doi.org/10.1016/j.nedt.2009.10.021

Cabañero, J., Díaz-Vicario, A., Ion, G., Olmos-Rueda, P., Pulido-Mantas, L., & Suárez, C. I. (2020). *Guía para impulsar prácticas educativas basadas en evidencias en los centros educativos de educación infantil y primaria [Guide for promoting evidence-based educational practices in early childhood and primary schools]*. Universitat Autònoma de Barcelona. https://ddd.uab.cat/pub/llibres/2020/240025/guiaimppraedu_a2020p4.pdf

Czerniawski, G., Guberman, A., & MacPhail, A. (2016). The professional developmental needs of higher education-based teacher educators: An international comparative needs analysis. *European Journal of Teacher Education*, *40*(1), 127–140. https://doi.org/10.1080/02619768.2016.1246528

Dalheim, A., Harthug, S., Nilsen, R. M., & Nortvedt, M. W. (2012). Factors influencing the development of evidence-based practice among nurses: A self-report survey. *BMC Health Services Research*, *12*(1), Article 367. https://doi.org/10.1186/1472-6963-12-367

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute. https://bibliotecadigital.mineduc.cl/bitstream/handle/20.500.12365/17357/46%20Effective_Teacher_Professional_Development_REPORT.pdf?sequence=1

Davies, P. (1999). What is evidence-based education? *Journal of Educational Studies, 47*(2). https://doi.org/10.1111/1467-8527.00106

Department of Education. (2023). *Marc de les competències professionals docents [Professional teaching competencies framework]*. Generalitat de Catalunya. https://projectes.xtec.cat/residencia-docent/wp-content/uploads/usu2294/2023/01/MCPDXXIgener23CAT.pdf

Díaz Costa, E. A. (2010). *Impacto de la investigación educativa en la práctica docente [The impact of educational research on teaching practice]* [Doctoral dissertation, University of Granada]. https://digibug.ugr.es/handle/10481/4873

Diery, A., Knogler, M., & Seidel, T. (2021). Supporting evidence-based practice through teacher education: A profile analysis of teacher educators' perceived challenges and possible solutions. *International Journal of Educational Research Open*, *2*, Article 100056. https://doi.org/10.1016/j.ijedro.2021.100056

Etikan, I., & Babat, O. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal*, *5*(6). https://doi.org/10.15406/bbij.2017.05.00149

European Commission. (2012). *Supporting the teaching profession for better learning outcomes*. European Commission. https://school-education.ec.europa.eu/system/files/2024-04/Supporting-Teacher-Educators-for-better-learning-outcomes.pdf

Fryer, L. K., & Dinsmore, D. L. (2020). The promise and pitfalls of self-report. *Frontline Learning Research, 8*(3), 1–9. https://doi.org/10.14786/FLR.V8I3.623

Gairín, J., & Ion, G. (2021). Prácticas educativas basadas en evidencias. Reflexiones, estrategias y buenas practicas [Evidence-based educational practices: Reflections, strategies and best practices]. *Aula*, *28*, 388–390. https://revistas.usal.es/tres/index.php/0214-3402/article/view/29493

Gaffney, H., Farrington, D. P., & Ttofi, M. M. (2019). Examining the effectiveness of school-bullying intervention programs globally: A meta-analysis. *International Journal of Bullying Prevention, 1*(1), 14–31. https://doi.org/10.1007/s42380-019-0007-4

Galuschka, K., Görgen, R., Kalmar, J., Haberstroh, S., Schmalz, X., & Schulte-Körne, G. (2020). Effectiveness of spelling interventions for learners with dyslexia: A meta-analysis and systematic

review. *Educational Psychologist, 55*(1), 1–20. https://doi.org/10.1080/00461520.2019.1659794

Georgiou, D. (2020). *The research-practice gap in teacher education: Beliefs, evidence and practice of university-based teacher educators* [Doctoral dissertation, Ludwig-Maximilians-Universität München]. https://edoc.ub.uni-muenchen.de/25716/1/Georgiou_Despoina.pdf

Georgiou, D., Diery, A., Mok, S. Y., Fischer, F., & Seidel, T. (2023). Turning research evidence into teaching action: Teacher educators' attitudes towards evidence-based teaching. *International Journal of Educational Research Open*, *4*. https://doi.org/10.1016/j.ijedro.2023.100240

Georgiou, D., Mok, S. Y., Fischer, F., Vermunt, J. D., & Seidel, T. (2020). Evidence-based practice in teacher education: The mediating role of self-efficacy beliefs and practical knowledge. *Frontiers in Education*, *5*. https://doi.org/10.3389/feduc.2020.559192

Gliem, J. A., & Gliem, R. R. (2003, October 8–10). *Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales* [Paper presentation]. Midwest Research to Practice Conference in Adult, Continuing, and Community Education, Columbus, OH, United States.

Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *The Journal of Continuing Education in the Health Professions, 26*(1), 13–24. https://doi.org/10.1002/chp.47

Groß Ophoff, J., Wolf, R., Schladitz, S., & Wirtz, M. (2017). Assessment of educational research literacy in higher education: Construct validation of the factorial structure of an assessment instrument comparing different treatments of omitted responses. *Journal for educational research online*, *9*(2), 37–68. https://doi.org/10.25656/01:14896

Impedovo, M. A., & Malik, S. K. (2016). Becoming a reflective in-service teacher: Role of research attitude. *Australian Journal of Teacher Education* (Online), *41*(1), 100–112. https://search.informit.org/doi/10.3316/informit.793470578009259

Ion, G., Suárez, C. I., & Díaz-Vicario, A. (2021). Evidence-informed educational practice in Catalan education: From public agenda to teachers' practice. *Center for Educational Policy Studies Journal, 11*(2), 37–57. https://doi.org/10.26529/cepsj.1062

Kakupa, P. (2019). Students' attitudes towards research: A study of graduate education students at a Chinese normal university. *Educational Process: International Journal*, *8*(2), 97–110. http://doi.org/10.22521/edupij.2019.82.1

Kwakman, K. (2003). Factors affecting teachers' participation in professional learning activities. *Teaching and Teacher Education*, *19*(2), 149–170. https://doi.org/10.1016/S0742-051X(02)00101-4

Labrague, L. J., McEnroe-Pettite, D., Tsaras, K., D'Souza, M. S., Fronda, D. C., Mirafuentes, E. C., Yahyei, A. al, & Graham, M. M. B. (2019). Predictors of evidence-based practice knowledge, skills, and attitudes among nursing students. *Nursing Forum*, *54*(2), 238–245. https://doi.org/10.1111/NUF.12323

Leichner, N., Peter, J., Mayer, A. K., & Krampen, G. (2013). Assessing information literacy among German psychology students. *Reference Services Review*, *41*(4), 660–674. https://doi.org/10.1108/RSR-11-2012-0076

Ley Orgánica 3/2020, de 29 de diciembre, por la que se modifica la Ley Orgánica 2/2006, de 3 de

mayo, de Educación (LOMLOE) [Organic Law 3/2020, of 29 December, amending Organic Law 2/2006, of 3 May, on Education (LOMLOE)]. (30 December 2020). *Boletín Oficial del Estado*, *340*, 122295–122428.

Lim, A., Nakamura, B. J., Higa-McMillan, C. K., Shimabukuro, S., & Slavin, L. (2012). Effects of workshop trainings on evidence-based practice knowledge and attitudes among youth community mental health providers. *Behaviour research and therapy*, *50*(6), 397–406. https://doi.org/10.1016/j.brat.2012.03.008

Melnyk, B. M., Fineout-Overholt, E., Fischbeck Feinstein, N., Li, H., Small, L., Wilcox, L., & Kraus, R. (2004). Nurses' perceived knowledge, beliefs, skills, and needs regarding evidence-based practice: Implications for accelerating the paradigm shift. *Worldviews on Evidence-Based Nursing*, *1*(3), 185–193. https://doi.org/10.1111/J.1524-475X.2004.04024.X

Ministerio de Educación. (2011). *Estudio sobre la innovación educativa en España [Study on educational innovation in Spain]*. Secretaría General Técnica. https://www.libreria.educacion.gob.es/libro/estudio-sobre-la-innovacion-educativa-en-espana_183373/

Ministerio de Educación. (2020). *Sistema estatal de indicadores de la educación 2020 [State system of education indicators 2020]*. https://www.educacionfpydeportes.gob.es/inee/indicadores/sistema-estatal/ultima-edicion.html

Monereo, C. (2010). ¡Saquen el libro de texto!: resistencia, obstáculos y alternativas en la formación de los docentes para el cambio educativo ["Get out your textbooks!": Resistance, obstacles and alternatives in teacher education for educational change]. *Revista de Educación, 352*, 583–597. https://redined.educacion.gob.es/xmlui/handle/11162/79393

Organisation for Economic Co-operation and Development. (2022). *Who cares about using education research in policy and practice? Strengthening research engagement, educational research and innovation*. OECD Publishing. https://doi.org/10.1787/d7ff793d-en

Palou-Julián, B., Gros-Salvat, B., & Mercader-Tresserras, J. (2022). El Trabajo de Fin de Grado y el desarrollo de la competencia investigadora de los futuros maestros de Educación Infantil y Primaria [The bachelor's thesis and the development of research competence in future early childhood and primary education teachers]. *REIRE Revista d'Innovació i Recerca en Educació*, *15*(2), 1–15. https://doi.org/10.1344/reire.37520

Perinés, H. (2018). ¿Por qué la investigación educativa no impacta en la práctica docente? [Why does educational research not impact teaching practice?]. *Estudios Sobre Educación, 34*, 9–27. https://doi.org/10.15581/004.34.9-27

Prenger, R., Poortman, C. L., & Handelzalts, A. (2018). The effects of networked professional learning communities. *Journal of Teacher Education*, *70*(5), 441–452. https://doi.org/10.1177/0022487117753574 (Original work published 2019)

Raiker, A. (2020). Praxis, pedagogy and teachers' professionalism in England. *Center for Educational Policy Studies Journal, 10*(3), 11–30. https://doi.org/10.25656/01:20777

Ratcliffe, M., Bartholomew, H., Hames, V., Hind, A., Leach, J., Millar, R., & Osborne, J. (2005). Evidence-based practice in science education: The researcher–user interface. *Research Papers in*

Education, 20(2), 169–186. https://doi.org/10.1080/0267152050007803 6

Renkl, A. (2022). Meta-analyses as a privileged information source for informing teachers' practice? A plea for theories as primus inter pares. *Zeitschrift für Pädagogische Psychologie, 36*(4), 217–231. https://doi.org/10.1024/1010-0652/a000345

Ruzafa-Martínez, M., Molina-Salas, Y., & Ramos-Morcillo, A. J. (2016). Competencia en práctica basada en la evidencia en estudiantes del Grado en Enfermería [Competence in evidence-based practice among nursing degree students]. *Enfermería Clínica*, *26*(3), 158–164. https://doi.org/10.1016/J.ENFCLI.2015.06.002

Štemberger, T. (2020). Educational research within the curricula of initial teacher education: The case of Slovenia. *Center for Educational Policy Studies Journal, 10*(3), 31–51. https://doi.org/10.26529/cepsj.871

Tack, H., & Vanderlinde, R. (2016). Teacher educators' professional development: Towards a typology of teacher educators' researcherly disposition. *British Journal of Educational Studies*, *62*(3), 297–315. https://doi.org/10.1080/00071005.2014.957639

Thomm, E., Sälzer, C., Prenzel, M., & Bauer, J. (2021). Predictors of teachers' appreciation of evidence-based practice and educational research findings. *Zeitschrift für Pädagogische Psychologie, 35*(2-3), 54–66. https://doi.org/10.1024/1010-0652/a000301

Van der Linden, W., Bakx, A., Ros, A., Beijaard, D., & van den Bergh, L. (2015). The development of student teachers' research knowledge, beliefs and attitude. *Journal of Education for Teaching*, *41*(1), 4–18. https://doi.org/10.1080/02607476.2014.992631

Van Schaik, P., Volman, M., Admiraal, W., & Schenke, W. (2018). Barriers and conditions for teachers' utilisation of academic knowledge. *International Journal of Educational Research*, *90*, 50–63. https://doi.org/10.1016/j.ijer.2018.05.003

White, M. A., & McCallum, F. (2020). Responding to teacher quality through an evidence-informed wellbeing framework for initial teacher education. In J. Fox, C. Alexander, C., & T. Aspland (Eds.), *Teacher education in globalised times: Local responses in action* (pp. 115–137). Springer Singapore. https://doi.org/10.1007/978-981-15-4124-7_7

Williams, D., & Coles, L. (2007). Teachers' approaches to finding and using research evidence: An information literacy perspective. *Educational Research*, *49*(2), 185–206. https://doi.org/10.1080/00131880701369719

Wyer, R. S., & Albarracín, D. (2005). Belief formation, organization, and change: Cognitive and motivational influences. In A. Tesser, & N. Schwarz (Eds.), *The handbook of attitudes* (pp. 273–322). Lawrence Erlbaum Associates Publishers.

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