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EDUCATORS' ENTREPRENEURIAL COMPETENCES: SCALE CONSTRUCTION AND VALIDATION

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ABSTRACT

The study aimed to construct and validate the Entrepreneurial Competences Scale for Educators (EntreCompSEdu). The basis for item generation was the EntreComp Framework, a document developed by the Joint Research Centre of the European Commission. The items were measured using a 5-point Likert scale.

To test the validity and internal consistency of the scale, item analysis, principal component analysis (PCA) and Cronbach's alpha were used. On a sample of Slovenian primary school teachers, PCA established EntreComSEdu, which had five subscales: Searching for ideas, Planning and realisation of one's ideas, Responsible behaviour, Initiative and Teamwork. The results indicate that EntreCompSEdu is a valid and reliable instrument for evaluating the entrepreneurial competences of educators.

Keywords: Educators, Entrepreneurial Competences, Scale, Principal Component Analysis, Internal Consistency, Validation.

INTRODUCTION

In 2006, the European Parliament issued the Recommendation of the European Parliament and the Council on Key Competences for Lifelong Learning, which identified a sense of initiative and entrepreneurship' as one of eight key competences (Recommendation, 2006). Since then, developing and promoting entrepreneurship education has been one of the key policy objectives of the European Union (EU) institutions and member states. Considering the current economic crises and the rapid changes that have transpired related to the complex knowledge-based economy and society, transversal skills such as entrepreneurship are essential not only to shape the mindsets of young people but also to provide the skills, knowledge and attitudes that are central to developing an entrepreneurial culture in Europe. However, it has been established that while some countries have already been committed to fostering entrepreneurship education for more than a decade, others are just starting (European Commission/EACEA/Eurydice, 2016). Although increasing efforts have been made to research and promote entrepreneurial competences, the adoption of the concept has been slower than expected (Ruskovaara, 2014).

The research on the implementation of the concept has so far been mostly focused on adapting the curriculum and teaching methods, and there have been few (or no) empirical studies on primary teachers' entrepreneurial competences (Ruskovaara & Pihkala, 2013). As there is also still no psychometrically sound instrument that can enhance the insight into educators' entrepreneurial competences, this study was conducted to construct and validate an instrument

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that would enable researchers to measure educators' entrepreneurial competences and provide relevant data for planning, implementing and evaluating an effective in-service training program that would empower educators by helping them develop entrepreneurial competences.

ENTREPRENEURSHIP EDUCATION

Entrepreneurship as a key competence has been further developed by the European Council on Key Competences for lifelong learning (2018). It defined entrepreneurship education as shown below.

Entrepreneurship education is about learners developing the skills and mindset [needed] to be able to turn creative ideas into entrepreneurial action. This is a key competence for all learners, supporting personal development, active citizenship, social inclusion and employability. It is relevant across the lifelong learning process, in all disciplines of learning and to all forms of education and training (formal, non-formal and informal) [that] contribute to an entrepreneurial spirit or behaviour, with or without a commercial objective.

The definition of entrepreneurial competence above indicates a dual focus. Firstly, the development of entrepreneurial attitudes, skills and knowledge should enable the individual to turn ideas into action. Secondly, entrepreneurship is related not only to economic activities and business creation but to other areas of life and society as well (Lackéus, 2015; McCoshan et al., 2010). In education, entrepreneurship has mostly been addressed on two levels: integration in the curriculum and through teaching methods. According to the Eurydice report (European Commission/EACEA/Eurydice, 2016), in the European countries where entrepreneurship has been integrated in education, some evidence of this can be seen in the curriculum. At the level of primary education, entrepreneurial education has been detected in the cross-curricular objectives, but entrepreneurial education is most common at the upper secondary level rather than on the primary level. It has also been established that over half of the European countries have very few or no guidelines for teaching methods supporting entrepreneurial education, and those that exist mainly pertain to the upper secondary level. They mostly include active learning and activities outside the classroom. However, according to Ruskovaara & Pikhala (2015), most of the studies that have analysed entrepreneurial education focused on the contents and methods used therein, and minimal research has been carried out on the effect of the teacher and his or her entrepreneurial-education background. The aforementioned authors also stressed that the role of the teacher as an operator and facilitator is likely important, or as stressed by the Report on Entrepreneurship Education (2011), teachers play a central role in entrepreneurial education. They need to be equipped with the right skills, knowledge and attitudes, however, to be able to provide their students with the new curricula, pedagogies and learning environments needed for them to acquire entrepreneurial competences. According to Draycott & Rae (2011), the teachers' background and context should be related to the level and contents of entrepreneurship education. Oikkonen & Pihkala (2013) also stated that because there are no clear-cut pedagogical guidelines for entrepreneurial education, to a large extent teacher are the ones responsible for integrating entrepreneurship education into their teaching. Solomon (2007) reported, however, that many teachers have difficulty finding contents and methods that they can use to implement entrepreneurship education. In addition, Jones & Iredale (2010) claim that a significant amount of research has been done on learners' entrepreneurial education activating methods, but the teaching perspective has been largely ignored. Also, the research has been primarily focused on higher education, which obviously cannot be simply transferred to basic education. Draycott et

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al., (2011) claim that there is a large research gap relating to the teachers' perspective on entrepreneurial education and to teachers' teaching methods for such subject matter at the lower levels. They also point out the lack of tools to support the development of teachers as entrepreneurship educators. However, Bacigalupo et al., (2016) presented the Entrepreneurial Competences Framework, which seems to provide a sound scaffold supporting the further development of entrepreneurial competences among educators.

ENTREPRENEURIAL COMPETENCES FRAMEWORK

The Entrepreneurial Competences Framework (EntreComp Framework) provides a common definition of entrepreneurship as a competence and aims to establish a bridge between the worlds of education and work and to be taken as a de facto reference by any initiative aiming to foster entrepreneurial learning. The framework is a flexible source of inspiration that can be used or adapted to support different contexts, such as the revision of formal education curricula and the development of approaches and methods that teachers can use to empower their learners with entrepreneurial competences (Bacigalupo et al., 2016).

The EntreComp Framework consists of three competence areas (Picture 1): (i) ideas and opportunities, (ii) resources and (iii) 'into action'. Each area includes five competences, which, together, are the building blocks of entrepreneurship as a competence. These 15 competences are built along an eight-level progression model. The framework also offers a comprehensive list of 442 learning outcomes, which are meant to provide insights that can serve as the starting point of the implementation of interventions in educational practice (Figure 1).

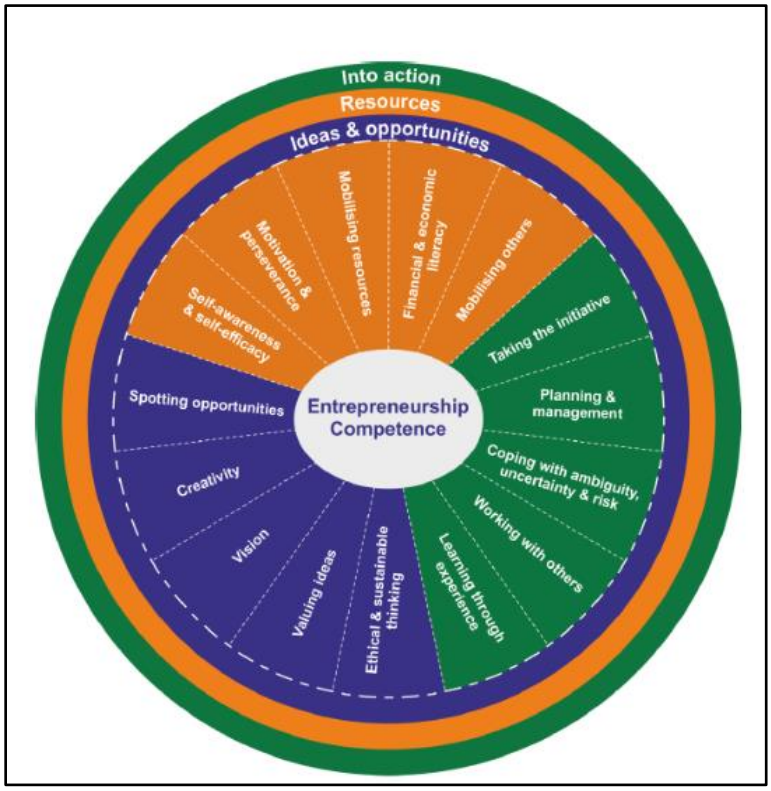

FIGURE 1
ENTRECOMP FRAMEWORK (Bacigalupo et al., 2016)

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Furthermore, it has been stated that the EntreComp Framework can serve as a reference for designing the curricula in formal and non-formal education. It aims to establish a bridge between the worlds of education and work as regards entrepreneurship as a competence, and to provide evidence-based scientific support to the European policymaking process (Bacigalupo et al., 2016)

THE AIM OF THE STUDY

Developing and promoting entrepreneurship education has been one of the key policy objectives of the EU institutions and member states for many years (European Commission/EACEA/Eurydice, 2016). Much of the research on such matter has been focused on the curriculum and on teaching methods rather than on the educators' perspectives and competences. Also, the research has been primarily focused on higher levels of education (Seeber, 2021), neglecting the fact that if the society wants to shape the mindsets of young people accordingly, entrepreneurial education should start with younger learners. Therefore, the aim of this study was to provide a psychometrically sound instrument for measuring educators' entrepreneurial competences and for suggesting evidence-based measures to empower educators in this area and based on this provide the model of entrepreneurial competences for school education in particular.

RESEARCH METHODOLOGY

Participants

The study included 889 primary school teachers, 10% of whom were male and 90% female. On average, the participants had 18.33 years' teaching experience (Standard Deviation [SD]=11.55). The vast majority (88.1%) had a bachelor's degree, and only 11.9% had a master's degree. Primary school teachers from all the seven geographic regions in Slovenia were included in the study.

Generating Items for the Entrepreneurial Competences Scale for Educators (EntreCompSEdu)

The basis for EntreComSEdu was the European document 'EntreComp into Action: Get Inspired' (McCallum et al., 2018). EntreComp is a comprehensive, flexible and multi-purpose reference framework designed to understand what is meant by entrepreneurship as a key competence for lifelong learning. It is intended to support and inspire actions to improve the entrepreneurial capacity of the European citizens and organisations and was launched as part of the New Skills Agenda for Europe. EntreComp creates a shared understanding of the knowledge, skills and attitudes that make up what it means to be entrepreneurial: discovering and acting upon opportunities and ideas and transforming them into social, cultural, financial or other value. As our intention was to design and validate the instrument that would be used as a self-assessment tool for Slovenian educators and bearing in mind that the EntreComp Framework is a general framework, in the process of designing the questionnaire, we paid special attention to its adaption to the specific sociocultural and educational context of Slovenia and also to the concept-oriented translation of competences into statements capturing the gist of each competence.

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The questionnaire included 24 items covering the three competence areas (ideas and opportunities, resources and 'into action'). The respondents were asked to rate the items on a 6-point scale, where 1=I do not strive to develop it; 2=I strive to develop it with the support of others; 3=I strive to develop it in cooperation with others; 4=I strive to develop it independently; 5=I am a competent, responsible developer; and 6=I strive to develop it with critical judgement. The questionnaire also consisted of one open-ended question (on work experience) and three closed-ended questions (gender, education level or degree and geographic region to which one belongs).

Data Analysis

For the 24 initial items, we first analysed the descriptive statistics, the correlation of each item with the total sum and the inter-correlations among the items. The analysis showed that all the items were satisfactorily linked with the total sum and were inter-correlated. As a result, all the 24 initial items were included in the further analysis. The parameters of validity of EntreCompSEdu were checked by carrying out principal component analysis (PCA) through the prior checking of the Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) and Batlett's test of sphericity. In addition, the internal consistency was explored using Cronbach's alpha.

RESULTS

Validity

According to Creswell (2014), there are three traditional forms of validity to look for: (i) content validity; (ii) concurrent validity and (iii) construct validity. The content validity of EntreCompSEdu is premised on the fact that the items were derived from the EntreComp into Action: Get Inspired document (McCallum et al., 2018). As our research on similar instruments yielded no results, we concluded that there are no similar scales and that the instrument's concurrent validity could therefore not be established. However, as the study was built on a well-grounded theory, EntreComp (McCallum et al., 2018; Leffler, 2020; Harris & Muijs, 2005), we chose to use PCA (Norušis, 2009) to test the construct validity of EntreCompSEdu.

Prior to factor analysis, the KMO was checked and the result of Bartlett's test of sphericity was analysed. The calculated KMO was 0.924, above the recommended value of 0.6 (Field, 2005), which indicates that factor analysis is appropriate for the dataset. The result of Bartlett's test of sphericity was χ^2=9,699.578 (df=276; p=0.000), suggesting the factor ability of the correlation matrix (Field, 2005).

To determine the number of factors, PCA with Varimax rotation was performed, and according to the Guttmann–Kaiser root one criterion, a five-factor solution was suggested. The scree plot suggested retaining only three factors, but due to the contents of factors 4 and 5 (taking initiatives and teamwork, which are considered important in entrepreneurship) we decided to keep the five-factor solution (Table 1). The items within each factor were retained when they exceeded +0.40. The five extracted factors explained 63% of the variance. The first factor accounted for 40.41% of the variance, which is above the 20.0% recommended variance, and indicates the appropriate construct validity of the scale (Field, 2005).

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Table 1
TOTAL INITIAL EIGENVALUES

Component	Eigenvalue	% of variance	Cumulative %
1	9.699	40.414	40.414
2	1.791	7.463	47.877
3	1.321	5.503	53.380
4	1.183	4.930	58.310
5	1.090	4.540	62.850

Table 2
FACTOR LOADINGS OF THE ENTREPRENEURIAL COMPETENCES SCALE FOR EDUCATORS (EntreCompSEdu)

	1	2	3	4	5
I strive to develop ideas.	0.762				
I try out my ideas.	0.760				
I strive to realise my ideas.	0.740				
I strive to develop creativity.	0.721				
I strive to discover opportunities for sociocultural development in school.	0.480				
I set short-, medium- and long-term goals.		0.728			
I strive to realise my short-, medium- and long-term goals.		0.704			
I am financially and economically literate.		0.626			
I use the necessary resources to realise my ideas.		0.575			
I obtain the necessary resources to realise my ideas.		0.552			
I plan the necessary resources to realise my goals.		0.521			
I try to achieve my goals independently.		0.496			
I am an ethical and sustainable thinker.			0.808		
I work in accordance with ethics and sustainability.			0.779		
I strive to develop empathy.			0.612		
I strive to develop the ability to act in solidarity with others.			0.547		
I can be self-restraining.			0.486		
I take initiatives.				0.756	
I accept challenges.				0.721	
I make decisions fast and flexibly.				0.653	
I trust in my abilities.				0.553	
I work in teams.					0.828
I learn from my experiences and include others in my learning.					0.725
I strive to develop teamwork.					0.538

Factor 1 (Table 2) of EntreCompSEdu consists of five items with factor loadings from 0.762 to 0.480, and accounted for much of the total variance (40.41%). The item analysis suggested that the factor measures one's perception about developing ideas and creativity, realising one's ideas and discovering opportunities for development on different levels, so we named it Searching for ideas. Generating new ideas is also understood as a creative approach to problem solving and is also connected to the ability to keep the generation and innovation process going. The concept of searching for ideas is closely connected to creativity, which refers to the ability to think in new and imaginative ways, with the understanding that creativity is not innate but is something that can be learned (De Bono, 1992; Redecker et al., 2011; Runco, 1991). Also, creativity is closely connected with the concept of creative thinking, which, based on flexibility (generating different ideas), fluency (generating a large amount of ideas), elaboration

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(developing ideas precisely and sharing them with others) and originality, leads to the development of new approaches, perspectives or solutions (Cropley, 2001).

Factor 2 (Table 2) consists of seven items and accounted for 7.47% of the variance. The factor loadings varied from 0.728 to 0.496. The factor included items connected to setting and realising one's short-, medium- and long-term goals and also to obtaining financial and other resources to realise one's ideas and goals. This factor was therefore named Planning and realisation of one's ideas. The ability to plan and structure tasks enables one to put ideas into action, also considering the actual circumstances and resources (European Commission/EACEA/Eurydice, 2016). Amabile (1988) claims that much focus has been put on generating ideas rather than on implementing them. Moreover, little attention has been given to the possibility that the factors that promote the suggestion of ideas may significantly differ from those that encourage their implementation (Amabile, 1988; Unsworth, 1999; Unsworth, 2001). In addition, the implementation of ideas is heavily reliant on the involvement of others as it depends on the approval, support and resources of others (Van de Ven et al., 1989). According to the results of the present study, the process of implementation includes setting goals, realising and achieving them and planning, obtaining and using the resources needed to achieve one's set goals.

Factor 3 (Table 2) consists of five items with loadings from 0.808 to 0.486 and accounted for 5.50% of the variance. The items indicated by load factor 4 refer to educators' ethics, sustainable thinking, empathy and ability to act responsibly in relation to oneself and one's environment, so we named it Responsible behaviour. This factor refers to the ability to cope with uncertainty and risks, but it also includes the role of entrepreneurs in society, with a special emphasis on understanding ethics in business and the role of entrepreneurship in addressing global issues (European Commission/EACEA/Eurydice, 2016). Responsible behaviour depends on an individual's sociocultural background and organisational and societal context (Vallaster et al., 2019). The concept of responsible behaviour is always embedded in the context of expectations within the society and of individuals' value set on ethical principles (Tokarski, 2009) and beliefs on sustainability, solidarity and empathy.

Factor 4 (Table 2) consists of four items and accounted for 4.93% of the variance. The range of factor loadings was from 0.756 to 0.553. As the items refer to taking initiatives, accepting challenges and fast and flexible decision making, we labelled the factor Initiative. European Commission/EACEA/Eurydice (2016) considers a sense of initiative at the core of entrepreneurship education and largely connected to problem solving or being pro-active. Unsworth & Parker (2003) define initiative as a form of proactivity or as taking an active and self-starting approach to work and going beyond what is formally required in a given situation. According to Binnewies et al., (2007), personal initiative is important in the beginning of the creative process and for idea creativity, but Frese et al., (1996) claim that initiative is important in the whole creative process. The Report on Entrepreneurship Education (2011) stresses that in most cases the availability of entrepreneurship education depends to a very high degree on the initiative of individual teachers as this is the way in which entrepreneurship education has traditionally been developed and sustained.

Factor 5 (Table 2) consists of three items and accounted for 4.54% of the variance. The range of loadings was from 0.828 to 0.538. The contents of the items correspond to teamwork and working with others, so the factor was named Teamwork. Teamwork is considered an essential skill for entrepreneurship and is related to communication, negotiation and decision making (European Commission/EACEA/Eurydice, 2016). It also contributes to an individual's

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personal and professional growth. However, although it may seem that teamwork is a well-established practice in education, it is important to point out that it can be realised only if one is motivated to work closely with others, to share his or her ideas with others and accept others' ideas and to share one's knowledge and expertise with others (Zhou & George, 2001). Teamwork needs to be thoroughly planned, implemented and evaluated (Pavlič Škerjanc, 2013; Peltonen, 2015; Schmiemann, 2012).

Reliability

Table 3
CRONBACH'S ALPHA FOR THE FACTORS AND FOR EntreComSEdu

Subscale	F_1	F_2	F_3	F_4	F_5	EntreComSEdu*
Number of items	5	7	5	4	3	24
Cronbach's alpha	0.852	0.859	0.818	0.735	0.716	0.934

**Separate items*

The Cronbach's alpha (Table 3) for the 24-item scale (α=0.934) demonstrates high internal consistency. Analysing the internal consistency of the subscales, we found three of them very highly reliable: Searching for ideas (F1) (α=0.852), Planning and realising one's ideas (F2) (α=0.859) and Responsible behaviour (F3) (α=0.818). The Initiative (F4) and Teamwork (F5) subscales demonstrated moderate internal consistency (α=0.735 and 0.761, respectively).

CONCLUSION

The aim of the present study was to construct and validate the Entrepreneurial Competences Scale for Educators (EntreCompSEdu). The final version of the scale consists of 24 items, which, based on PCA, spanned five factors: Searching for ideas (F1), Planning and realisation of one's ideas (F2), Responsible behaviour (F3), Initiative (F4) and Teamwork (F5). The first factor accounted for 40.41% of the variance, and the cumulative total explained 62.86% of the variance. The reliability values of the factors ranged from 0.735 to 0.859. Thus, we can conclude that the scale has excellent validity and satisfactory reliability. The results indicate that EntreCompSEdu can be useful as a reference tool for further research on educators' entrepreneurial competences, serving as an important basis for assessing the level of educators' entrepreneurial competences and determining the future developmental path in the field. As entrepreneurship education requires major changes in the way teachers themselves are educated (Report on Entrepreneurship Education, 2011), teacher education institutions need relevant research on the current state of entrepreneurial education in Europe, which will enable researchers and developers to plan further steps in developing entrepreneurial attitudes, skills and knowledge and thus empower individuals to translate their ideas into action and to help shape the entrepreneurial mindsets of young people. The psychometrically sound instrument for measuring educators' entrepreneurial competences that was developed represents a promising starting point. The instrument was developed as a part of a national project on developing entrepreneurial competences for primary school learners and teachers, which indicates that the possible generalisations based on this study are limited as all the participants belonged to the a specific (Slovenian) educational and cultural environment. In the future, it seems reasonable to enlarge the size and heterogeneity of the sample and to include educators from other countries, thus conducting the study in the international context. The latter will not impede the scale's

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usefulness as a tool for personal evaluation and for the targeted development of educators' entrepreneurial competences within the systems of initial teacher education and continuous professional development.

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