



La investigación educativa como elemento clave en el desarrollo de la competencia emprendedora

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RESUMEN

En los últimos años estamos asistiendo a un cambio de paradigma en el que el emprendimiento ha dejado de ser un fenómeno exclusivamente empresarial para convertirse en un fenómeno también educativo. El docente emprendedor se caracteriza por ser una persona creativa, innovadora, flexible, capaz de asumir riesgos y orientar su práctica hacia la mejora educativa. En esta investigación se plantea la hipótesis de que tener una alta percepción de importancia, implicación y competencia en la investigación educativa puede contribuir significativamente al desarrollo de competencias docentes emprendedoras, al proporcionarles los conocimientos y herramientas suficientes para orientar su práctica y permitirles tomar las mejores decisiones. Para probar esta hipótesis participaron en este estudio 397 docentes mediante la cumplimentación de la *Escala de Percepción hacia la Investigación Educativa y la Escala de competencias emprendedoras*. Los resultados de un análisis de moderación revelaron una serie de beneficios potenciales para los profesores universitarios y no universitarios. En concreto, se valoró cómo tener una mayor implicación en la investigación educativa y tener una mayor competencia en la investigación educativa contribuía a mejorar la autoeficacia y la proactividad, y la capacidad de afrontar riesgos y dificultades; ambas, dimensiones relacionadas con la enseñanza del emprendimiento.

Palabras Clave: Investigación educativa, práctica basada en evidencias, emprendimiento, métodos docentes, docencia reflexiva.

Educational research as a key element in the development of the entrepreneurial competence

ABSTRACT

In recent years we are seeing a paradigm shift in which entrepreneurship has ceased to be an exclusive phenomenon of the business field to become a phenomenon that is expanding to other areas, such as education. The entrepreneur teacher is characterized by being a creative, innovative, flexible person, capable of taking risks and guiding their practice towards educational improvement. In this research, it is hypothesized that having a high perception of importance, involvement and competence in educational research can contribute significantly to building entrepreneurial teachers' competences, by providing them with enough knowledge and tools to guide their practice and allow them to make the best decisions. To test this hypothesis, 397 teachers took part in this study by filling in the *Scale of Perception towards Educational Research and the Scale of entrepreneurial competencies*. Findings from a moderation analysis revealed a series of potential benefits for both non-university and university teachers. Specifically, it was appreciated how having a higher involvement with educational research and having a greater competence in educational research contributed to improving the self-efficacy and proactivity, as well as the ability to facing risks and difficulties – both dimensions being related to teaching entrepreneurship.

Keywords: Educational research, evidence based practice, entrepreneurship, teaching methods, reflective teaching.

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Introduction

Cantillon (1732) was the first person that used the term entrepreneur in the economic field to refer to the person capable of taking risks under conditions of uncertainty. Years later, Drucker (1985) complemented this term by considering entrepreneurship as a more psychological and behavioural characteristic of the individual. This characteristic would include the ability to seek change, the ability to respond to such changes, and the ability to exploit the response as an opportunity.

Although in recent years entrepreneurship is a concept that has been gaining special attention, even today it remains a concept without a commonly accepted definition in the scientific community (Nuñez y Nuñez, 2016). Although there is not a full terminological consensus around the concept of entrepreneurship (Hoffmann et al., 2012), the vast majority of definitions include as key elements of an entrepreneur the ability to transform ideas into actions through creativity, innovation and risk taking, search for opportunities, initiative, commitment, take control, ability to work in a team, strategic thinking, negotiation skills, as well as the ability to plan and manage projects (European Parliament and Council of the European Union, 2006; Gibb & Hannon, 2007; Kirby, 2004). This is considered a transversal and key competence for all humans, useful in personal, social and professional areas of individuals' life (European Parliament and Council of the European Union, 2018).

As shown, initially it was associated with the business field, but with the passage of time entrepreneurship has been opening barriers to other social, political and cultural fields (Zhang, 2017). In the educational field, in recent years, coined as *teacherpreneur*, it has been understood as the teacher who is committed to educational change, passionate about his work, charismatic, confident, flexible, responsible, capable of daring to break the pre-established rules and taking risks, as well as orient their work to the student and to action (Berry et al., 2013; European Commission, 2014). This term was introduced by Berry et al. (2013) into academic writing for describing those teachers capable of developing and 'selling' their teaching talent whereas they find innovative alternatives and solutions to the challenges that their classrooms demand. What is more, Arruti (2016) claims that the characteristics of a *teacherpreneur* are closely linked with the characteristics of entrepreneurs outside the educational field.

At this point a new question that must be resolved arises: can entrepreneurship be taught? And although the debate is still active, some of the most representative figures in the field, such as Drucker (1985, p. 34), points out that "entrepreneurship is not magic, it is not mysterious, and it has nothing to do with genes. It is a discipline. And, like any discipline, it can be learned". This idea that entrepreneurship needs to be practiced so as to be learned has been highlighted several times in the literature (e. g. Crittenden et al., 2015; Kuratko, 2005; Volkmann, 2004).

This idea becomes much more important when we expose the impact that globalization is having on education. This situation necessarily forces teachers to prepare students to meet the challenges of a changing and unpredictable environment (Neck et al., 2018). In this sense, authors such as Henry et al. (2017) point out that it is key to advocate for the implementation of solid training programs that allow teachers to develop the entrepreneurial skills necessary to respond to the challenges of the 21st century.

Blankesteyn et al. (2020) claim that entrepreneurship training should be built on a combination of theoretical knowledge and practical skills and experiences. Taking these two variables, the teachability dilemma arises (Mars et al., 2008): should the focus

of attention be placed on the theoretical teaching of entrepreneurship or should opportunities and practical experiences be offered? Although this dilemma remains unresolved, the literature shows a clear imbalance in favour of the practical part of entrepreneurship training programs (through educational techniques or practical tasks, among other activities), leaving aside, in the vast majority of cases, the theoretical knowledge that should be linked to this practice (Abreu et al., 2016; Arias et al., 2018; Arpiainen & Kurczewska, 2017; Neck et al., 2014a).

From previous research it is known that training in teaching entrepreneurship must be specially designed to develop creativity and innovation, to improve the motivation towards teaching work, to improve the awareness of one's own abilities and have confidence in oneself, to improve the willingness to accept challenges and recognize opportunities, and to improve communication skills and teamwork skills (Arruti, 2016).

In addition, previous studies show how being in possession of a good training in teaching entrepreneurship has a significant impact on entrepreneurial educational practices (Ruskovaara & Pihkala, 2013) and help teachers to use a greater number of active methodologies in teaching, like problem-based learning, project-based learning or cooperative learning, among others (Blimpo & Pugatch, 2021).

In any case, in recent years public institutions have taken a step in the creation of important national and international laws and reports that have among their purposes: (1) to support entrepreneurial initiatives in the educational, social, and economic fields (e.g. Law 14/2013); (2) to regulate teachers' training in entrepreneurship and to develop entrepreneurship competences in pre-service and in-service teachers (e. g. European Commission, 2014; European Commission, 2016; Law 14/2013); (3) and to introduce entrepreneurship as one of the key competencies to work with students (e. g. ECD/65/2015 Law; Organic Law 3/2020).

The vast majority of these laws (e. g. Organic Law 3/2020, among others) emphasize the need of teachers to promote research in the classroom as a means of generating sufficiently solid knowledge that allows teachers to make the best decisions in their educational practice. These changes in the education laws arise because indeed in the last years evidence-based decision making is growing in its acceptance in order to reduce the gaps between research and practice in fields like education, technology, sociology, or medicine, to cite a few (Cook et al., 2012; Pfeffer, 2010).

The evidence-based practice procedure emerged as a way of thriving in the medical field with the aim of improving outcomes and spread quickly to other fields, like sociology, education or technology, to cite a few (Coalition for Evidence-Based Policy, 2003), claiming that any type of evidence that may be helpful to support the practice. In this sense, Frese et al. (2012) state that a good practice should be based on solid evidence that includes a summary of several studies and several observations rather than only one observation or one study.

Nonetheless, in the educational field, by and large, the reality is quite different since our educational practices are commonly based on our experience as evidence-based decision making, among other reasons, requires more time (in training, in searching information...) than only acting by our intuition (Pfeffer, 2010). Noteworthy is the fact that recent studies have found that only 1 out of 4 teachers use some type of evidence for their lessons (Kippers et al., 2018), revealing a significant gap between scientific knowledge and the presence of it in educational decision making processes (Filderman & Toste, 2017). Some authors like Perines (2018) even coin this phenomenon as the "crisis of

educational research”, produced by the lack of training in educational research, perception of lack of transferability, or lack of confidence in educational research, among other reasons.

All these studies are not necessarily putting the experience aside on data-based decision making processes, but rather, experience is seen as an inherently idiosyncratic resource capable of serving as a guide to act on the resolution of a specific problem based on a specific case (Pfeffer, 2010). However, this experience needs to be empirically complemented with some forms of evidence (Frese et al., 2012; Mandinach, 2012).

In this context, the evidence-based entrepreneurship (EBE) concept arises as a science-informed entrepreneurship applied to different kinds of fields like medicine, criminology, education or sociology, among others (Frese et al., 2014). Evidence-based entrepreneurship encompasses the use of skills to use the most relevant scientific findings in order to improve the quality of the decision-making process making fact-based decisions (Pfeffer, 2010; Rousseau, 2012). When an entrepreneurial practice is based on data and evidence it looks for producing new knowledge in order to contribute significantly with the decisions, processes and activities of entrepreneurs (Stokes, 1997).

This idea is closely linked to the *action regulation theory* postulated by Hacker (1986), which holds that individuals regulate their behaviour through cognitive processes (Zacher & Frese, 2018). Based on this theory, it seems logical to think that being in possession of valuable information generated through educational research and mediated by a reflective process can serve as an incentive to modify the behaviour or the decisions made in educational practice. In fact, in recent years some light has been shed showing how the intention to get involved with educational research works as a mediating variable between the affective attitude towards educational research and the use of data in decision-making processes (Prenger & Schildkamp, 2018). This finding gives strength and complements the exposed theory.

In the literature, over the years, some potential benefits of the use of evidence-based decision-making also appear. For example, it seems that those teachers who apply scientific evidence to a greater degree in decision-making processes, adapt more successfully the didactic methodology to their students (Schildkamp & Ehren, 2012), their students’ academic performance is higher, especially that of those students from a low socioeconomic status (Van Geel et al., 2016) and the perceived quality of the centre is higher (Schildkamp & Ehren, 2012). Indeed, although evidence-based practice is not a panacea, it is linked to a greater degree with a social and political impact professional education (Pirrie, 2001).

Nevertheless, as claimed by Mandinach & Schildkamp (2020), if educational research’ findings are not correctly used, it is a hinderance. That is why some details should be commented. Firstly, Hammersley (2001), alludes to the importance of investigating the background of the study in which these conclusions were drawn, and not only the results, which is what the vast majority of teachers do. Secondly, this author alludes to the possible contradictions that may arise between scientific evidence and professional experience, generating this situation a greater degree of uncertainty for the teacher.

As stated previously, it can be seen that although educational research, when used improperly, can result in a dangerous tool, it is possible that teachers with better competence and involvement in educational research are more easily able to recognize the limitations of the various studies scientists, thus allowing them to take greater advantage in their decision-making process of those scientific works with a more solid structure. This idea, which, as has been seen, appears repeatedly in the literature, has

only been studied in a theoretical way, empirical evidence that studies the impact of educational research as a tool to improve teaching entrepreneurship skills, such as the competence to take risks and difficulties

Taking as a reference the entire theoretical framework previously exposed, the hypothesis of this research places us in a point of view in which it is thought that those teachers with a better perception and a greater competence in educational research will allow them to develop their entrepreneurial competence to a greater degree. This hypothesis is motivated because it is thought that those teachers who spend a greater amount of time reading and producing research generate a greater amount of useful data that allows them to make decisions and take risks about their educational practice in the most justified way possible. Thus, the objective of this research is to analyse the impact that educational research has on the development of teaching entrepreneurial competence.

Methodology

In the present work, a quasi-experimental cross-sectional investigation is carried out with a non-probabilistic sample design.

Following Galindo-Domínguez (2020), these types of designs are very common when it comes to measuring certain characteristics of a sample at a specific time only. As Álvarez-Hernández & Delgado-De La Mora, 2015, collect, this type of design has the advantage of being relatively inexpensive and little time consuming to obtain reasonable results in the short term. However, they also have the disadvantage of complexity in making causality inferences.

Sample

A total of 397 Spanish teachers have participated in the present work (Age = 34.40; SD = 10.86) with deep experience in the field of education (Years of Experience = 8.51; SD = 7.44). 111 (28%) were males and 286 (72.0%) females. Regarding the educational stage, 75 (18.9%) were teachers of early childhood education, 178 (44.8%) of primary education, 79 (19.9%) of secondary education, baccalaureate and vocational training, and 65 of university education (16.4%).

The final sample is the result of a design for intentional convenience followed in which teachers from 5 different autonomous communities participated: Basque Country, Galicia, Madrid, Catalonia and Cantabria. Despite their differences in training and pedagogical environment, it has been chosen to collect a sample of the different educational stages, precisely knowing that it is possible that there were significant differences in the main constructs studied and that they could lead to interesting results through the moderation analysis carried out later.

Instruments

A total of 3 instruments have been used, which are detailed below. The first instrument was a short ad-hoc instrument with a series of contextual variables. Specifically, the educational stage, years of experience, age and gender of the teacher were requested.

Second, to measure the perception of educational research, the *Scale of Perception towards Educational Research* (Galindo-Domínguez, et al., 2021) was used. This instrument is made up of three dimensions of perception towards educational research: *value* to educational research (items 1 to 11; e.g. “La investigación educativa ayuda a mejorar la forma en que el profesorado imparte clase”), *involvement* in educational research

(ítems 12 to 21; e. g. “Me intereso en buscar, revisar y aprender de estudios científicos que son de mi interés”), and *competence* in educational research (ítems 24 to 33; e. g. “Cuando he realizado una investigación, sé cómo plasmarla en papel (a través de un artículo, informe, ponencia, etc)”). The instrument is made up of a total of 30 items measured on a 5-point *Likert* scale and showed a good model fit values ($X^2/df = 2.25$; CFI = .914; RMSEA = .062; AIC = 1233.66) and reliable dimensions (from $\alpha = .888$ to $\alpha = .917$).

Finally, to measure the perception of teaching entrepreneurship, the *Scale of entrepreneurial competencies* (Sánchez-García & Suárez-Ortega, 2017) was administered. This scale is made up of four dimensions: *Self-efficacy & proactivity* (ítems 1 to 9; e. g. “Haga lo que haga, tengo fe y seguridad en mí mismo/a y en que lo conseguiré”), *Assertiveness & emotional control* (ítems 10 to 16; e. g. “Soy capaz de captar las necesidades de mis estudiantes e incorporarlas en mis programaciones didácticas”), *facing risks & difficulties* (ítems 17 to 19; “e. g. “Me cuesta afrontar la incertidumbre y los problemas imprevisibles”) and *participative leadership* (ítems 20 to 22; e. g. “Al ejercer el liderazgo, me parece fundamental rodearme de personas con mucho talento”). The scale was made up by a total of 21 items measured on a 5-point *Likert* scale and validated to Spanish by Sánchez-García & Suárez-Ortega (2017), claiming optimal, although improvable, indices for educational research (RMSEA = .091; IFI = .812; TLI = .765; CFI = .808).

Procedure

Initially, the most relevant instruments were selected to achieve the initial objective. In this sense, the instruments were selected based on their optimal validity and reliability. Subsequently, a database of potential participants was made, accepting teachers from different places from Spain (Basque Country, Galicia, Madrid, Catalonia and Cantabria), from the different stages of the educational system. This intentional selection process was carried out through a non-probability convenience sampling technique. Once the database was made, the authors contacted all the participants, who were informed of the tasks and conditions of participation in the work. At this point, all the ethical principles that were to be respected throughout the data collection and processing process (information protection, data processing, possibility of non-participation, anonymity and privacy) were highlighted. Finally, after collecting all the data, the relevant statistical analyses were performed using the *SPSS Statistics 23*, *SPSS AMOS 23* and *Process 3.5* softwares.

Data analysis

The data analysis path followed a systematic procedure. At first, the means, standard deviations, correlations and reliability indices were studied. Subsequently, and taking this first step as a reference, the model fit of the theoretical model was studied through the absolute, incremental and parsimonious indices (X^2/df , CFI, RMSEA and AIC). The pertinent modifications were made through the study of the modification indices and the factor loadings of the different items. Finally, a moderation analysis was carried out to determine the causality between educational research and teaching entrepreneurship throughout the educational stage. For this purpose, the educational stage variable was encoded dichotomously, observing a certain degree of affinity between non-university teachers on the one hand and university teachers on the other.

Results

At first, a descriptive study of the model with which it was going to work was carried out. In this sense, as shown in Table 1, all the dimensions, both of *perception towards educational research* and of *teaching entrepreneurship*, obtained optimal reliability values, except for the dimension of *participative leadership*. This dimension consisted of 3 items and after studying the *alpha if item deleted* values, the reliability did not improve to recommended levels of .70. In this sense, the values of *alfa if item deleted* were not optimal for conducting research (item 20; $\alpha = .331$; item 21, $\alpha = .319$; item 22 = .521). In view of these results, it was decided to delete this dimension. The elimination of this dimension is also justified from the theory in that different models based on the development of entrepreneurial competence, such as the *Entre-Comp* model (European Commission, 2016b) do not refer to the eliminated dimension.

With regard to the means, it was observed how the lowest values were obtained in the *Competence* in Educational Research and in *Involvement* in Educational Research. In addition, the vast majority of dimensions correlated positive and significantly, except for the *Facing risks and difficulties* dimension.

At first, the model fit was studied. In this sense, it was observed how the model fit of the theoretical structural equation model was adequate ($X^2 / df = 1.87$; CFI = .907; RMSEA = .047; AIC = 2319.68), in that $X^2/df < 3$; CFI > .90 and RMSEA > .05 (Kenney, 2020).

Table 1
Descriptive statistics, correlations and reliability values of the main dimensions.

	M	DT	α	1	2	3	4	5	6	7
VAL	4.43	.560	.912	-	.520**	.233**	.353**	.446**	.408**	-.071
INV	3.68	.766	.894		-	.659**	.468**	.416**	.260**	-.039
COM	3.04	.995	.938			-	.366**	.246**	.124*	.035
SEP	4.19	.546	.847				-	.609**	.415**	.235**
AEM	4.40	.488	.788					-	.479**	.036
PLE	3.11	.963	.511						-	-.116*
FRD	4.28	.613	.735							-

Note. Val, Value; Imp, Involvement; Com, Competence; SEP, Self-efficacy & Proactivity; AEM, Assertiveness & Emotional control; PLE, Participative Leadership; FRD, Facing risks and difficulties. * $p < .05$; ** $p < .01$.

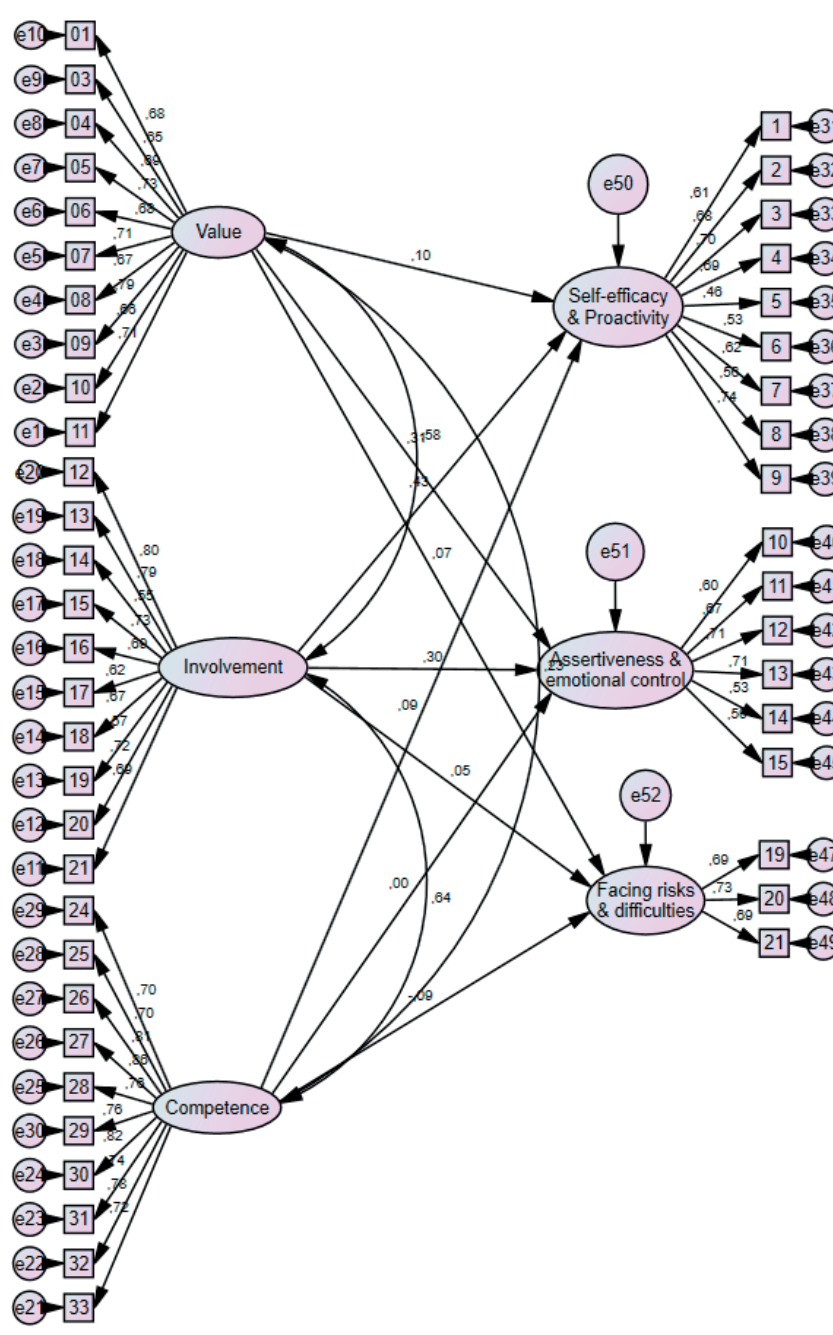


Figure 1. Structural equation model from Perception towards Education research towards Teaching entrepreneurship

After these analyses, it was studied the causality between the educational research and the teaching entrepreneurship. As hypothesized, the educational stage could be an important variable in this equation. That is why, it was considered as part of the moderation analysis.

The educational stage was codified in 4 categories according to Spanish education system: Early childhood teacher (0-6 years), primary education teacher (6-12 years), secondary education teacher (12-18 years) and university teacher (18+ years), but in view of the barely any differences found in the ANOVA analysis (see Table 2) amongst the non-university teachers, it was decided to join early childhood teachers, primary education teachers and

secondary education teachers in one group and university teachers in another group.

The results from the ANOVA analysis gathered in the Table 2 show how there were significant differences in favour of university teachers in all dimensions of the *Scale of Perception towards Educational Research*, as well as in the dimension of self-efficacy and proactivity, again, in favour of university teachers. No statistically significant differences were found in assertiveness and emotional control and facing risks and difficulties dimensions.

Finally, a moderation analysis between perception towards educational research and entrepreneurship by educational stage was carried out. In this analysis the different dimensions of the

Table 2
ANOVA amongst the teachers of different educational stages.

Dimension	p	η^2	(Tukey's Post-Hoc)
Value	.000	.046	(2<4)(3<4)
Involvement	.000	.231	(1<3)(1<4)(2<3)(2<4)(3<4)
Competence	.000	.346	(1<3)(1<4)(2<3)(2<4)(3<4)
Self-efficacy & proactivity	.000	.054	(1<4)(2<4)
Assertiveness & emotional control	.105	.015	-
Facing risks & difficulties	.638	.004	-

Note. 1, Early Childhood education teachers; 2, Primary education teachers; 3, Secondary education teachers; 4, University teachers.

perception towards educational research were considered as independent variables, the different dimensions of the teaching entrepreneurship were considered as dependent variables and the educational stage was considered as moderator variable. For this analysis a total of 10,000 bootstrapping samples was used and -1SD, Mean, +1SD *pick-a-point* technique was used.

All the data, gathered in Table 3, revealed some significant linear regressions, in some cases, moderated by the educational stage. With regard to the *self-efficacy & proactivity* dimension, it was observed how it was tendentially predicted by the *Competence* in educational research and significantly predicted by *involvement* in educational research, regardless of the educational

stage of teachers, as non-significant interaction values pointed out. With regard to *assertiveness & emotional control*, it was not predicted by any of the dimensions of perception towards educational research. Lastly, with regard to *facing risks & difficulties*, this analysis revealed that *competence* in educational research predicted significantly the dimension of *facing risks & difficulties* and it is moderated by educational stage in favour of university teachers in comparison with non-university teachers. In addition, even though *involvement* in educational research does not predict statistically significantly *facing risks & difficulties* dimension, it is moderated by educational stage in favour of university teachers in comparison with non-university teachers.

Table 3
Moderation analysis when educational stage as moderator

	R ²	β	p	SE	LLCI	ULCI	Int (p)	θ
<i>(DV: Self-efficacy & Proactivity)</i>								
Value	.126	-.011	.955	.188	-.379	.358	.115	-
Involvement	.221	.270	.039	.131	.013	.527	.564	-
Competence	.125	.219	.053	.113	-.003	.440	.821	-
<i>(DV: Assertiveness & Emotional Control)</i>								
Value	.160	.232	.147	.160	-.082	.547	.529	-
Involvement	.162	.135	.252	.118	-.097	.367	.232	-
Competence	.052	.075	.386	.087	-.168	.232	.386	-
<i>(DV: Facing risks & difficulties)</i>								
Value	.016	-.299	.393	.349	-.986	.388	.186	-
Involvement	.018	-.340	.189	.258	-.846	.167	.071	NUT: $\theta = .062$; p = .416 UT: $\theta = .463$; p = .027
Competence	.024	-.573	.006	.209	-.984	-.163	.005	NUT: $\theta = -.071$; p = .262 UT: $\theta = .432$; p = .010

Note. NUT, Non-university teachers; UT, University teachers; DV, Dependent variable.

Discussion

The objective of this work has been to verify the potential benefits that educational research can have on teaching entrepreneurship. The starting hypothesis was based on the fact that a greater degree of knowledge generated through scientific ev-

idence can contribute to developing a greater entrepreneurial competence in teachers at all educational stages, by allowing them to base their decisions on scientific evidence and not only on their own experience. In this sense, the findings have partially supported this hypothesis, insofar as two important results have been observed.

On the one hand, regardless of the educational stage, getting involved with educational research and having a greater competence in educational research contributes to significantly developing a better perception of self-efficacy & proactivity in relation to their teaching practice compared to those who do not share this research vision. On the other hand, the findings suggest that only in the case of university teachers, being involved to a greater degree with educational research, as well as having a greater degree of competence in educational research contributes to significantly developing the degree of facing risks and difficulties, typical of any entrepreneurship model. These results are complementary to other studies that show that teachers that follow an evidence-based or data-based practice permit to improving students' outcomes in a greater degree (McNaughton et al., 2012; Poortman & Schildkamp, 2016; Visscher, 2020), although up until now it continues to be appreciated that the vast majority of evidence-based decisions in the educational field are made especially in the field of accountability, and not in the field of school development and in the instructional process (Schildkamp et al., 2016).

The results of the present investigation have a series of theoretical and practical implications. Firstly, these results make it possible to highlight the close relationship that exists between educational research and teaching entrepreneurship. From the previous literature it has been shown how amongst the best methods an entrepreneur has to generate knowledge there are, on the one hand when a research is carried out, the meta-analysis (Frese et al., 2012) and the randomized controlled experiment (Reay et al., 2009), and on the other hand when a research is not carried out a bibliographic search through databases such as Google Scholar, a tool we can use in order to access peer-reviewed academic journals to a person's fingertips (Pfeffer, 2010). Despite the fact that a high percentage of teachers state that one of the reasons why they are away from research is due to their lack of time, as stated by Pfeffer (2010), an evidence-based practice not necessary requires a lot of time in any event. In nowadays society where ICT are available in our environment, searching for the best data takes us little effort. In any case, it is found that in this process of searching and interpreting information, the institutional help provided to teachers to understand scientific studies has a significant impact on their research literacy (Pagan et al., 2019), as well as the help provided from peers and colleagues, which also seems to have a positive effect when discussing research findings (Means et al., 2010).

Secondly, in the literature, there are theoretical models for the development of entrepreneurial teaching competence, such as the model proposed by Neck et al. (2014a). From this model it can be seen how for a correct entrepreneurial training programme design it is essential that different types of practices must be carried out with the teachers: mainly, practices of play, practices of creation and practices of experimentation, in order to develop teacherpreneurs' self-efficacy & proactivity, and facing risks & difficulties dimensions, and practices of empathy, in order to develop teacherpreneurs' assertiveness & emotional control dimension. What is more, Arruti (2016) complements this model by stating that for each of these phases it would be pertinent to use a series of methodologies that to a greater degree allow the development of entrepreneurial competence. Among them, the author recommends the usage of collaborative learning, project-based learning, problem-based learning, case studies, experimentation, simulations, debate, and dialogue, amongst others. All these methodologies should lead to a reflective practice, in which each of the tasks carried out is worked from metacognition with the aim of going beyond surface learning and dive into

deep learning (Neck et al., 2014b). It is precisely at this point, and linked to our findings, that having a valuable information could lead to improvements in this reflective process. Indeed, as part of this process, authors like Frese et al. (2012) have suggested the usage of handbooks as an essential resource, but over time and as a consequence of the expansion of technology, a series of technological proposals (platforms, forums...) have emerged designed to bring scientific evidence closer to teachers, highlighting, among others, the What Works Clearinghouse (WWC) platform, the Best-Evidence Encyclopedia (BEE) or the Evidence for ESSA platform. All these platforms have the common objective of bringing what is scientifically proven to work to both pre-service and in-service teachers.

Thirdly, these results enhance the need for interdisciplinary groups, especially in educational centres, in order to bring them closer to the most recent scientific advances and promote research competence in them. As highlighted by the results obtained, this research competence can be key to developing the entrepreneurial skills of teachers. These groups should be made up of 4-6 teachers, a data expert, an assistant who acts as a leader, and an educational researcher. As stated by Schildkamp & Ehren (2012), this approach should follow a very defined structure: firstly, a problem that affects the educational centre is defined; secondly, some hypothesis concerning what causes the problem are established; thirdly, a data collection process is carried out to test the starting hypothesis, and after analysing and interpreting data, finally, some conclusions and improvement measures are drawn. Some previous research, following this pattern, have shown how being in possession of this knowledge has led to a significant change in the teaching staff in the methodology employed and to an improvement in the perceived quality of the centre (Schildkamp & Ehren, 2012). This change is necessary inasmuch as recent studies, like Belmonte et al. (2019) show how teaching staff still use a more traditional methodology with a theoretical approach for the treatment of entrepreneurial competence in the classroom. fact that can cause demotivation in their students. That is why choosing an appropriate methodology that allows teachers to develop their entrepreneurial skills, as well as promoting these skills among their students is essential. From previous work carried out in the field of higher education, it is known that in this process of working on entrepreneurial skills among students, it is necessary to pay special attention to students over 30 years of age, because they have lost a large part of study habits, as well as requiring a greater intellectual effort than the undertaking of the studies requires of them (Jiménez & Márquez, 2014).

Fourthly, in recent years, a series of national and international laws have emerged designed to promote evidence-based entrepreneurship. In the Spanish Law 14/2013, of September 27, to support entrepreneurs and their internationalization, part of the first chapter of Title I is dedicated to entrepreneurship education. These articles refer to the need to gradually acquire and develop entrepreneurial skills through initial training, as well as through life-long teacher training. Nonetheless, more striking is the Educator's handbook in which the European Commission (2014) present a series of key contributions to consider when designing courses that seek the development of entrepreneurial competence in pre-service teachers and in-service teachers. Among the competencies that this report considers key to develop entrepreneurial competencies are (1) the search for information, (2) the assumption and management of risks, (3) decision-making, (4) reflection and (5) critical thinking. As it has been appreciated by the findings of this study, it is possible that those people with better involvement and competence in educational research have developed to a greater degree these 5 competencies close-

ly linked to entrepreneurial competence, allowing them to score more highly in the main dimensions of entrepreneurial competition. It will be through future works how it will be possible to appreciate if these five key competences work as mediators between the existing causal relationship between educational research and entrepreneurial competence.

Finally, the present investigation is not exempt from limitations that must be taken into account in order to interpret the results in the best possible way. It is for this reason that the following lines are intended to explain the most significant limitations of the work.

On the one hand, the most important limitation of the work refers to the fact that the design of the work is cross-sectional. In this case, a data collection has been made at a specific time, analyzing the existing causality between variables. However, certain authors already point out that the most pertinent way to study the causality between the cause and the effect of a phenomenon is prioritizing longitudinal research designs (Woodward, 2013). In this sense, it could be interesting that future studies try to replicate the proposed theoretical model, studying the evolution of the constructs over time. Similarly, it could be interesting that future studies carry out pre-post studies to find out the impact that educational research programs have on the entrepreneurial competences of teachers.

On the other hand, with regard to the sample, it is true that there are certain clusters that have been better represented than others as it has been formed by intentional methods. In this sense, future studies could try to replicate the study by achieving a greater sample balance, in this case, further expanding the sample of early childhood and secondary education teachers and the sample of university education teachers; as well as by achieving a greater sample from a wide variety of autonomous communities, as well as from different countries.

Despite these limitations, it is hoped that the findings of the present work will serve to shed some light on the relationship between educational research and teaching entrepreneurship.

Conclusion

The objective of the present study has been to verify whether having a better perception of educational research could have potential benefits to develop entrepreneurial teaching competencies to a greater degree. This hypothesis arose from the fact that thanks to the findings of educational research, being in possession of this information could help teachers to make better and more informed decisions about their daily practice, thus promoting the professionalism of the teaching profession.

In this sense, the starting hypothesis has been partially fulfilled in that, as it has been gathered from the study's findings, it is appreciated that those teachers with greater involvement and competence in educational research develop entrepreneurial competences, such as self-efficacy and proactivity, or facing risks and difficulties. In some cases, it has been observed how the educational stage in which the teacher works functions as a moderating variable.

References

- Abreu, M., Demirel, P., Grinevich, V., & Karatas-Ozkan, M. (2016). Entrepreneurial practices in research intensive and teaching-led universities. *Small Business Economics*, 47(3), 695–717. <http://dx.doi.org/10.1007/s11187-016-9754-5>
- Álvarez-Hernández, G. & Delgado-De la Mora, J. (2015). Diseño de Estudios Epidemiológicos. El Estudio Transversal: Tomando una Fotografía de la Salud y la Enfermedad. *Bol Clin Hosp Infant Edo Son*, 32(1), 26-34
- Arias, E., Barba-Sanchez, V., Carrion, C., & Casado, R. (2018). Enhancing entrepreneurship education in a Master's degree in computer engineering: A project-based learning approach. *Administrative Sciences*, 8(4), 1-17. <https://doi.org/10.3390/admsci8040058>
- Arpiainen, R. L., & Kurczewska, A. (2017). Learning risk-taking and coping with uncertainty through experiential, team-based entrepreneurship education. *Industry and Higher Education*, 31(3), 143–155. <https://doi.org/10.1177%2F0950422217700994>
- Arruti, A. (2016). El desarrollo del perfil del teacherpreneur o profesor emprendedor en el currículum del grado de educación primaria: ¿Un concepto de moda o una realidad?. *Contextos Educativos*, 19, 177-194. <https://doi.org/10.18172/con.2770>
- Belmonte, J. L., Pozo, S., Fuentes, A., & Rodríguez, A. M. (2019). Análisis del desempeño docente en la educación para el emprendimiento en un contexto español. *Aula Abierta*, 48(3), 321-330. <https://doi.org/10.17811/rifie.48.3.2019.321-330>
- Berry, B., Byrd, A., & Wieder, A. (2013). *Teacherpreneurs: Innovative Teachers who Lead But Don't Leave*. John Wiley & Sons.
- Blankesteijn, M., Bossink, B., & van der Sijde, P. (2020). Science-based entrepreneurship education as a means for university-industry technology transfer. *International Entrepreneurship and Management Journal*. <https://doi.org/10.1007/s11365-019-00623-3>
- Blimpo, M. P. & Pugatch, T. (2021). Entrepreneurship education and teacher training in Rwanda. *Journal of Development Economics*, 149, 102583. <https://doi.org/10.1016/j.jdeveco.2020.102583>
- Cantillon, R. (1732) *Essai Sur la Nature du Commerce en General*. Macmillan.
- Coalition for Evidence-Based Policy. (2003). *Identifying and implementing education practices supported by rigorous evidence: A user friendly guide*. National Center for Education Evaluation and Regional Assistance.
- Cook, B. G., Smith, G. J., & Tankersley, M. (2012). Evidence-based practices in education. In K. R. Harris, S. Graham & T. Urdan (Eds.), *APA Educational Psychology Handbook Vol I* (pp. 493-526). American Psychological Association.
- Crittenden, V. L., Esper, K., Karst, N., & Segers, R. (2014). *Evolving entrepreneurial education: Innovation in the Babson classroom*. Emerald.
- Drucker, P. (1985). *Systemic Entrepreneurship in Innovation and entrepreneurship: Practice and principles*. Harper & Row.
- ECD/65/2015 Law, of January 21st, by which it is described the relationships between competencies, content and evaluation criteria for primary education, compulsory secondary education and high school. Official State Gazette, 25, 1st section of January 29th, 6986 to 7003. <https://www.boe.es/buscar/doc.php?id=BOE-A-2015-738>
- European Commission. (2014). *Guía del educador. La educación en emprendimiento*. Directorate General Enterprise and Industry.
- European Commission. (2016). *EntreComp: The entrepreneurship competence framework*. Publications Office of the European Union.
- European Parliament and Council of the European Union (2006). *Recomendación del parlamento europeo y del consejo de 18 de diciembre de 2006 sobre las competencias clave para el aprendizaje permanente*. Official Journal of the European Union.
- European Parliament and Council of the European Union. (2018). *Key Competences for Lifelong Learning*. Official Journal of the European Union.

- Filderman, M.J. & Toste, J.R. (2017). Decisions, decisions, decisions: Using data to make instructional decisions for struggling readers. *Teach. Except. Child.*, 50, 130–140. <https://doi.org/10.1177%2F0040059917740701>
- Frese, M., Bausch, A., Schmidt, P., Rauch, A., & Kabst, R. (2012). Evidence-based entrepreneurship: cumulative science, action principles and bridging the gap between science and practice. *Foundations and Trends in Entrepreneurship*, 8(1), 1-62. <http://dx.doi.org/10.1561/03000000044>
- Frese, M., Rousseau, D. M., & Wiklund, J. (2014). The emergence of Evidence-Based Entrepreneurship. *Entrepreneurship Theory and Practice*, 38(2), 209-216. <https://doi.org/10.1111%2Fetap.12094>
- Galindo-Domínguez, H. (2020). *Estadística para no estadísticos: una guía básica sobre la metodología cuantitativa de trabajos académicos*. 3Ciencias.
- Galindo-Domínguez, H., Perines, H., Valero, J. M., & Verde, A. (2021). Understanding and evaluating the teachers' perception towards Educational Research. Unpublished manuscript.
- Gibb, A. & Hannon, P. (2007). Towards the Entrepreneurial University. *International Journal of Entrepreneurship Education*, 4, 73-110.
- Hacker, W. (1986). *Arbeitspsychologie. Psychische Regulation von Arbeitstätigkeiten*. Huber.
- Hammersley, M. (2001). Some questions about evidence-based practice in education [Paper presentation]. Annual Conference of the British Educational Research Association 2001, Leeds, UK.
- Henry, C., Hill, F., & Leitch, C. (2017). *Entrepreneurship education and training: the issue of effectiveness*. Routledge.
- Hoffmann, A., Fuglsang, T., & Vestergaard, L. (2012). *Measuring Entrepreneurship Education*. In *Entrepreneurship determinants: culture and capabilities*. European Commission. Publications Office of the European Union.
- Jiménez, M. L. & Márquez, E. (2014). Ir a la Universidad después de los 30: dificultades y factores facilitadores. *Aula Abierta*, 42, 1-8.
- Kenny, D. (2020, 5th June). Measuring Model Fit. *David Kenny*. <http://www.davidakenny.net/cm/fit.htm>
- Kippers, W. B., Wolterinch, C. H. D., Schildkamp, K., Poortman, C. L., & Visscher, A. J. (2018). Teachers' views on the use of assessment for learning and data-based decision making in classroom practice. *Teaching and Teacher Education*, 75, 199-213. <http://dx.doi.org/10.1016/j.tate.2018.06.015>
- Kirby, D.A. (2004). Entrepreneurship education: can business schools meet the challenge?. *Education + Training*, 46(8), 510-519. <https://doi.org/10.1108/00400910410569632>
- Kuratko, D. (2005). The emergence of Entrepreneurship Education: Development, Trends and Challenges. *Entrepreneurship Theory and Practice*, 29(5), 77-98. <https://doi.org/10.1111%2Fj.1540-6520.2005.00099.x>
- Law 14/2013, of September 27th, to support entrepreneurs and their internationalization. (2013). Official State Gazette, 233, 1st section, of September 28th, 78787 to 78882. https://www.boe.es/diario_boe/txt.php?id=BOE-A-2013-10074
- Mandinach, E. B. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educ. Psychol.*, 47, 71–85. <https://doi.org/10.1080/00461520.2012.667064>
- Mandinach, E. B., & Schildkamp, K. (2020). Misconceptions about data-based decision making in education: an exploration of the literature. *Studies in Educational Evaluation*, 100842. <https://doi.org/10.1016/j.stueduc.2020.100842>
- Mars, M. M., Slaughter, S., & Rhoades, G. (2008). The state-sponsored student entrepreneur. *Journal of Higher Education*, 79(6), 638. <https://doi.org/10.1080/00221546.2008.11772122>
- Mcnaughton, S. M., Lai, S., & Hsaio, S. (2012). Testing the effectiveness of an intervention model based on data use: A replication series across clusters of schools. *Sch. Eff. Sch. Improv.*, 23, 203–228. <https://doi.org/10.1080/09243453.2011.652126>
- Means, B., Padilla, C., Gallagher, L. (2010). *Use of Education Data at the Local Level: From Accountability to Instructional Improvement*. Department of Education.
- Ministry of Education. (2020). *Statistics of the Education*. Government of Spain.
- Neck, H. M., & Corbett, A. C. (2018). The scholarship of teaching and learning entrepreneurship. *Entrepreneurship Education and Pedagogy*, 1(1), 8-41. <https://doi.org/10.1177%2F2515127417737286>
- Neck, H. M., Greene, P. G., & Brush, C. G. (2014a). *Teaching entrepreneurship. A practice-based approach*. Edward Elgar.
- Neck, H. M., Greene, P. G., & Brush, C. G. (2014b). Practice-based entrepreneurship education using actionable theory. In M. H. Morris (Ed.), *Annals of Entrepreneurship Education and Pedagogy* (pp. 3-20). Edward Elgar.
- Núñez, L. & Núñez, M. (2016). Noción de emprendimiento para una formación escolar en competencia emprendedora. *Revista Latina de Comunicación Social*, 71, 1069-1089.
- Organic Law 3/2020, of December 29th, by which the Organic Law 2/2006, of May 3rd, of Education is modified (2020). Official State Gazette, 340, 1st section, of December 30th, 122868 to 122953. https://www.boe.es/diario_boe/txt.php?id=BOE-A-2020-17264
- Pagan, S., Magner, K., Thibedeau, C. (2019). Supporting data-driven decision making in a Canadian school district. *Int. J. Digit. Soc.*, 10, 1510–1515. <https://dx.doi.org/10.20533/ijds.2040.2570.2019.0187>
- Perines, H. (2018). ¿Por qué la investigación educativa no impacta en la práctica docente?. *Estudios sobre Educación*, 34, 9-27. <https://doi.org/10.15581/004.34.9-27>
- Pfeffer, J. (2010). Evidence-Based Management for entrepreneurial environments: faster and better decisions with less risk. Rock Center for Corporate Governance at Stanford University, 75, 1-19. <https://dx.doi.org/10.2139/ssrn.1564422>
- Pirrie, A. (2001). Evidence-based Practice in Education: The Best Medicine?, *British Journal of Educational Studies*, 49(2), 124-136. <https://doi.org/10.1111/1467-8527.t01-1-00167>
- Poortman, C. L. & Schildkamp, K. (2016). Solving student achievement problems with a data use intervention for teachers. *Teaching and Teacher Education*, 60, 425-433. <https://doi.org/10.1016/j.tate.2016.06.010>
- Prenger, R. & Schildkamp, K. (2018). Data-based decision making for teacher and student learning: a psychological perspective on the role of the teacher. *Educational Psychology*, 38(6), 734-752. <https://doi.org/10.1080/01443410.2018.1426834>
- Reay, T., Berta, W., & Kohn, M. K. (2009). What's the evidence on evidence-based management? *Academy of Management Perspectives* 23(4), 5–18. <https://doi.org/10.5465/amp.23.4.5>
- Rousseau, D.M. (2012). Envisioning evidence-based management. In D.M. Rousseau (Ed.), *The Oxford handbook of evidence-based management* (pp. 3–24). Oxford, U.K.: Oxford University Press.
- Ruskovaara, E. & Pihkala, T. (2013). Teachers implementing entrepreneurship education: classroom practices. *Education + Training*, 55(2), 204-216. <https://doi.org/10.1108/00400911311304832>
- Sánchez-García, M. F. & Suárez-Ortega, M. (2017). Design and Validation of a Skills Assessment Instrument for Managing Entrepreneurial Career. *Revista Iberoamericana de Diag-*

- nóstico y Evaluación, 45(3), 109-123. <https://doi.org/10.21865/RIDEP45.3.09>
- Schildkamp, K., Ehren, M. (2013). From "Intuition"- to "Data"-based Decision Making in Dutch Secondary Schools?. In Schildkamp K., Lai M., Earl L. (Eds) *Data-based Decision Making in Education. Studies in Educational Leadership* (pp. 49-67). Springer, Dordrecht.
- Schildkamp, K., Poortman, C., Luyten, H., & Ebbeler, J. (2016). Factors promoting and hindering data-based decision making in schools. School effectiveness and school improvement, 28(2), 242-258. <https://doi.org/10.1080/09243453.2016.1256901>
- Stokes, D.E. (1997). *Pasteur's quadrant—Basic science and technological innovation*. Brookings Institution Press.
- Visscher, A. J. (2020). On the value of data-based decision making in education: The evidence from six intervention studies. *Studies in Educational Evaluation*, 100899. <https://doi.org/10.1016/j.stueduc.2020.100899>
- Van Geel, M., Keuning, T., Visscher, A. J., & Fox, J. P. (2016). Assessing the Effects of a School-Wide Data-Based Decision-Making Intervention on Student Achievement Growth in Primary Schools. *American Educational Research Journal*, 53(2), 360-394. <https://doi.org/10.3102%2F0002831216637346>
- Volkman, C. (2004). Entrepreneurship Studies – An Ascending Academic Discipline in the Twenty-First Century. *Higher Education in Europe*, 29(2), 177-185. <https://doi.org/10.1080/0379772042000234802>
- Woodward, M. (2013). *Epidemiology: study design and data analysis, 3rd Ed.* Champan and Hall/CRC.
- Zacher, H., & Frese, M. (2018). Action regulation theory: Foundations, current knowledge and future directions. In D. S. Ones, N. Anderson, C. Viswesvaran, & H. K. Sinangil (Eds.), *The SAGE handbook of industrial, work & organizational psychology: Organizational psychology* (pp. 122–144). Sage Reference.
- Zhang, D. (2017). Investigating the perception of university entrepreneurship education. *Journal of Entrepreneurship Education*, 20(2), 1-18.