

**NEEDS ANALYSIS RESEARCH  
ON THE CREATIVITY AND  
ENTREPRENEURSHIP  
COMPETENCIES  
LEVEL ASSESSMENT  
GLOBAL REPORT BOOK**

**BEYOND THE LIMITS**  
Developing Entrepreneurship via Creativity in Schools

2020-1-TR01-KA203-093989

*Editors*

**Carlos Sousa Reis  
Albertina Oliveira, Diana Pinto  
Teresa Ribeiro Pessôa  
António Ferreira  
Giovanni Crisona  
Osman Titrek**



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ENTREPRENEURSHIP COMPETENCIES LEVEL ASSESSMENT  
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SCHOOLS PROJECT  
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## FOREWORDS

The EU “Developing Entrepreneurship via Creativity in Schools ([www.beyondthelimitsproject.sakarya.edu.tr](http://www.beyondthelimitsproject.sakarya.edu.tr))” project was initiated in 2019 and approved by the European Union to commence in 2020. The main objective is to develop entrepreneurial skills through creativity in education. The project started to implement with the grant support of the European Union in 2020, is a successful project carried out by a partnership of eight universities and institutes from seven countries across the UK, Spain, Portugal, Italy, Latvia and Romania under the coordination of Sakarya University from Türkiye within the scope of the Main Action (KA203) Strategic Partnerships Program in the 2020-2023 period within the scope of Erasmus + and we prepare a Need Analysis Global Report Book as an output. The COVID19 pandemic caused lockdown across Europe, and in consequence the organisation of the project was by virtual means during the first year. The leaders of the national partners brought together highly eminent and experienced researchers, innovators and educators from their countries.

During the project, we assessed the entrepreneurship and creativity levels of students, and aimed to develop university students' and teachers' creativity and entrepreneurial competences via education programs. The project aimed to encourage schools to place greater importance on entrepreneurship education and on organizing entrepreneurship activities to motivate young people to develop their potential, with competence development planned according to the specific needs of the age groups of students. It aimed to develop understanding and connectivity of the relationships between creativity and entrepreneurship, in education and in practice. In line with the main objective of this Project, student trainings, teacher training, dissemination activities in the form of international congresses, high school and university level curriculum development, as well as the needs analysis research, which is the main activity, have been carried out in partner countries and supported by global data, this report book explaining the situation of Entrepreneurship in Education in Europe and the World will be prepared and made available to researchers and educators all over the world in open access.

Through the dissemination of the project outputs, we hope that our project will be a "good practice example" for Türkiye and the EU. In this context, the fact that this report book, prepared as a needs analysis of the project, can be used in future studies by academics and researchers, relevant institutions and organizations all over the world and the possibility of being a source book will ensure the sustainability of the project. In this context, with the hope of producing a more qualified and entrepreneurial generation, with the hope of a world where this generation has a humane family and business life, and where they are more hopeful about the future; I would like to thank the University of Coimbra project team, who led the preparation of this book, and the project teams of other countries for their hard work and contributions to this valuable book. On this occasion, I wish that the outputs of this project will serve both our university, our region and humanity.

I would like to thank the rectorates of the universities of all partners, the Minister of National Education for their support in additional studies, the students who voluntarily filled our scales from seven countries, the students and teachers who participated in intensive programs, and the researchers and faculty members who took part in all project activities.

Prof. Dr. Osman TITREK

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### ***Framework of the analysis***

The project “Beyond The Limits: Developing Entrepreneurship via Creativity in Schools” (2020-1-TR01-KA203-093989), preview as first task to start being developed “**The need analysis of entrepreneurship and creativity levels of university students**”, to which was later added the high school students proficiency levels.

A preliminary study was undertaken in order to select the instruments sought apt to assess entrepreneurship and creativity as competencies. The discussion of the literature took as to select as reference the “EntreComp: The Entrepreneurship Competence Framework” (Bacigalupo et al., 2016). EntreComp Framework “has been developed through a mixed-methods approach, made up of a comprehensive review of academic and grey literature, an in-depth analysis of case studies, desk research and a set of iterative multi-stakeholder consultations” (Bacigalupo et al., 2016, p. 6). Nevertheless, the framework has not yet been adapted to, or tested in real settings, does requiring adaptation for implementing and evaluating it in a specific context.

EntreComp was meant to raise consensus around a common understanding of entrepreneurship, to improve their guidance and further an entrepreneurial mindset among citizens. It relies on the conviction that developing awareness about entrepreneurial skills, knowledge and attitudes, which are learnable, can also “widespread the development of entrepreneurial mind-sets and culture, which benefit individuals and society as a whole” (Bacigalupo et al., 2016, p. 5). Moreover, EntreComp Framework have produced a common definition of **entrepreneurship as a competence** – which components are knowledge, skills and attitudes (see Excursus). The document states that it gives an understanding of entrepreneurship as **transversal competence**, applying to all spheres of life, since nurturing personal development or actively participating in society, as well as (re)entering the job market as an employee or as a self-employed person, to the case of starting up ventures (cultural, social or commercial). Although it states the intention to bridge the worlds of education and work. The authors present a **conceptualisation of entrepreneurship as a competence**, and as a transversal key competence, of individuals, groups and even organisations, applying to all spheres of life and, namely, to the private, public and third sectors. And it is defined as follow: “Entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social (FFE-YE, 2012, cit. by Bacigalupo et al., 2016, p. 9).



As a flexible source of inspiration, EntreComp wants to be taken as a reference to foster reform of curricula (in a widespread range of settings, formal and non-formal, vocational, etc.), design practical entrepreneurial experiences or supporting the development of tools for citizens to self-assess their entrepreneurial proficiency. We want to underline this last aspect that refers to the definition of assessment instruments of entrepreneurship proficiency. In summary,

“The EntreComp Framework is made up of 3 competence areas: ‘Ideas and opportunities’, ‘Resources’ and ‘Into action’. Each area includes 5 competences, which, together, are the building blocks of entrepreneurship as a competence. The framework develops the 15 competences along an 8-level progression model. Also, it provides a comprehensive list of 442 learning outcomes, which offers inspiration and insight for those designing interventions from different educational contexts and domains of application” (Bacigalupo et al., 2016, p. 5).

EntreComp establishes an understanding of

“entrepreneurship competence as the ability to transform ideas and opportunities into action by mobilising resources. [Moreover] the 3 competence areas are tightly intertwined: entrepreneurship as a competence stands above all three of these together. The 15 competences are also interrelated and interconnected and should be treated as parts of a whole. [Thus implying that] entrepreneurship as a competence is made up of 15 building blocks” (Bacigalupo et al., 2016, p. 10).

EntreComp also refers that there are no core competences and that the 3 competence areas and the building blocks 15 competences can be represented as follows:



Figure 1: Areas and competences of the EntreComp conceptual model (Bacigalupo et al., 2016, p. 11).

EntreComp Framework progression mode defines as key characteristics of the learning outcomes that reflect the complexity, and can be used as a multi-purpose reference guide, requiring being tailored to the context of use. Besides, EntComp provides a reference for the development of proficiency, starting from value creation achieved through external support, up to transformative value creation; it acknowledges the strategic importance of seizing a window of opportunity. It offers a tool that can be adapted to different scenarios, which is not prescriptive, nor imposes the achievement of the highest level of competence, which pertains to expertise that is beyond average. The EntreComp Progression Model “breaks down the boundaries between education, work and civic engagement” (Bacigalupo et al., 2016, p. 15), being transversal to formal, non-formal and informal learning contexts. It establishes eight levels of achievement –Discover Explore Experiment Dare Improve Reinforce Expand Transform– as seen in Table 2.

*Table 1: EntreComp Progression Model*

Foundation		Intermediate		Advanced		Expert	
Relying on support <sup>d</sup> from others		Building independence		Taking responsibility		Driving transformation, innovation and growth	
Under direct supervision.	With reduced support from others, some autonomy and together with my peers.	On my own and together with my peers.	Taking and sharing some responsibilities.	With some guidance and together with others.	Taking responsibility for making decisions and working with others.	Taking responsibility for contributing to complex developments in a specific field.	Contributing substantially to the development of a specific field.
Discover	Explore	Experiment	Dare	Improve	Reinforce	Expand	Transform
Level 1 focuses mainly on <b>discovering</b> your qualities, potential, interests and wishes. It also focuses on <b>recognising</b> different types of problems and needs that can be solved creatively, and on developing individual skills and attitudes.	Level 2 focuses on <b>exploring</b> different approaches to problems, concentrating on diversity and developing <b>social skills</b> and attitudes.	Level 3 focuses on <b>critical thinking</b> and on <b>experimenting</b> with creating value, for instance through practical entrepreneurial experiences.	Level 4 focuses on <b>turning ideas into action in 'real life'</b> and on taking responsibility for this.	Level 5 focuses on <b>improving</b> your skills for turning ideas into action, taking <b>increasing responsibility</b> for creating value, and developing knowledge about entrepreneurship.	Level 6 focuses on working with others, using the knowledge you have to generate value, dealing with <b>increasingly complex challenges</b> .	Level 7 focuses on the competences needed to deal with <b>complex challenges</b> , handling a constantly changing environment where the degree of uncertainty is high.	Level 8 focuses on <b>emerging challenges</b> by developing new knowledge, through research and development capabilities to achieve excellence and transform the ways things are done.

As to the 442 learning outcomes, that comprise the complete framework (Annexe 3), they are statements of what a learner knows, understands and can do after completion of learning, which could “be used to guide the definition of tailored pedagogies, assessment methods, and learning environments that foster effective entrepreneurial learning.” (Bacigalupo et al., 2016, p. 17).

Due to the complexity of the full Progression Model, we have decided to use the EntreComp Overview (Bacigalupo et al., 2016, pp. 18-19), adapting it for a self-report perceptive assessment scale of entrepreneurship competencies, using only the “intermediate” level 15

items rated in 5 points likert scale, then on named “ENTRECOM Questionnaire on Entrepreneurship Perception – ECQS” (Annexe 4).

On the side of creativity analysis of the state of the art, it could be summarised by referring to the recent systematic literature review, undertaken by Said-Metwaly, Kyndt and Van den Noortgate (2017) that has produced just the kind of analysis we needed to find a walkthrough for the complex task of understanding and measuring creativity. The article gives an extended and substantial insight on the subject, relying on a review that includes creativity literature published in books and journals up to 31 December 2016, from 2,064 quantitative approaches published in English, from which 221 were sieved based on screening titles and abstracts, for then selecting 152 papers that met the inclusion criteria. The authors recognized that the concept is of complex and multidimensional nature and that there is no consensus on its definition, about which more than 100 definitions could be found. Some studies tend to employ only a few and others avoid providing any definition at all. Some refer to cognitive processes, others focus on personal characteristics, or the creative products and even interaction between the creative individual and the context or environment. This profiles four major approaches from which the correlative measurement instruments then are derived, namely: process, person, product, and press. Naturally, each approach has given a different and concurrent definition of creativity, hardly articulable.

Our analysis of creativity conceptualisation and means of assessment took us to recognise the complexity and complementarity of addressing both issues. So, in a first stance, it was proposed to opt for the “Inventory of Creative Activities and Achievements (ICAA)”, created by Diedrich and colleagues (2018), articulated with “The Runco Ideational Behavior Scale” (Ribs et al., 2011), as well as with with “KEYS: Assessment of climate for creativity” (Amabile et.al., 1995). Such choice was made on the principle of envisaging complementarity, while enhancing validity.

Now, a discussion between the partners, detected some difficulties regarding the appliance of the selected instruments, namely their length and availability. In consequence, it was then decided to apply the development of the “Kaufman Domains of Creativity Scale (K-DOCS) (Kaufman, 2012), which was authorized by the author. It should be reminded that K-DOCS just requires non-expert judges and no formal training, but simple guidance.

### **1.1. *Process definition for the adaptation and validation of instruments***

For the purpose of instruments’ adaptation and validation, the following protocol was designed and sent to each partner (Table 1).

*Table 1: Steps in Developing Needs Analysis WP*

<p><b>General objective:</b> To carry out the needs' analysis concerning creativity and entrepreneurship competences levels of University and High School students</p> <p><b>Operational objective:</b> To adapt and validate the appropriate instruments (EntreCom Questionnaire on Entrepreneurship for Students - ECQS_Short version - and Kaufman Creativity Scale for Students) for the target populations of the project in each participant country.</p>		
STEPS	TASKS	DATE
Step 1	<ul style="list-style-type: none"> <li>To selected the appropriate scales/instruments for assessing creativity and entrepreneurship in order to accomplish needs analysis.</li> </ul>	March 2021
Step 2	<ul style="list-style-type: none"> <li>To translate the scales/instruments to each partner language from the English version. This translation should be made by a native specialist fluent in English.</li> <li>To back translate the scales/instruments from each country language into English. This back translation should be made by a native English speaking fluent in the country language.</li> <li>To discuss the necessary improvements coming from divergences noted in the process of translation and back translation.</li> </ul>	April 2021
Step 3	<ul style="list-style-type: none"> <li>To pilot test ECQS (short version) and Kaufman Creativity Scale with minimum of 20 subjects from the target populations of the project in order to improve questionnaire clarity, questionnaire comprehensiveness and questionnaire acceptability, as well as in order to estimate response time (use the observation grid sent by University of Coimbra team).</li> <li>To analyse the data and make the necessary changes in the instruments to improve its quality.</li> </ul>	April 2021
Step 4	<ul style="list-style-type: none"> <li>To prepare the entire data collection protocol for the definitive data collection of the NA. Protocol in Giovanni Platform, informed consent, data-collection plan, answer storage links.</li> </ul>	May 2021
Step 5	<ul style="list-style-type: none"> <li>To carry out the NA study in each partner country with the target groups:</li> <li>High school students – N= 400; Higher education students – N=600</li> </ul>	May/June 2021
Step 6	<ul style="list-style-type: none"> <li>To analyse the data</li> </ul>	July/August 2021

A meeting was held between the partners to deem the process of analysis using the presentation “Workpage ‘Needs Analysis – Sampling – Demographics and analysis’, in Appendix 1.

### *1.2. Adaptation and validation of the instruments*

Regarding the study of the needs for developing entrepreneurial skills, the “ENTRECOM QUESTIONNAIRE - ON ENTREPRENEURSHIP PERCEPTION” was used, which the research group prepared based on the “EntreComp: The Entrepreneurship Competence Framework” (2016), considering the 15 items of the “intermediate” level of proficiency. Then it was translated into Italian, Latvian, Portuguese, Romanian, Spanish and Turkish. The instruments were originally available in English. The selected response scale for the items was the Likert scale, with 5 points, ranging between 1 (Completely Disagree), 2 (Disagree), 3 (Do not agree, Neither disagree), 4 (Agree) and 5 (Agree Completely).

#### *1.1.3. Pilot studies of ECQS*

In order to obtain the first reliability indicators of the questionnaire, we calculated Cronbach's alpha, which is used to measure the correlation between the answers given by the respondents, through the average correlation between each item and all the others. In other words, this indicator measures the internal consistency of items that are supposed to evaluate the same construct, namely the way the subjects respond to each item, convergent responses indicate consistency and the opposite inconsistency. The “ $\alpha$ ” coefficient is calculated from the variance of the individual items and the variance of the sum of the items of each evaluator of all items in a questionnaire that use the same measurement scale (Hora et al., 2010).

Responded to ECQS, in the academic month of April 2021, 17 students from several faculties of the University of Coimbra and from the Coimbra Business School answered all items, and a global value of  $\alpha = .849$  was obtained. Considering that the general rule dictates that a value of 0.70 and above is acceptable, 0.80 and above is good and 0.90 and above is excellent, we can say that the ECQS showed in this first study, with a small sample, a good overall level of reliability.

In Table 2, it can be seen that the means and standard deviations of the item between 3.47 and 4.35, that is, above point 3 (I do not agree, nor disagree).

*Table 2: Descriptive statistics of the 15 ECQS items*

	Mean	Standard Deviation	N
EntreComp1	4,0000	,70711	17
EntreComp2	3,8824	,69663	17
EntreComp3	4,1176	,60025	17
EntreComp4	4,3529	,60634	17
EntreComp5	4,1765	,63593	17
EntreComp6	3,5882	,93934	17
EntreComp7	4,0588	,74755	17
EntreComp8	3,7059	,46967	17
EntreComp9	3,4706	,87447	17
EntreComp10	3,7059	,98518	17
EntreComp11	3,7647	,83137	17
EntreComp12	4,0000	,50000	17
EntreComp13	4,2941	,46967	17
EntreComp14	4,2353	,66421	17
EntreComp15	4,2353	,56230	17

It is generally assumed that the coefficient values, for each item with the total, between 0.50 and 1 correspond to strong correlations; that values between 0.30 and 0.49 correspond to moderate or average correlations; and that when the value is below 0.29, there is a weak or low correlation. With regard to the internal correlation of the items, we can see in Table 3 that, among themselves, all the items have moderate or high correlations, except for the item “EntreComp4”, which has a weak correlation, although all the alpha values if item deleted, are above “ $\alpha$ ” = 0.8, which points to a good reliability of the ECQS scale, for measuring entrepreneurship for students, in this pilot study.

*Table 3: Item-total statistics*

Items	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
EntreComp1	55,5882	30,757	,574	,834
EntreComp2	55,7059	29,596	,749	,824
EntreComp3	55,4706	32,515	,421	,843
EntreComp4	55,2353	35,316	,010	,861
EntreComp5	55,4118	32,132	,447	,841
EntreComp6	56,0000	31,125	,358	,850

EntreComp7	55,5294	31,515	,439	,842
EntreComp8	55,8824	31,610	,743	,831
EntreComp9	56,1176	30,485	,467	,841
EntreComp10	55,8824	28,610	,586	,834
EntreComp11	55,8235	28,904	,689	,826
EntreComp12	55,5882	32,132	,595	,836
EntreComp13	55,2941	33,596	,357	,846
EntreComp14	55,3529	30,993	,585	,834
EntreComp15	55,3529	32,993	,379	,845

Beyond analysing quantitative data, the research team also collected qualitative data. Participants' comments were: "Relevant, well-formulated and clear questions, easy to understand and quick to respond"; "Accessible questionnaire, both in terms of language and in terms of the number of questions"; "Questions as a good form of introspection and self-knowledge". The length of the instrument was appreciated (8 min. corresponded to the time required) and the response scale to the items was considered appropriate. From the feedback obtained, only items four and five were slightly improved and stated as follows: 4. "I understand that ideas value depends on its applicability"; 5. "I am driven by sustainability concerns when making decisions". Moreover, the point three of the Likert response scale was also refined: "Don't agree nor disagree" instead of "I don't Know". In relation to K-DOCS, which was already validate by several studies, a retroversion and back translation process was used with the help of English native speaking experts.

### *1.3. Dissemination of the instruments and the answering process*

After this phase, the adapted and validated questionnaires were inserted in LimeSurvey, a free and open source on-line statistical survey web app, distributed under the GNU General Public License. The questionnaires were accessed through the following set of links, corresponding to each country partner different language:

- a. English (Base language): <https://survey.cscs.it/index.php/457117?lang=en>
- b. Italian: <https://survey.cscs.it/index.php/457117?lang=it>
- c. Latvian: <https://survey.cscs.it/index.php/457117?lang=lv>
- d. Portuguese: <https://survey.cscs.it/index.php/457117?lang=pt>
- e. Romanian: <https://survey.cscs.it/index.php/457117?lang=ro>
- f. Spanish: <https://survey.cscs.it/index.php/457117?lang=es>
- g. Turkish: <https://survey.cscs.it/index.php/457117?lang=tr>

Once the questionnaires were disseminated among secondary and higher education institutions, recipients had the opportunity to respond between November 2021 and July 2022. Some difficulties in getting authorisations delayed the process.

### 1.3. Guidelines defined for the statistical analysis

In line with the objectives of the survey, the following guidelines were prepared and disseminated among the various partners of the project (Table 4).

*Table 4: Guidelines for the statistical analysis of data from Needs Assessment*

Please, consider the following orientations for the codification of the several variables in the data collection protocol and for the statistical analysis. Sample N: minimum 250 HE, 250 HS; excellent 600 for each one.	
<b>Codification of the instruments' variables</b>	
PART I:  DEMOGRAPHIC INFORMATION	<p><b>NID</b> – Number of identification (just to identify each student)</p> <p><b>Gender:</b> 1- Male; 2- Female; 3- Other</p> <p><b>Age:</b> 1 - 15 and younger; 2 – 16; 3 – 17; 4 – 18; 5 – 19; 6 – 20; 7 – 21; 8 – 22 and older</p> <p><b>Education level:</b> 1 – High school 2 - Undergraduate 3 – Graduate</p> <p><b>High school type:</b> 1 - Vocational Hg. School 2 - Social Science 3 – Science 4 - Art &amp; Sport 5 - Other</p>



<p><b>PART II:</b></p> <p>ENTRECOM Questionnaire on Entrepreneurship Perception (15 items)</p>	<p>As in the data collection protocol:</p> <p>1 - Disagree Completely</p> <p>2 - Disagree</p> <p>3 - Neither agree nor disagree</p> <p>4 - Agree</p> <p>5 - Agree Completely</p>
<p><b>PART III:</b></p> <p>KAUFMAN Domains of Creativity Scale (K-DOCS) (50 items)</p>	<p>As in the data collection protocol:</p> <p>1 - Much Less Creative</p> <p>2 - Less Creative</p> <p>3 - Neither More nor Less Creative</p> <p>4 - More Creative</p> <p>5 - Much More Creative</p>
<p><b>Statistical analysis</b></p>	
<p>Statistical descriptive analysis</p>	<p>DEMOGRAPHIC variables:</p> <p>Compute for all the variables (that are nominal and ordinal):</p> <ul style="list-style-type: none"> <li>- frequency, %, and mode and put all the data in a frequency table;</li> <li>- compute a pie chart for gender and</li> <li>- compute bar charts for all the other variables</li> </ul>
	<p>ENTRECOM and K-DOCS items:</p> <p>Compute for all the items:</p> <p>Minimum, maximum, mean and standard deviation</p> <p>put all the data of the ENTRECOM Questionnaire in a table (4 columns)</p> <p>put all the data of the K-DOCS in a table (4 columns)</p> <p>Compute the SUM of all the items of:</p> <p>The ENTRECOM</p> <p>Each domain of the K-DOCS</p>

	<ul style="list-style-type: none"> <li>- Self/Everyday</li> <li>- Scholarly</li> <li>- Performance</li> <li>- Mechanical/Scientific</li> <li>- Artistic</li> </ul> <p>Compute a bar charts for the 5 K-DOCS domains</p>
Reliability analysis	<p>Concerning reliability analysis, ask for in SPSS (or equivalent program):</p> <p>Descriptives for Item</p> <p>Descriptives for Scale if item deleted</p> <p>Cronbach' Alpha</p> <p>The SPSS will generate automatically 3 tables ("Reliability statistics"; "Item statistics"; "Item-total statistics")</p> <p>The above procedure should be performed for:</p> <p>The 15 items of the ENTRECOM Questionnaire</p> <p>The 50 items of K-DOCS</p> <p>The items of each of the 5 dimensions of K-DOCS</p> <p>Put the value of each Cronbach' Alpha in a table</p>
Correlations analysis	<p>Compute in the total sample the Pearson correlations between:</p> <p>ENTRECOM total and K-DOCS total</p> <p>ENTRECOM total and each K-DOCS domain</p> <p>Compute in each subsample ("High School", "Undergraduate", "Graduate") the Pearson correlations between:</p> <p>ENTRECOM total and K-DOCS total</p> <p>ENTRECOM total and each K-DOCS domain</p> <p>Compute in the total sample the Spearman correlations between:</p> <p>Age and ENTRECOM total</p> <p>Age and K-DOCS total</p> <p>Age and each dimension of K-DOCS</p>

Inferential analysis	<p>Test for differences in Gender (IV) and the DVs (T Test* if 2 categories; one way ANOVA* if 3 categories):</p> <p>ENTRECOM total</p> <p>K-DOCS total</p> <p>Each K-DOCS domain</p> <p>Test for differences in Education Level (IV) and the DVs (T Test* if 2 categories; one-way ANOVA* if 3 categories):</p> <p>ENTRECOM total</p> <p>K-DOCS total</p> <p>Each K-DOCS domain</p> <p>Test for differences in Faculty at University (IV) and the DVs (one-way ANOVA* if 3 or more categories):</p> <p>ENTRECOM total</p> <p>K-DOCS total</p> <p>Each K-DOCS domain</p> <p>Test for differences in High School Type (IV) and the DVs (one-way ANOVA* if 3 or more categories):</p> <p>ENTRECOM total</p> <p>K-DOCS total</p> <p>Each K-DOCS domain</p>
Other analysis	<p>if necessary, those will be set by a team discussion, considering the NA aims.</p>

\* The assumptions of the test should be verified previously, including the number of participants (N).

#### ***1.4. Ethics permission from Sakarya University***

An ethics committee application was made to The Ethics Board of Sakarya University on April 20, 2021, with the petition of Prof. Dr. Osman Titrek, the coordinator of the Beyond the Limits: Developing Entrepreneurship via Creativity in School project. The ethics board of the rectorate of Sakarya University approved the implementation of this need analysis study with decision number 65 at its meeting number 34, on May 05, 2021. The approval number of the relevant ethics committee is E-6192333333-050.99-29304, so the implementation of this international study was approved and started on May 07, 2021. The ethic board application and decision are given in the Appendix 2: Sakarya University Ethics Board decision application approval cover letter and Appendix 3: Decision of Sakarya University Ethic Board.

## 2. Analysis of countries' results

### 2.1. Analysis of Italian results (N=524)

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#### 2.1.1. Scales reliability analysis K-DOCS and ENTRECOM

Italian results returned the reliability of the fifty K-DOCS items of .94 (Cronbach's Alpha) which is considered excellent<sup>1</sup>. Regarding its five dimensions, reliability values are reported in Table 5, which are all considered good or excellent.

*Table 5: Cronbach's Alpha K-DOCS Dimensions*

K-DOCS DIMENSIONS	ITALIAN VALUES
1 – Everyday	.80 (items 1-11)
2 – Scholarly	.86 (items 12-22)
3 – Performance	.89 (items 23-32)
4 – Mechanical/Scientific	.90 (items 33-41)
5 – Artistic	.86 (items 42-50)

Concerning ENTRECOM, the global Cronbach's Alpha of Italian participants was .86, which is a good and reliable indicator.

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<sup>1</sup> Hill and Hill (2006) points to the following reliability levels: <.60 unacceptable; .60-.69 weak; .70-.79 reasonable; .80-.89 good; >.90 excellent. Using distinct terms, Cohen, Manion & Morrison (2018) presents the same five levels as follows: >.90, very highly reliable; .80–.90, highly reliable; .70–.79, reliable; .60–.69, minimally reliable; <.60, unacceptable reliability.

Regarding age, the Italian group starts from 18 and goes until 22 and older, as shown in Table 6.

*Table 6: Age Groups: Italian descriptive statistics*

Age Group	Frequency	Percent
18 age	2	0.4
19 age	131	25.0
20 age	90	17.2
21 age	25	4.8
22 age and older	276	52.7

Considering the educational level, the categories frequency distributions were 16 (3.1%) for High School; 324 (61.8%) for undergraduate level; and 184 (35.1%) for graduate.

Referring to K-DOCS, Table 7 shows the descriptive results for the Italian participants in the survey. The higher mean refers to the “Self-Everyday Dimension” of self-perceived creativity (3.74) and the lower to “Mechanical-Scientific” (2.89), while all scores, of the given sample, are above the midpoint of the response scale of 2.5.

*Table 7: K-DOCS Italian Descriptive Results*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Stat.	Std. Error
KDOCS_TOT	524	1.00	4.90	3.2137	.50677	.207	.107	1.325	.213
SELF_EVERYDAY	524	1.00	5.00	3.7403	.49739	-.631	.107	2.971	.213
SCHOLARLY	524	1.00	5.00	3.3477	.57485	-.119	.107	.917	.213
PERFORMANCE	524	1.00	5.00	2.8929	.84340	.118	.107	-.416	.213
MECH-SCIENT	524	1.00	5.00	2.5017	.90803	.424	.107	-.386	.213
ARTISTIC	524	1.00	5.00	3.4750	.75763	-.277	.107	-.201	.213

Referring to ENTRECOM, Italian values are presented in Table 8 underlining a mean of 3.8, also above the midpoint of the response scale of 2.5 and even closer to the top value of 5.

*Table 8: ENTRECOM Italian descriptive statistics*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Statistic	Std. Error
ENTRECOM_TOT	524	1.00	5.00	3.7877	.46513	-1.052	.107	6.523	.213

### 2.1.3. Inferential analysis

#### 2.1.3.1. Age, entrepreneurship and creativity

Age could be considered a very interesting variable for understanding entrepreneurship and creativity competencies. In this regard, applying the non-parametric Spearman’s rho test,

Table 9 shows negative and significant correlations between age and K-DOCS mechanical and scientific totals and K-Doc artistic total. Correlation with age and ENTRECOM score doesn't report any significant results.

*Table 9: Age & K-DOCS Correlations – Italian overall results*

			ENTRECO	KDOCS	SELF_EVE	SCHOLAR	PERFOR	MECH-		
		Age	M_TOT	_TOT	RYDAY	LY	MANCE	SCIENT	ARTISTIC	
Spearman	Age	Corrl.Coeff.	1.000	-.041	-.067	.077	.060	-.050	-.138**	-.107**
		Sig.	.	.347	.125	.080	.171	.252	.002	.015
		N	524	524	524	524	524	524	524	524

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

### 2.1.3.2. Gender, entrepreneurship and creativity

Gender has also been considered an important variable to study entrepreneurship and creativity. Independent t-Test revealed gender significant differences regarding two K-DOCS creativity dimensions (Table 10), namely Mechanical-Scientific ( $t=-2.995$ ,  $p=.004$ ), favouring men (mean: 2,84; women: 2.47) and Artistic ( $t=4.125$ ,  $p<.001$ ), regarding which women present a higher mean (3.51 against 3.00). These results deserve consideration and broad study to understand the meaning behind such gender differences. As to ENTRECOMP scale, the statistics don't show any significant differences.

*Table 10: T-test for K-DOCS Gender Differences – Italian overall results*

		Levene's Test for Equality of				t-test for Equality of Means				
		Variances								
Dimensions		F	Sig.	t	df	Sig. (2-tailed)	Mean Differe	Std. Error Differe	95% Confidence Interval of the Difference	
									Lower	Upper
ENTRECOM_TOT	Eq.var.ass.	,801	,371	,685	521	,493	,05314	,07754	-,09919	,20546
KDOCS_TOT	Eq.var.ass.	3,461	,063	,259	521	,795	,02191	,08451	-,14411	,18793
SELF_EVERYDAY	Eq.var.ass.	,205	,651	1,427	521	,154	,11811	,08275	-,04444	,28067
SCHOLARLY	Eq.var.ass.	3,662	,056	-1,677	521	,094	-,16029	,09559	-,34809	,02751
PERFORMANCE	Eq.var.ass.	1,429	,232	,170	521	,865	,02395	,14053	-,25212	,30003
MECH-SCIENT	Eq.var~ass			-2,995	48,606	,004	-,36617	,12227	-,61192	-,12042
ARTISTIC	Eq.var.ass.	5,527	,019	4,125	521	<,001	,51286	,12433	,26860	,75711
	Eq.var~ass			5,238	49,457	<,001	,51286	,09791	,31614	,70958

Eq.var.ass.: Equal variances assumed  
 Eq.var~ass: Equal variances not assumed

2.1.3.3. Correlations between entrepreneurship and creativity

2.1.3.3.1. Correlations for the overall sample (N=524)

Concerning the global score correlation between entrepreneurship (ENTRECOM) and creativity (K-DOCS) competencies of young people, from High School to Faculty, the “r of Pearson” test indicated a value of  $r=.508$  ( $p< .001$ ), meaning a positive medium strength correlation with strong significance.

Regarding its dimensions’ results, displayed in Table 11, it stands out that all correlations are significant and positive. The correlations range from small (.267, .278, .304 respectively for Mechanical/Scientific, Performance, and Artistic creativity) to high (.510 for Scholarly Achievement and .556 for Everyday creativity). These results underline that for the Italian sample, entrepreneurship is especially connected to Scholarly Achievement and Everyday creativity.

Table 11: ENTRECOM\*K-DOCS Correlations –Italian overall and dimensional results

Dimensions		ENTRECO M_TOT	SELF_EVERYD AY	SCHOLARLY	PERFORMA NCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,556**	,510**	,278**	,267**	,304**
	Sig.		<,001	<,001	<,001	<,001	<,001
	N	524	524	524	524	524	524
SELF_EVERYDAY	Pearson r	,556**	1	,532**	,279**	,208**	,313**
	Sig.	<,001		<,001	<,001	<,001	<,001
	N	524	524	524	524	524	524
SCHOLARLY	Pearson r	,510**	,532**	1	,440**	,395**	,384**
	Sig.	<,001	<,001		<,001	<,001	<,001
	N	524	524	524	524	524	524
PERFORMANCE	Pearson r	,278**	,279**	,440**	1	,474**	,451**
	Sig.	<,001	<,001	<,001		<,001	<,001
	N	524	524	524	524	524	524
MECH-SCIENT	Pearson r	,267**	,208**	,395**	,474**	1	,405**
	Sig.	<,001	<,001	<,001	<,001		<,001
	N	524	524	524	524	524	524
ARTISTIC	Pearson r	,304**	,313**	,384**	,451**	,405**	1
	Sig.	<,001	<,001	<,001	<,001	<,001	
	N	524	524	524	524	524	524

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

2.1.3.3.2. Correlations for the high school sample (N=16)

The participants with High School educational level are only 16, so we were cautious about interpreting the data. The correlation, based on the overall data, between ENTRECOM and K-DOC is positive and high (.508,  $p < .001$ ), as well as very significant. Instead, we have found positive significant correlations between ENTRECOM and K-DOCS dimensions only for Self-Everyday and Scholarly dimensions (Table 12), .562 and .656 respectively.

*Table 12: ENTRECOM\*K-DOCS Correlations – Italian High School participants*

Dimensions		ENTRECOM	SELF_EVER	PERFORMAN		MECH-	ARTISTIC
		_TOT	YDAY	SCHOLARLY	CE	SCIENT	
ENTRECOM_TOT	Pearson r	1	,562*	,656**	,303	,347	,357
	Sig.		,023	,006	,254	,187	,174
	N	16	16	16	16	16	16
SELF_EVERYDAY	Pearson r	,562*	1	,536*	,388	,283	,503*
	Sig.	,023		,032	,138	,289	,047
	N	16	16	16	16	16	16
SCHOLARLY	Pearson r	,656**	,536*	1	,716**	,594*	,635**
	Sig.	,006	,032		,002	,015	,008
	N	16	16	16	16	16	16
PERFORMANCE	Pearson r	,303	,388	,716**	1	,753**	,390
	Sig.	,254	,138	,002		<,001	,136
	N	16	16	16	16	16	16
MECH-SCIENT	Pearson r	,347	,283	,594*	,753**	1	,229
	Sig.	,187	,289	,015	<,001		,394
	N	16	16	16	16	16	16
ARTISTIC	Pearson r	,357	,503*	,635**	,390	,229	1
	Sig.	,174	,047	,008	,136	,394	
	N	16	16	16	16	16	16

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

\*Correlation is significant at the 0.05 level (2-tailed).

2.1.3.3.3. Correlations for the undergraduate sample (N=324)

Regarding undergraduate educational level, results show a positive overall moderate (.532) and very significant correlation, between ENTRECOM and K-DOCS. Further, very significant positive correlations appear also between ENTRECOM and K-DOCS dimensions, although lower (.268, .321, .324) for Mechanical/Scientific dimensions of creativity, artistic creativity and Performance creativity, respectively) and of high strength (.490 and .609 for Scholarly and Everyday dimensions of creativity, respectively), as reported in Table 13.



*Table 13: ETRECOM\*K-DOCS Correlations – Italian Undergraduate participants*

Dimensions		ENTRECOM_	SELF_EVER		PERFORMAN	MECH-	ARTISTIC
		TOT	YDAY	SCHOLARLY	CE	SCIENT	
ENTRECOM_TOT	Pearson r	1	,609**	,490**	,324**	,268**	,321**
	Sig.		<,001	<,001	<,001	<,001	<,001
	N	324	324	324	324	324	324
SELF_EVERYDAY	Pearson r	,609**	1	,500**	,260**	,183**	,319**
	Sig.	<,001		<,001	<,001	<,001	<,001
	N	324	324	324	324	324	324
SCHOLARLY	Pearson r	,490**	,500**	1	,390**	,403**	,344**
	Sig.	<,001	<,001		<,001	<,001	<,001
	N	324	324	324	324	324	324
PERFORMANCE	Pearson r	,324**	,260**	,390**	1	,528**	,436**
	Sig.	<,001	<,001	<,001		<,001	<,001
	N	324	324	324	324	324	324
MECH-SCIENT	Pearson r	,268**	,183**	,403**	,528**	1	,395**
	Sig.	<,001	<,001	<,001	<,001		<,001
	N	324	324	324	324	324	324
ARTISTIC	Pearson r	,321**	,319**	,344**	,436**	,395**	1
	Sig.	<,001	<,001	<,001	<,001	<,001	
	N	324	324	324	324	324	324

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

#### 2.1.3.3.4. Correlations for the graduate sample (N=184)

For the graduate educational level of the Italian Participants, we have also found a positive overall, high (.496) and very significant correlation, between ENTRECOM and K-DOCS. In the same line, we have also found very significant correlations between ENTRECOM and K-DOCS dimensions (Table 14), namely of small strength .241, .286 (for Performance and Mechanical/Scientific dimensions of creativity, respectively); as well as of medium strength (.318 for Artistic dimension of creativity); and of high strength .501 and .521 (for Self-Everyday and Scholarly dimensions of creativity, respectively).

*Table 14: ETRECOM\*K-DOCS Correlations – Italian Graduate participants*

Dimensions		ENTRECOM_	SELF_EVER		PERFORMA	MECH-	ARTISTIC
		TOT	YDAY	SCHOLARLY	NCE	SCIENT	
ENTRECOM_TOT	Pearson r	1	,501**	,521**	,241**	,286**	,318**
	Sig.		<,001	<,001	<,001	<,001	<,001
	N	184	184	184	184	184	184

SELF_EVERYDAY	Pearson r	,501**	1	,557**	,313**	,265**	,332**
	Sig.	<,001		<,001	<,001	<,001	<,001
	N	184	184	184	184	184	184
SCHOLARLY	Pearson r	,521**	,557**	1	,504**	,403**	,451**
	Sig.	<,001	<,001		<,001	<,001	<,001
	N	184	184	184	184	184	184
PERFORMANCE	Pearson r	,241**	,313**	,504**	1	,374**	,472**
	Sig.	<,001	<,001	<,001		<,001	<,001
	N	184	184	184	184	184	184
MECH-SCIENT	Pearson r	,286**	,265**	,403**	,374**	1	,417**
	Sig.	<,001	<,001	<,001	<,001		<,001
	N	184	184	184	184	184	184
ARTISTIC	Pearson r	,318**	,332**	,451**	,472**	,417**	1
	Sig.	<,001	<,001	<,001	<,001	<,001	
	N	184	184	184	184	184	184

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

#### 2.1.3.4. Variations in entrepreneurship and creativity as a function of school level

Table 15 presents the main descriptive statistics for ENTRECOM and K-DOCS analysed as a function of the three educational levels considered.

*Table 15: Descriptive statistics of ENTRECOM\*K-DOCS as a function of educational level*

Dimensions		N	Mean	Std. Dev.
ENTRECOM_TOT	High School	16	3,8917	,32192
	Undergraduate	324	3,7568	,40648
	Graduate	184	3,8330	,55990
	Total	524	3,7877	,46513
KDOCS_TOT	High School	16	3,1250	,54619
	Undergraduate	324	3,2265	,46929
	Graduate	184	3,1990	,56532
	Total	524	3,2137	,50677
SELF_EVERYDAY	High School	16	3,6591	,51479
	Undergraduate	324	3,6970	,44748
	Graduate	184	3,8236	,56659
	Total	524	3,7403	,49739
SCHOLARLY	High School	16	3,2898	,47205
	Undergraduate	324	3,3092	,51091
	Graduate	184	3,4205	,67614
	Total	524	3,3477	,57485
PERFORMANCE	High School	16	2,7750	,90517
	Undergraduate	324	2,9244	,81015
	Graduate	184	2,8478	,89571
	Total	524	2,8929	,84340

MECH-SCIENT	High School	16	2,4583	,84022
	Undergraduate	324	2,5634	,86676
	Graduate	184	2,3967	,97700
	Total	524	2,5017	,90803
ARTISTIC	High School	16	3,3264	,85632
	Undergraduate	324	3,5490	,70376
	Graduate	184	3,3575	,82502
	Total	524	3,4750	,75763

To test for differences in entrepreneurship and creativity (including its five dimensions) at all educational levels, oneway ANOVAs were computed. Performing the inspection of ANOVA's assumptions, no problem was detected in the analysis concerning homoscedasticity (Levene tests -  $p > .05$ ). Table 16 shows the results obtained, pointing out there aren't significant differences in entrepreneurship.

*Table 16: ANOVA statistics for testing differences in ENTRECOM & K-DOCS as a function of educational levels*

Dimensions		Sum of Squares	df	Mean Square	F	p
ENTRECOM_TOT	Bet. Groups	,860	2	,430	1,994	,137
	With. Groups	112,292	521	,216		
	Total	113,151	523			
KDOCS_TOT	Bet. Groups	,218	2	,109	,424	,654
	With. Groups	134,095	521	,257		
	Total	134,314	523			
SELF_EVERYDAY	Bet. Groups	1,991	2	,996	4,071	,018
	With. Groups	127,400	521	,245		
	Total	129,391	523			
SCHOLARLY	Bet. Groups	1,508	2	,754	2,293	,102
	With. Groups	171,317	521	,329		
	Total	172,825	523			
PERFORMANCE	Bet. Groups	,917	2	,459	,644	,526
	With. Groups	371,107	521	,712		
	Total	372,024	523			
MECH-SCIENT	Bet. Groups	3,292	2	1,646	2,004	,136
	With. Groups	427,928	521	,821		
	Total	431,221	523			
ARTISTIC	Bet. Groups	4,670	2	2,335	4,117	,017
	With. Groups	295,532	521	,567		
	Total	300,203	523			

Regarding creativity, the total score didn't show significant differences. Nevertheless, significant differences were obtained in two creativity dimensions: "Self-Everyday" and "Artistic". Also, using post hoc statistics, the results show that the "Self-Everyday creativity" dimension of graduate students is significantly higher than that of undergraduate students (3.823, 3.697, respectively). On the contrary, the results between the same groups were obtained for the "Artistic creativity" dimension, undergraduate level students (mean: 3.549) are more creative than the graduate level (mean: 3.357).

The results presented for the educational level showed that entrepreneurship and creativity, in this needs analysis of the Italian context, need to support all target groups for the development of entrepreneurship competencies and creativity skills, through educational training, from high school to graduate students.

Concerning differences between areas of studies, it was not possible to perform the ANOVA test or other nonparametric tests because of the dispersion by areas and the very low Ns in the subsamples.

## 2.2. Analysis of Latvian results (N=179)

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### 2.2.1. Scales reliability analysis of K-DOCS and ENTRECOM

Latvian results returned reliability regarding the total samples (N: 179) and of the fifty K-DOCS items of .934 (Cronbach's Alpha), which is considered excellent. Regarding its five dimensions, reliability values are reported in Table 17, which range from reasonable to excellent.

*Table 17: Cronbach's Alpha of K-DOC Dimensions*

K-DOCS DIMENSIONS	LATVIAN VALUES
1 – Everyday	.744 (items 1-11)
2 – Scholarly	.839 (items 12-22)
3 – Performance	.912 (items 23-32)
4 – Mechanical/Scientific	.911 (items 33-41)
5 – Artistic	.837 (items 42-50)

Concerning ENTRECOM, the global Cronbach's Alpha of Latvian participants was .859, which is a good and reliable indicator.

### 2.2.2. Descriptive analysis

Of the 179 Latvian participants declared to be “female” 174 (97.2%) and “males” 5 (2.8%). Regarding age, the Latvian group starts from an age of 19 and goes until 22 and older, as shown in Table 18.

*Table 18: Age Groups: Italian descriptive statistics*

Age Group	Frequency	Percent
19 age	15	8,4
20 age	6	3,4
21 age	12	6,7
22 age and older	146	81,6

Considering the educational level, the categories frequency distributions were: of 12 (6.7%) for High School; 121 (67.6%) for undergraduate level; and 46 (25.7%) for graduate.

Referring to K-DOCS, Table 19 shows the descriptive results for the Latvian participants in the survey. The higher mean refers to the “Everyday Dimension” of self-perceived creativity

(3.68) and the lower to “MECH-SCIENT” (3.11), while all scores, of the giving sample, being above the midpoint of the response scale of 2.5.

*Table 19: K-DOCS Latvian Descriptive Results*

Dimesnions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Stat.	Std. Error
KDOCS_TOT	179	1,90	4,74	3,4245	,50864	-,347	,182	-,430	,361
SELF_EVERYDAY	179	2,09	4,82	3,6775	,44850	-,265	,182	,369	,361
SCHOLARLY	179	1,55	5,00	3,3687	,56966	-,348	,182	1,182	,361
PERFORMANCE	179	1,00	4,90	3,4061	,90908	-,660	,182	-,408	,361
MECH-SCIENT	179	1,00	4,89	3,1117	,93813	-,250	,182	-,835	,361
ARTISTIC	179	1,33	5,00	3,5164	,67580	-,510	,182	,274	,361

Referring to ENTRECOM, Latvian values are presented in Table 20 underlining a mean of 3.7, also above the midpoint of the response scale of 2.5.

*Table 20: ENTRECOM Latvian descriptive statistics*

Dimension	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Statistic	Std. Error
ENTRECOM_TOT	179	1,27	5,00	3,6991	,41749	-,188	,182	6,469	,361

### 2.2.3. Inferential analysis

#### 2.2.3.1. Age, entrepreneurship and creativity

Age could be considered a very interesting variable for understanding entrepreneurship and creativity competencies. The correlation between age and ENTRECOM scores was not significant, nor was the correlation between age and Creativity, considering the global results as well as the K-DOCS dimensions (Table 21).

*Table 21: Age & K-DOCS & ENTRECOM Correlations – Latvian overall results*

Dimensions		Age	SELF_E							
			ENTREC OM_TOT	VERYD AY	SCHOLA RLY	PERFOR MANCE	MECH- SCIENT	ARTISTI C	KDOCS_ TOT	
Spearman	Age	Corrl.Coeff.	1,000	-,047	,132	-,029	-,069	-,031	-,049	-,029
		Sig.	.	,535	,079	,702	,357	,682	,515	,701
		N	179	179	179	179	179	179	179	179

#### 2.2.3.2. Gender, entrepreneurship and creativity

Gender has also been commonly considered an important variable to study entrepreneurship and creativity. Between gender and K-DOCS (Table 22), Independent T-Test for the K-DOCS Artistic dimension showed significant differences: females’ mean (3.79) (t=2,048,

p=.043) higher than the males' mean (3.42). These results deserve consideration and broad study to understand the meaning behind the such difference. About the ENTRECOMP scale, the statistics don't return significant differences.

*Table 22: T-test for K-DOCS Gender Differences – Latvian overall results*

Dimensions	Levene's Test for Equality of Variances				t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
ENTRECOM_TOT	Eq.var.ass		,727	58,783	,470	,08124	,11172	-,14233	,30482	
KDOCS_TOT	Eq.var.ass.	,146	,703	,878	90	,382	,11057	,12590	-,13955	,36068
SELF Everyday	Eq.var.ass.	2,384	,126	1,425	90	,158	,17132	,12019	-,06747	,41011
SCHOLARLY	Eq.var.ass.	3,403	,068	,934	90	,353	,11986	,12830	-,13504	,37476
PERFORMANCE	Eq.var.ass.	,332	,566	1,076	90	,285	,23346	,21698	-,19760	,66453
MECH-SCIENT	Eq.var.ass.	6,230	,014	-1,564	90	,121	-,37357	,23888	-,84816	,10101
	Eq.var.ass			-1,647	88,455	,103	-,37357	,22679	-,82424	,07709
ARTISTIC	Eq.var.ass.	,683	,411	2,048	90	,043	,37254	,18190	,01117	,73390

### 2.2.3.3. Correlations between entrepreneurship and creativity

#### 2.2.3.3.1. Correlations for the overall sample (N=179)

In line with our research some considerations about the entrepreneurship and creativity competencies of young people, from High School to Faculty, were analysed. The Pearson correlation between K-DOCS and ENTRECOM global scores was  $r=.214$  ( $p=.004$ ), meaning a positive moderate correlation.

The Pearson test correlations indicate the following results displayed in Table 23 for the global scores and all the dimensions. The correlations between ENTRECOMP and K-DOCS dimensions, which are the most noteworthy, regard Scholarly Achievement ( $r=.240$ ,  $p=.001$ ), and Everyday creativity ( $r=.379$ ,  $p<.001$ ). All the other correlations were not significant.

*Table 23: ENTRECOM & K-DOCS Correlations –Latvian overall results*

Dimensions	ENTRECOM_TOT	SELF Everyday	SCHOLARLY	PERFORMANCE	MECH-SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,379**	,240**	,048	,130
	Sig.		,000	,001	,520	,082
	N	179	179	179	179	179

SELF_EVERYDAY	Pearson r	,379**	1	,546**	,217**	,247**	,189*
	Sig.	,000		,000	,004	,001	,011
	N	179	179	179	179	179	179
SCHOLARLY	Pearson r	,240**	,546**	1	,378**	,385**	,286**
	Sig.	,001	,000		,000	,000	,000
	N	179	179	179	179	179	179
PERFORMANCE	Pearson r	,048	,217**	,378**	1	,587**	,542**
	Sig.	,520	,004	,000		,000	,000
	N	179	179	179	179	179	179
MECH-SCIENT	Pearson r	,130	,247**	,385**	,587**	1	,503**
	Sig.	,082	,001	,000	,000		,000
	N	179	179	179	179	179	179
ARTISTIC	Pearson r	,086	,189*	,286**	,542**	,503**	1
	Sig.	,254	,011	,000	,000	,000	
	N	179	179	179	179	179	179

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

\*Correlation is significant at the 0.05 level (2-tailed).

#### 2.2.3.3.2. Correlations for the high school sample (N=12)

Regarding K-DOCS dimensions' results, displayed in Table 24, it stands out that all correlations are positive, although only Scholarly (.780) and Performance (.671) are significant. However, we must be cautious in interpreting these results because of the very small sample size (N=12). So, for the same reason, the other correlations cannot be interpreted.

Table 24: ETRECOM & K-DOCS Correlations – Latvian High School participants

Dimensions		ENTRECOM _TOT	SELF_EVE RYDAY	SCHOLARL Y	PERFORMA NCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,474	,780**	,671*	,111	,171
	Sig.		,119	,003	,017	,731	,595
	N	12	12	12	12	12	12
SELF_EVERYDAY	Pearson r	,474	1	,612*	,852**	,787**	,837**
	Sig.	,119		,034	,000	,002	,001
	N	12	12	12	12	12	12
SCHOLARLY	Pearson r	,780**	,612*	1	,648*	,238	,384
	Sig.	,003	,034		,023	,457	,218
	N	12	12	12	12	12	12
PERFORMANCE	Pearson r	,671*	,852**	,648*	1	,493	,593*
	Sig.	,017	,000	,023		,103	,042
	N	12	12	12	12	12	12



MECH-SCIENT	Pearson r	,111	,787**	,238	,493	1	,601*
	Sig.	,731	,002	,457	,103		,039
	N	12	12	12	12	12	12
ARTISTIC	Pearson r	,390	,828**	,383	,714**	,648*	,549
	Sig.	,211	,001	,219	,009	,023	
	N	12	12	12	12	12	12

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

\* . Correlation is significant at the 0.05 level (2-tailed).

#### 2.2.3.3.3. Correlations for the undergraduate sample (N=121)

Regarding undergraduate educational level, results between ENTRECOM and K-DOCS show positive correlations, being Self-Everyday (.388) and Scholarly (.404) dimensions moderate and significant, as reported in Table 25. The correlations concerning the other dimensions are very low and not significant.

*Table 25: ETRECOM & K-DOCS Correlations – Latvian Undergraduate participants*

Dimensions		ENTRECOM	SELF_EVE	SCHOLARL	PERFORMA	MECH-	ARTISTIC
		_TOT	RYDAY	Y	NCE	SCIENT	
ENTRECOM_TOT	Pearson r	1	,388**	,404**	,172	,126	,165
	Sig.		,000	,000	,059	,167	,070
	N	121	121	121	121	121	121
SELF_EVERYDAY	Pearson r	,388**	1	,571**	,217*	,188*	,137
	Sig.	,000		,000	,017	,039	,134
	N	121	121	121	121	121	121
SCHOLARLY	Pearson r	,404**	,571**	1	,323**	,320**	,200*
	Sig.	,000	,000		,000	,000	,028
	N	121	121	121	121	121	121
PERFORMANCE	Pearson r	,172	,217*	,323**	1	,595**	,590**
	Sig.	,059	,017	,000		,000	,000
	N	121	121	121	121	121	121
MECH-SCIENT	Pearson r	,126	,188*	,320**	,595**	1	,573**
	Sig.	,167	,039	,000	,000		,000
	N	121	121	121	121	121	121
ARTISTIC	Pearson r	,165	,137	,200*	,590**	,573**	1
	Sig.	,070	,134	,028	,000	,000	
	N	121	121	121	121	121	121

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

\*Correlation is significant at the 0.05 level (2-tailed).

#### 2.2.3.3.4. Correlations for the graduate sample (N=46)

Concerning graduate educational level, correlation results between ENTRECOM and K-DOCS show that only Self-Everyday is significant (.324), as presented in Table 26. The correlations concerning the other dimensions are very low and not significant.

*Table 26: ETRECOM & K-DOCS Correlations – Latvian Graduate participants*

Dimensions		ENTRECOM _TOT	SELF_EVE RYDAY	SCHOLARL Y	PERFORMA NCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,324*	-,122	-,143	,135	-,097
	Sig. (2-tailed)		,028	,418	,343	,369	,521
	N	46	46	46	46	46	46
SELF EVERYDAY	Pearson r	,324*	1	,414**	,211	,356*	,336*
	Sig. (2-tailed)	,028		,004	,160	,015	,022
	N	46	46	46	46	46	46
SCHOLARLY	Pearson r	-,122	,414**	1	,452**	,439**	,381**
	Sig. (2-tailed)	,418	,004		,002	,002	,009
	N	46	46	46	46	46	46
PERFORMANCE	Pearson r	-,143	,211	,452**	1	,542**	,434**
	Sig. (2-tailed)	,343	,160	,002		,000	,003
	N	46	46	46	46	46	46
MECH-SCIENT	Pearson r	,135	,356*	,439**	,542**	1	,344*
	Sig. (2-tailed)	,369	,015	,002	,000		,019
	N	46	46	46	46	46	46
ARTISTIC	Pearson r	-,097	,336*	,381**	,434**	,344*	1
	Sig. (2-tailed)	,521	,022	,009	,003	,019	
	N	46	46	46	46	46	46

#### 2.3.3.4. Variations in entrepreneurship and creativity as a function of school level

Table 27 presents the main descriptive statistics for ENTRECOM and K-DOCS analysed as a function of the three educational levels considered.

*Table 27: Descriptive statistics of ENTRECOM\*K-DOCS as a function of educational level*

Dimensions		N	Mean	Std. Dev.
ENTRECOM_TOT	High School	12	3,6722	,41629
	Undergraduate	121	3,6992	,36648
	Graduate	46	3,7058	,53731
	Total	179	3,6991	,41749
KDOCS_TOT	High School	12	3,2733	,58895
	Undergraduate	121	3,4830	,48650
	Graduate	46	3,3100	,52795
	Total	179	3,4245	,50864
SELF_EVERYDAY	High School	12	3,4318	,46375
	Undergraduate	121	3,7032	,47103
	Graduate	46	3,6739	,36544
	Total	179	3,6775	,44850
SCHOLARLY	High School	12	3,1364	,65613
	Undergraduate	121	3,4080	,55225
	Graduate	46	3,3261	,58715
	Total	179	3,3687	,56966
PERFORMANCE	High School	12	3,3000	,82462
	Undergraduate	121	3,5289	,85004
	Graduate	46	3,1109	1,02138
	Total	179	3,4061	,90908
MECH-SCIENT	High School	12	2,8611	1,09905
	Undergraduate	121	3,2057	,90126
	Graduate	46	2,9300	,97242
	Total	179	3,1117	,93813
ARTISTIC	High School	12	3,6296	,72371
	Undergraduate	121	3,5317	,65675
	Graduate	46	3,4469	,72065
	Total	179	3,5164	,67580

To test for differences in entrepreneurship and creativity (including its five dimensions) at all educational levels, Oneway ANOVAs were computed. Performing the inspection of ANOVA's assumptions, no problem was detected in the analysis concerning homoscedasticity (Levene tests -  $p > .05$ ), except for the K-DOCS Performance dimension. Table 28 shows the results obtained.

*Table 28: ANOVA statistics for testing differences in ENTRECOM & K-DOCS as a function of educational levels*

Dimensions		Sum of Squares	df	Mean Square	F	p
ENTRECOM_TOT	Bet. Groups	,011	2	,005	,030	,970
	With. Groups	31,015	176	,176		
	Total	31,025	178			
KDOCS_TOT	Bet. Groups	1,291	2	,646	2,538	,082
	With. Groups	44,761	176	,254		
	Total	46,052	178			
SELF_EVERYDAY	Bet. Groups	,805	2	,403	2,024	,135
	With. Groups	34,999	176	,199		
	Total	35,805	178			
SCHOLARLY	Bet. Groups	,918	2	,459	1,421	,244
	With. Groups	56,846	176	,323		
	Total	57,764	178			
PERFORMANCE	Bet. Groups	5,970	2	2,985	3,722	,026
	With. Groups	141,133	176	,802		
	Total	147,103	178			
MECH-SCIENT	Bet. Groups	3,342	2	1,671	1,918	,150
	With. Groups	153,312	176	,871		
	Total	156,654	178			
ARTISTIC	Bet. Groups	,405	2	,202	,440	,645
	With. Groups	80,890	176	,460		
	Total	81,294	178			

The comparisons between the three educational levels in Table 28 show that there aren't significant differences in entrepreneurship

Regarding creativity, the total score didn't show significant differences. However, concerning its dimensions, only "Performance" is significant, meaning that undergraduate students perform better (mean=3,53) than graduates (mean=3,11).

The results presented for the educational level showed that entrepreneurship and creativity, in this needs analysis for the Latvian context, need to be supported in all target groups for the development of entrepreneurship competences and creativity skills, through educational training, especially turning attention to graduate students. Since the sample size of high-school students is very low we cannot take further inferences about the results.

Concerning differences between areas of studies, it was not possible to perform the ANOVA test or other nonparametric tests because of the dispersion by areas and the very low Ns in the subsamples.

### 2.3. Analysis of Portuguese results (N=865)

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#### 2.3.1. Scales reliability analysis of K-DOCS

Portuguese results returned reliability regarding the total samples (N: 865) and of the fifty K-DOCS items of .936 (Cronbach's Alpha) which is considered excellent. As to K-DOCS dimensions' reliability, values varied as follows in Table 29, which are all considered acceptable, while fairly high.

*Table 29: Cronbach's Alpha Values of Dimensions*

K-DOCS DIMENSIONS	PORTUGUESE VALUES
1 – Everyday	.798 (items 1-11)
2 – Scholarly	.870 (items 12-22)
3 – Performance	.9194(items 23-32)
4 – Mechanical/Scientific	.906(items 33-41)
5 – Artistic	.873(items 42-50)

Concerning ENTRECOM, global Cronbach's Alpha of Portuguese results was .872, a good and reliable indicator.

#### 2.3.2. Descriptive analysis

Of the 865 Portuguese respondents, 542 (62.7%) declared to be “female”, 308 (35.6%) “males” and 15 (1.7%) referred to themselves as being of “other” gender.

Regarding age we have found the following distribution (Table 30).

*Table 30: Age Groups: Portuguese descriptive statistics*

Age Group	Frequency	Percent
15 age and younger	60	6.9
16 age	71	8.2
17 age	85	9.8
18 age	226	26.1

19 age	88	10.2
20 age	44	5.1
21 age	29	3.4
22 age and older	262	30.3

The above values could be well understood by considering the answers to the question of “level of education”, to which 499 (57.7%) declared being at High School, which could include the first four age groups. 218 (25.2%) said to be at the undergraduation level and 148 (17.1%) in graduation courses.<sup>2</sup>

As to K-DOCS, Table 31 presents the descriptive results for the Portuguese participants in the survey. The higher mean refers to the “Everyday Dimension” of self-perceived creativity (3.76) and the lower to “MECH-SCIENT” (2.88), while being all scores, of the given population, above the midpoint of the response scale of 2.5.

*Table 31: K-DOCS Portuguese Descriptive Results*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Stat.	Std. Error
						KDOCS_TOT	865	1.52	5.00
SELF_EVERYDAY	865	1.73	5.00	3.7688	.50946	.014	.083	.069	.166
SCHOLARLY	865	1.36	5.00	3.5783	.60944	.020	.083	.041	.166
PERFORMANCE	865	1.00	5.00	2.9666	1.00868	-.038	.083	-.894	.166
MECH-SCIENT	865	1.00	5.00	2.8876	.96222	.082	.083	-.695	.166
ARTISTIC	865	1.00	5.00	3.3679	.84036	-.278	.083	-.241	.166

Concerning ENTRECOM, Portuguese results (Table 32) present a mean of 3.8, also above the midpoint of the response scale of 2.5 and even closer to the top value of 5.

*Table 32: ENTRECOM Portuguese descriptive statistics*

Dimension	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Statistic	Std. Error
ENTRECOM_TOT	865	2.00	5.00	3.8098	.48836	-.107	.083	.507	.166

<sup>2</sup> The apparent slight disparity in frequencies (with the respective percentages) between Age Groups and Education Levels can be explained by the facts that some undergraduate respondents are included in the eighteen-year-old group, as well as some of those who declare to be older are included in the level corresponding to High School, as is the case of those in Youth and Adult Education and Training.

### 2.3.3. Inferential analysis

#### 2.3.3.1. Age, entrepreneurship and creativity

Age could be considered a very interesting variable for understanding entrepreneurship and creativity competencies. In this regard (Table 33), applying non-parametric Spearman’s rho test, we found very low positive and negative correlations between age and K-DOCS total score, although concerning its dimensions some being significant and even very significant but still low. As to the correlation between age and ENTRECOM score, of self-reported competence, we found a very low positive correlation, although significant (this result is explained by the large sample, no substantive meaning can be inferred).

*Table 33: Age & K-DOCS Correlations – Portuguese overall results (N=865)*

Dimension		ENTREC		KDOCS		SELF_EV		SCHOLA		PERFOR		MECH-	
		Age	OM_TOT	_TOT	ERYDAY	RLY	MANCE	SCIENT	ARTISTIC				
Spearman	Age	Corrl.Coeff.	1.000	.079*	-.029	.074*	.155**	-.082*	-.106**	-.033			
		Sig.	.	.020	.394	.029	.000	.016	.002	.330			
		N	865	865	865	865	865	865	865	865			

\*Correlation is significant at the 0.05 level (2-tailed).

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

#### 2.3.3.2. Gender, entrepreneurship and creativity

Gender has also been commonly considered an important variable to study entrepreneurship and creativity. We sought to analyse differences between gender regarding K-DOCS (Table 34), but the Independent Samples Test returned no significant results, except for K-DOCS dimensions of Mechanical/Scientific creativity, where males’ mean (3.19) appears, with a very significant value, as superior to female (2.70) ( $t=-7.405$ ,  $p<.001$ ), and Artistic creativity, where, on the contrary, females’ mean (3.46) ( $t=4.704$ ,  $p<.001$ ) showed to be higher than the males’ result (3.18). An outcome that deserves reflection and broad study to understand the reasons behind such differences and their meanings. Now, regarding ENTRECOMP no significant differences could be found.



*Table 34: T-test for K-DOCS Gender Differences – Portuguese overall results*

Dimensions	Levene's Test for Equality of Variances			t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
ENTRECOM_TOT	Eq.var.ass.	1.893	.169	.858	848	.391	.02988	.03484	-.03849	.09826
KDOCS_TOT	Eq.var.ass.	.169	.681	-.835	848	.404	-	.03945	-.11037	.04448
SELF_EVERYDAY	Eq.var.ass.	.232	.630	.715	848	.475	.02592	.03623	-.04519	.09703
SCHOLARLY	Eq.var.ass.	3.051	.081	-.237	848	.813	-	.04364	-.09600	.07532
PERFORMANCE	Eq.var.ass.	2.120	.146	.174	848	.862	.01255	.07211	-.12899	.15409
MECH-SCIENT	Eq.var.ass.	.005	.941	-7.405	848	.000	-	.06677	-.62550	-.36338
ARTISTIC	Eq.var.ass.	7.192	.007	4.704	848	.000	.27844	.05920	.16226	.39463
	Eq.var~ass			4.540	573.04	.000	.27844	.06133	.15799	.39890

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### 2.3.3.3. Correlations between entrepreneurship and creativity

Taking into consideration that we are researching the entrepreneurship and creativity competencies of young people, from High School to Faculty, we envisaged it as convenient to look for the correlation between K-DOCS and ENTRECOM global scores. In this respect, the “r of Pearson” test has returned a value of .478 ( $p < .001$ ), meaning a positive medium strength correlation with strong significance.

#### 2.3.3.3.1. Correlations for the overall sample (N=865)

When we search for a correlation between K-DOCS dimensions, the Pearson test presented the following displayed in Table 35. Of most importance are the correlations between ENTRECOMP and K-DOCS dimensions, which, being all positive and very significant, ranged from small (.173, .267, .268 respectively for Mechanical/Scientific, Performance and Artistic creativity) to high (.531 for Scholarly Achievement and .605 for Everyday creativity). These results point to a worrisome low proficiency of some nuclear dimensions of creativity in association with entrepreneurship, showing the Portuguese sample that entrepreneurship is especially connected to Scholarly Achievement and Self-Everyday creativity.

*Table 35: ENTRECOM & K-DOCS Correlations – Portuguese overall results*

Dimensions		ENTRECOM _TOT	SELF_EVERY DAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM _TOT	Pearson r	1	.605**	.531**	.267**	.173**	.268**
	Sig.		.000	.000	.000	.000	.000
	N	865	865	865	865	865	865
SELF_EVERYDAY	Pearson r	.605**	1	.591**	.330**	.257**	.322**
	Sig.	.000		.000	.000	.000	.000
	N	865	865	865	865	865	865
SCHOLARLY	Pearson r	.531**	.591**	1	.388**	.224**	.393**
	Sig.	.000	.000		.000	.000	.000
	N	865	865	865	865	865	865
PERFORMANCE	Pearson r	.267**	.330**	.388**	1	.422**	.534**
	Sig.	.000	.000	.000		.000	.000
	N	865	865	865	865	865	865
MECH-SCIENT	Pearson r	.173**	.257**	.224**	.422**	1	.318**
	Sig.	.000	.000	.000	.000		.000
	N	865	865	865	865	865	865
ARTISTIC	Pearson r	.268**	.322**	.393**	.534**	.318**	1
	Sig.	.000	.000	.000	.000	.000	
	N	865	865	865	865	865	865

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

#### 2.3.3.3.2. Correlations for the high school sample (N=499)

Specifically, for those of High School education level, we have found positive very significant correlations between ENTRECOM and K-DOCS (Table 36), ranging from small (.207, .246, for Mechanical/Scientific and Artistic creativity respectively) to medium (.323 for Performance) and high (.554 and .621 for Scholarly and Everyday creativity respectively). While the correlation based on the overall data, for this education level, can be considered positive and high (.518), as well as very significant.

*Table 36: ENTRECOM\*K-DOCS Correlations – Portuguese High School participants*

Dimensions		ENTRECOM _TOT	SELF_ EVERYDAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	.621**	.554**	.323**	.207**	.246**
	Sig.		.000	.000	.000	.000	.000
	N	499	499	499	499	499	499
SELF_EVERYDAY	Pearson r	.621**	1	.588**	.384**	.265**	.288**
	Sig.	.000		.000	.000	.000	.000
	N	499	499	499	499	499	499

SCHOLARLY	Pearson r	.554**	.588**	1	.437**	.224**	.364**
	Sig.	.000	.000		.000	.000	.000
	N	499	499	499	499	499	499
PERFORMANCE	Pearson r	.323**	.384**	.437**	1	.408**	.522**
	Sig.	.000	.000	.000		.000	.000
	N	499	499	499	499	499	499
MECH-SCIENT	Pearson r	.207**	.265**	.224**	.408**	1	.251**
	Sig.	.000	.000	.000	.000		.000
	N	499	499	499	499	499	499
ARTISTIC	Pearson r	.246**	.288**	.364**	.522**	.251**	1
	Sig.	.000	.000	.000	.000	.000	
	N	499	499	499	499	499	499

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

#### 2.3.3.3.3. Correlations for the undergraduate sample (N=218)

As to those of undergraduate education level, we have also found a positive overall medium (.447) and a very significant correlation, between ENTRECOM and K-DOCS. Besides, we have found very significant positive correlations between ENTRECOM and K-DOCS dimensions, namely of small strength (.162, .228 for Mechanical/Scientific and Performance dimensions of creativity, respectively) and of high strength (.499 and .585 for Scholarly and Everyday dimensions of creativity, respectively), as shown in Table 37.

*Table 37: ETRECOM\*K-DOCS Correlations – Portuguese Undergraduate participants*

Dimensions		ENTRE COM_TOT	SELF_ EVERYDAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	.585**	.499**	.228**	.162*	.320**
	Sig. (2-tailed)		.000	.000	.001	.017	.000
	N	218	218	218	218	218	218
SELF_EVERYDAY	Pearson r	.585**	1	.581**	.335**	.291**	.373**
	Sig.	.000		.000	.000	.000	.000
	N	218	218	218	218	218	218
SCHOLARLY	Pearson r	.499**	.581**	1	.429**	.342**	.495**
	Sig.	.000	.000		.000	.000	.000
	N	218	218	218	218	218	218
PERFORMANCE	Pearson r	.228**	.335**	.429**	1	.380**	.556**
	Sig.	.001	.000	.000		.000	.000
	N	218	218	218	218	218	218
MECH-SCIENT	Pearson r	.162*	.291**	.342**	.380**	1	.372**
	Sig.	.017	.000	.000	.000		.000
	N	218	218	218	218	218	218

ARTISTIC	Pearson r	.320**	.373**	.495**	.556**	.372**	1
	Sig.	.000	.000	.000	.000	.000	
	N	218	218	218	218	218	218

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

\*Correlation is significant at the 0.05 level (2-tailed).

#### 2.3.3.3.4. Correlations for the graduate sample (N=148)

Concerning graduate education level, we have also found a positive overall medium (.397) and positive very significant correlations, between ENTRECOM and K-DOCS. In addition, we have found very significant correlations between ENTRECOM and K-DOCS dimensions (Table 38), namely of small strength (.137, .203 and .264 for Mechanical/Scientific, Performance and Artistic dimensions of creativity, respectively) and of medium strength (.433 for Scholarly dimension of creativity), as well as of high strength (.541) for Everyday dimension of creativity.

*Table 38: ETRECOM\*K-DOCS Correlations – Portuguese Graduate participants*

Dimensions		ENTRECOM _TOT	SELF_EVE RYDAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	.541**	.433**	.203*	.137	.264**
	Sig.		.000	.000	.013	.096	.001
	N	148	148	148	148	148	148
SELF_EVERYDAY	Pearson r	.541**	1	.562**	.222**	.247**	.363**
	Sig. (2-tailed)	.000		.000	.007	.002	.000
	N	148	148	148	148	148	148
SCHOLARLY	Pearson r	.433**	.562**	1	.290**	.150	.367**
	Sig.	.000	.000		.000	.068	.000
	N	148	148	148	148	148	148
PERFORMANCE	Pearson r	.203*	.222**	.290**	1	.492**	.545**
	Sig.	.013	.007	.000		.000	.000
	N	148	148	148	148	148	148
MECH-SCIENT	Pearson r	.137	.247**	.150	.492**	1	.421**
	Sig.	.096	.002	.068	.000		.000
	N	148	148	148	148	148	148
ARTISTIC	Pearson r	.264**	.363**	.367**	.545**	.421**	1
	Sig.	.001	.000	.000	.000	.000	
	N	148	148	148	148	148	148

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

\*Correlation is significant at the 0.05 level (2-tailed).

2.3.3.4. Variations in entrepreneurship and creativity as a function of school level

Table 39 presents the main descriptive statistics for ENTRECOM and K-DOCS analysed as a function of the three educational levels considered.

*Table 39: Descriptive statistics of ENTRECOM\*K-DOCS as a function of educational level*

Dimensions		N	Mean	Std. Dev.
ENTRECOM_TOT	High School	499	3.7833	.48055
	Undergraduate	218	3.7596	.46215
	Graduate	148	3.9730	.52082
	Total	865	3.8098	.48836
KDOCS_TOT	High School	499	3.3396	.53363
	Undergraduate	218	3.2870	.55692
	Graduate	148	3.3942	.59608
	Total	865	3.3357	.55107
SELF_EVERYDAY	High School	499	3.7302	.51059
	Undergraduate	218	3.7581	.49088
	Graduate	148	3.9146	.50989
	Total	865	3.7688	.50946
SCHOLARLY	High School	499	3.5212	.59804
	Undergraduate	218	3.5379	.57755
	Graduate	148	3.8305	.63363
	Total	865	3.5783	.60944
PERFORMANCE	High School	499	3.0216	.98518
	Undergraduate	218	2.9087	.96251
	Graduate	148	2.8662	1.13973
	Total	865	2.9666	1.00868
MECH-SCIENT	High School	499	2.9552	.90009
	Undergraduate	218	2.7956	.99676
	Graduate	148	2.7950	1.09264
	Total	865	2.8876	.96222
ARTISTIC	High School	499	3.3779	.81756
	Undergraduate	218	3.3160	.85605
	Graduate	148	3.4107	.89357
	Total	865	3.3679	.84036

To test for differences in entrepreneurship and creativity (including its five dimensions) at the high school, undergraduate and graduate educational levels, Oneway ANOVAs were

carried out. Performing the inspection of ANOVA's assumptions no problem was detected in the majority of the analysis concerning homoscedasticity (Levene tests -  $p > .05$ ). However, the Performance and MECH-SCIENT dimensions of the creativity instrument showed no homogeneity of variances. In these two cases, the non-parametric Independent-Samples Kruskal-Wallis Test was applied. Table 40 presents the results obtained.

*Table 40: ANOVA and Kruskal-Wallis statistics for testing differences in ENTRECOM\*K-DOCS as a function of educational levels*

Dimensions		Sum of Squares	df	Mean Square	F	p	$\chi^2$	p
ENTRECOM_TOT	Bet. Groups	4.840	2	2.420	10.4	.000		
	With. Groups	201.224	862	.233				
	Total	206.064	864					
KDOCS_TOT	Bet. Groups	1.032	2	.516	1.70	.183		
	With. Groups	261.345	862	.303				
	Total	262.376	864					
SELF EVERYDAY	Bet. Groups	3.916	2	1.958	7.66	.001		
	With. Groups	220.337	862	.256				
	Total	224.253	864					
SCHOLARLY	Bet. Groups	11.392	2	5.696	15.9	.000		
	With. Groups	309.515	862	.359				
	Total	320.907	864					
PERFORMANCE	Bet. Groups	3.734	2	1.867	1.84	.160	3.61	.165
	With. Groups	875.331	862	1.015				
	Total	879.064	864					
MECH-SCIENT	Bet. Groups	5.396	2	2.698	2.93	.054	5.24	.073
	With. Groups	794.554	862	.922				
	Total	799.949	864					
ARTISTIC	Bet. Groups	.907	2	.454	.642	.527		
	With. Groups	609.257	862	.707				
	Total	610.165	864					

The comparisons between the three educational levels in Table 16 show that there are significant differences in entrepreneurship (ENTRECOM:  $F=10.4$ ,  $p < .001$ ). Post-hoc tests revealed significant differences between High school and graduate levels as well as between undergraduate and graduate students. These results mean, as expected, that the higher the

educational level, the higher the perception of entrepreneurship competence since the highest scores were found for the graduate study cycle.

Regarding creativity, the total score didn't show significant differences (KDOCS:  $F=1.70$ ,  $p=.183$ ), but table 16 shows significant differences in two creativity dimensions: "Self-Everyday" and "Scholarly". In "Self-Everyday creativity" of high school, students differ significantly from graduate students (higher in this last group,  $p<.001$ ) and the same was verified between undergraduate and graduate students (higher in this last group  $p=.01$ ). The same results between the same groups were obtained for the "Scholarly creativity" dimension, being students of the higher educational level more creative than the others.

The results presented concerning educational level, entrepreneurship and creativity, in this needs analysis in Portugal, support the recommendation for having as target groups for the development of entrepreneurship competencies and creativity skills, through educational training, for high school and undergraduate students.

Concerning differences between areas of studies, it was not possible to perform the ANOVA test or other nonparametric tests because of the dispersion by areas and the very low Ns in the subsamples.

## 2.4. Analysis of the Romanian results (N=489)

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### 2.4.1. Scales reliability analysis of K-DOCS

Romanian results returned reliability regarding the total samples (N: 489) and of the fifty K-DOCS items of .95 (Cronbach's Alpha) which is considered excellent. As to K-DOCS dimensions' reliability, values varied as follows in Table 41, which are all considered reliable/strong.

*Table 41: Cronbach's Alpha Values of Dimensions*

K-DOCS DIMENSIONS	ROMANIAN VALUES
1 – Self/Everyday	.85 (items 1-11)
2 – Scholarly	.89 (items 12-22)
3 – Performance	.92 (items 23-32)
4 – Mechanical/Scientific	.91 (items 33-41)
5 – Artistic	.88 (items 42-50)

Concerning ENTRECOM, global Cronbach's Alpha of Romanian results was .90, a strong reliable indicator (the item-total correlations varied between .433 to .724), meaning that no item showed to be problematic, as in the pilot study.

### 2.4.2. Descriptive analysis

Of the 489 Romanian respondents, 366 (74.8%) declared to be “female”, 121 (24.7%) “males” and 2 (.4%) referred to themselves as being of “other” gender. Regarding age, we have found the following distribution (Table 42).

*Table 42: Age Groups: Romanian descriptive statistics*

Age Group	Frequency	Percent
15 age and younger	2	,4
16 age	2	,4
17 age	6	1,2
18 age	12	2,5
19 age	66	13,5
20 age	80	16,4
21 age	46	9,4
22 age and older	275	56,2



The above values could be well understood by considering the answers to the question of “level of education”, to which 73 (14.9%) declared being at High School, which could include partially the first four age groups; while 288 (58.9%) said to be at the undergraduate level and 128 (26.2%) in graduation courses.

As to K-DOCS, descriptive results show a global mean of 3.42. While for the dimensions we can see that the higher mean refers to “Scholarly” (3.68) of self-perceived creativity, and the lower to “MECH-SCIENT” (2.79), while being all scores, of the giving population, above the midpoint of the response scale of 2.5 (Table 43).

*Table 43: ENTRECOM & K-DOCS Romanian Descriptive Results*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Stat.	Std. Error
ENTRECOM_TOT	489	1,27	5,00	4,0130	,46114	-,557	,110	3,207	,220
KDOCS_TOT	489	1,82	5,00	3,4156	,58879	,373	,110	,065	,220
SELF_EVERYDAY	489	1,82	5,00	4,0266	,52529	-,170	,110	,240	,220
SCHOLARLY	489	1,45	5,00	3,6778	,64911	-,056	,110	,152	,220
PERFORMANCE	489	1,00	5,00	3,0121	,98715	,000	,110	-,711	,220
MECH-SCIENT	489	1,00	5,00	2,7855	1,00449	,145	,110	-,719	,220
KDOCS_ARTISTIC	489	1,00	5,00	3,4267	,84538	-,341	,110	-,267	,220

In regard to ENTRECOM, Romanian results (Table 44) present a mean of 4.1 also above the midpoint of the response scale of 2.5 and even closer to the top value of 5.

*Table 44: ENTRECOM Romanian descriptive statistics*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Statistic	Std. Error
ENTRECOM_TOT	489	1,27	5,00	4,0130	,46114	-,557	,110	3,207	,220

### 2.4.3. Inferential analysis

#### 2.4.3.1. Age, entrepreneurship and creativity

Age could be considered a very interesting variable for understanding entrepreneurship and creativity competencies. In this regard (Table 45), applying the non-parametric Spearman’s rho test, we found a near-zero correlation between age and K-DOCS total score. As to the correlation between age and ENTRECOM score, of self-reported competence, we found a very

low positive correlation (.157), although significant (this result is explained by the large sample, no substantive meaning can be inferred).

*Table 45: Age\*ENTRECOM-TOT\*K-DOCS Correlations – Romanian overall results*

Dimensions			Age	ENTREC OM_TOT	KDOCS _TOT	SELF_EV ERYDAY	SCHOLA RLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
Spe ar ma n	Age	Pearson r	1,000	,157**	,046	,036	,063	,012	,111*	-,041
		Sig.	.	,000	,311	,428	,161	,797	,014	,371
		N	489	489	489	489	489	489	489	489
rho	ENTREC	Pearson r	,157**	1,000	,417**	,548**	,497**	,232**	,238**	,227**
	OM_TO	Sig.	,000	.	,000	,000	,000	,000	,000	,000
	T	N	489	489	489	489	489	489	489	489
KDOCS_ TOT		Pearson r	,046	,417**	1,000	,584**	,721**	,800**	,697**	,783**
		Sig.	,311	,000	.	,000	,000	,000	,000	,000
		N	489	489	489	489	489	489	489	489
SELF_EV ERYDAY		Pearson r	,036	,548**	,584**	1,000	,553**	,340**	,252**	,295**
		Sig.	,428	,000	,000	.	,000	,000	,000	,000
		N	489	489	489	489	489	489	489	489
SCHOLA RLY		Pearson r	,063	,497**	,721**	,553**	1,000	,458**	,338**	,469**
		Sig.	,161	,000	,000	,000	.	,000	,000	,000
		N	489	489	489	489	489	489	489	489
PERFOR MANCE		Pearson r	,012	,232**	,800**	,340**	,458**	1,000	,422**	,575**
		Sig.	,797	,000	,000	,000	,000	.	,000	,000
		N	489	489	489	489	489	489	489	489
MECH- SCIENT		Pearson r	,111*	,238**	,697**	,252**	,338**	,422**	1,000	,501**
		Sig.	,014	,000	,000	,000	,000	,000	.	,000
		N	489	489	489	489	489	489	489	489
ARTISTIC		Pearson r	-,041	,227**	,783**	,295**	,469**	,575**	,501**	1,000
		Sig.	,371	,000	,000	,000	,000	,000	,000	.
		N	489	489	489	489	489	489	489	489

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

\*Correlation is significant at the 0.05 level (2-tailed).

#### 2.4.3.2. Gender, entrepreneurship and creativity

Gender has also been commonly considered an important variable to study entrepreneurship and creativity. We sought to analyse differences between gender regarding K-DOCS (Table 46), but the Independent Samples Test returned no significant results, except for K-DOCS dimensions of Mechanical/Scientific creativity, where males' mean (3.17) appears, with

a very significant value, as superior to female (2.66) ( $t=-5.004$ ,  $p<.001$ ). Now, about ENTRECOMP no significant differences could be found.

*Table 46: Gender Differences\*K-DOCS Correlations – Romanian overall results*

Dimensions	Levene's Test for Equality of Variances				t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean	Std. Error	95% Confidence Interval of the Difference		
						Difference	Difference	Lower	Upper	
ENTRECOM_TOT	Eq.var.ass.	,747	,388	-1,360	485	,175	- ,04794	,06520	-,15940	,02901
KDOCS_TOT	Eq.var.ass.	2,262	,133	-1,451	485	,147	- ,06161	,08940	-,21046	,03166
SELF_EVERYDAY	Eq.var.ass.	,315	,575	,091	485	,927	,00500	,05487	-,10282	,11282
SCHOLARLY	Eq.var.ass.	,439	,508	-,965	485	,335	- ,06792	,06555	-,19901	,06791
PERFORMAN CE	Eq.var.ass.	,862	,354	-,134	485	,894	-,0138	,10331	-,21680	,18920
MECH-SCIENT	Eq.var.ass.	1,267	,261	-5,004	485	,000	- ,10244	,51261	-,71388	- ,31134
ARTISTIC	Eq.var.ass.	2,188	,140	1,189	485	,235	,10526	,08853	-,06868	,27920

*2.4.3.3. Correlations between entrepreneurship and creativity*

Taking into consideration that we are researching the entrepreneurship and creativity competencies of young people, from High School to Faculty, we envisaged it as convenient to look for the correlation between K-DOCS and ENTRECOM global scores. In this respect, the “r of Pearson” test has returned a value of .425 ( $p<.001$ ), meaning a positive medium strength correlation with strong significance.

*2.4.3.3.1. Correlations for the overall sample (N=489)*

When we search for a correlation between K-DOCS dimensions, the Pearson test presented the following displayed in Table 47. Of most importance are the correlations between ENTRECOMP and K-DOCS dimensions, which, being all positive and very significant, ranged from small (.217, .231, .231, respectively for Artistic, Mechanical/Scientific and Performance creativity) to moderate (.474), regarding Scholarly achievement) and high (.536) for Self-Everyday creativity. These results point to a worrisome low proficiency of some nuclear

dimensions of creativity in association with entrepreneurship, showing the Romanian sample that entrepreneurship is specially connected to Self-Everyday creativity and Scholarly achievement.

*Table 47: ENTRECOM\*K-DOCS Correlations – Romanian overall results*

Dimensions		ENTRECOM _TOT	SELF_EVERY DAY	SCHOLARL Y	PERFORM ANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,536**	,474**	,231**	,231**	,217**
	Sig.		,000	,000	,000	,000	,000
	N	489	489	489	489	489	489
SELF_EVERYDAY	Pearson r	,536**	1	,580**	,351**	,256**	,314**
	Sig.	,000		,000	,000	,000	,000
	N	489	489	489	489	489	489
SCHOLARLY	Pearson r	,474**	,580**	1	,466**	,367**	,468**
	Sig.	,000	,000		,000	,000	,000
	N	489	489	489	489	489	489
PERFORMANCE	Pearson r	,231**	,351**	,466**	1	,460**	,574**
	Sig.	,000	,000	,000		,000	,000
	N	489	489	489	489	489	489
MECH-SCIENT	Pearson r	,231**	,256**	,367**	,460**	1	,513**
	Sig.	,000	,000	,000	,000		,000
	N	489	489	489	489	489	489
ARTISTIC	Pearson r	,217**	,314**	,468**	,574**	,513**	1
	Sig.	,000	,000	,000	,000	,000	
	N	489	489	489	489	489	489

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

#### 2.4.3.3.2. Correlations for the high school sample (N=73)

Specifically, for those of High School education level, we have found positive very significant correlations between ENTRECOM and K-DOCS (Table 48), ranging from near zero (.074, .083, for Performance and Mechanical/Scientific respectively) to small (.272 for Scholarly and .225 for Artistic). While the correlation based on the overall data, for this education level, can be considered positive and moderate (.342).

*Table 48: ETRECOM\*K-DOCS Correlations – Romanian High School participants*

Dimensions		ENTRECOM _TOT	SELF_EVE RYDAY	SCHOLARL Y	PERFORMA NCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,717**	,272*	,074	,083	,225
	Sig.		,000	,020	,532	,484	,056
	N	73	73	73	73	73	73
SELF_EVERYDAY	Pearson r	,717**	1	,436**	,248*	-,045	,269*
	Sig.	,000		,000	,035	,708	,021
	N	73	73	73	73	73	73
SCHOLARLY	Pearson r	,272*	,436**	1	,453**	,205	,314**
	Sig.	,020	,000		,000	,082	,007
	N	73	73	73	73	73	73
PERFORMANCE	Pearson r	,074	,248*	,453**	1	,436**	,608**
	Sig.	,532	,035	,000		,000	,000
	N	73	73	73	73	73	73
MECH-SCIENT	Pearson r	,083	-,045	,205	,436**	1	,540**
	Sig.	,484	,708	,082	,000		,000
	N	73	73	73	73	73	73
ARTISTIC	Pearson r	,225	,269*	,314**	,608**	,540**	1
	Sig.	,056	,021	,007	,000	,000	
	N	73	73	73	73	73	73

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

\* . Correlation is significant at the 0.05 level (2-tailed).

#### 2.4.3.3.3. Correlations for the undergraduate sample (N=288)

As to those of undergraduate education level, we have also found a positive overall medium (.450) and a very significant correlation, between ENTRECOM and K-DOCS. Besides, we have found very significant positive correlations between ENTRECOM and K-DOCS dimensions, namely of small strength (.208, .244 and .274 for Artistic, Performance and Mechanical/Scientific dimensions of creativity, respectively) and of high strength (.534 and .505 for Scholarly and Everyday dimensions of creativity, respectively), as shown in Table 49.

*Table 49: ETRECOM\*K-DOCS Correlations – Romanian Undergraduate participants*

Dimensions		ENTRECOM _TOT	SELF_EVERY DAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,505**	,534**	,244**	,274**	,208**
	Sig.		,000	,000	,000	,000	,000
	N	288	288	288	288	288	288
SELF_EVERYDAY	Pearson r	,505**	1	,629**	,361**	,300**	,274**
	Sig.	,000		,000	,000	,000	,000
	N	288	288	288	288	288	288
SCHOLARLY	Pearson r	,534**	,629**	1	,435**	,402**	,469**
	Sig.	,000	,000		,000	,000	,000
	N	288	288	288	288	288	288
PERFORMANCE	Pearson r	,244**	,361**	,435**	1	,421**	,566**
	Sig.	,000	,000	,000		,000	,000
	N	288	288	288	288	288	288
MECH-SCIENT	Pearson r	,274**	,300**	,402**	,421**	1	,489**
	Sig.	,000	,000	,000	,000		,000
	N	288	288	288	288	288	288
ARTISTIC	Pearson r	,208**	,274**	,469**	,566**	,489**	1
	Sig.	,000	,000	,000	,000	,000	
	N	288	288	288	288	288	288

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

#### 2.4.3.3.4. Correlations for the graduate sample (N=128)

Concerning graduate education level, we have also found a positive overall medium (.402) and a positive very significant correlation, between ENTRECOM and K-DOCS. In addition, we have found very significant correlations between ENTRECOM and K-DOCS dimensions (Table 50), namely of small strength (.207, .234 and .281 for Mechanical/Scientific, Artistic and Performance dimensions of creativity, respectively) and of medium strength (.422 for Scholarly dimension of creativity), as well as of high strength (.526) for Self-Everyday dimension of creativity.

*Table 50: ETRECOM & K-DOCS Correlations – Romanian Graduate participants*

Dimensions		ENTRECOM _TOT	SELF_EVE RYDAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,526**	,422**	,281**	,207*	,234**
	Sig.		,000	,000	,001	,019	,008
	N	128	128	128	128	128	128

SELF_EVERYDAY	Pearson r	,526**	1	,544**	,383**	,332**	,442**
	Sig.	,000		,000	,000	,000	,000
	N	128	128	128	128	128	128
SCHOLARLY	Pearson r	,422**	,544**	1	,566**	,382**	,553**
	Sig.	,000	,000		,000	,000	,000
	N	128	128	128	128	128	128
PERFORMANCE	Pearson r	,281**	,383**	,566**	1	,566**	,588**
	Sig.	,001	,000	,000		,000	,000
	N	128	128	128	128	128	128
MECH-SCIENT	Pearson r	,207**	,332**	,382	,566**	1	,585**
	Sig.	,019	,000	,000	,000		,000
	N	128	128	128	128	128	128
ARTISTIC	Pearson r	,234**	,442**	,553**	,588**	,585**	1
	Sig.	,008	,000	,000	,000	,000	
	N	128	128	128	128	128	128

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

#### 2.4.3.4. Variations in entrepreneurship and creativity as a function of school level

To test for differences in entrepreneurship and creativity (including its five dimensions) at the high school, undergraduate and graduate educational levels, oneway ANOVAs were carried out. Performing the inspection of ANOVA's assumptions no problem was detected in all of the analysis concerning homoscedasticity (Levene tests -  $p > .05$ ). First, Table 51 shows the descriptive statistics and Table 51 presents the ANOVA results for ENTRECO-TOT\*K-DOCS TOT including its five dimensions.

Table 51: Descriptive statistics of ENTRECOM\*K-DOCS as a function of educational level

Dimensions		N	Mean	Std. Dev.
ENTRECOM_TOT	High School	73	3,9379	,42880
	Undergraduate	288	4,0025	,46119
	Graduate	128	4,0792	,47361
	Total	489	4,0130	,46114
KDOCS_TOT	High School	73	3,3742	,52049
	Undergraduate	288	3,4127	,59923
	Graduate	128	3,4456	,60427
	Total	489	3,4156	,58879
SELF_EVERYDAY	High School	73	4,0112	,51781
	Undergraduate	288	4,0316	,53858
	Graduate	128	4,0241	,50255
	Total	489	4,0266	,52529

SCHOLARLY	High School	73	3,5666	,64381
	Undergraduate	288	3,6733	,66799
	Graduate	128	3,7514	,60254
	Total	489	3,6778	,64911
PERFORMANCE	High School	73	3,0301	,87665
	Undergraduate	288	3,0097	1,01108
	Graduate	128	3,0070	,99915
	Total	489	3,0121	,98715
MECH-SCIENT	High School	73	2,8250	1,00648
	Undergraduate	288	2,7265	,99354
	Graduate	128	2,8958	1,02518
	Total	489	2,7855	1,00449
ARTISTIC	High School	73	3,2922	,73435
	Undergraduate	288	3,4718	,88012
	Graduate	128	3,4019	,82114
	Total	489	3,4267	,84538

The comparisons between the three educational levels in Table 52 show that there are no significant differences either for ENTRECOM or K-DOCS.

*Table 52: ANOVA statistics for testing differences in ENTRECOM\*K-DOCS as a function of educational levels*

Dimensions		Sum of Squares	df	Mean Square	F	p	$\chi^2$	p
ENTRECOM_TOT	Bet. Groups	1,004	2	,502	2,373	,094	1,004	2
	With. Groups	102,768	486	,211			102,768	486
	Total	103,771	488				103,771	488
KDOCS_TOT	Bet. Groups	,243	2	,121	,349	,706	,243	2
	With. Groups	168,933	486	,348			168,933	486
	Total	169,176	488				169,176	488
SELF EVERYDAY	Bet. Groups	,025	2	,013	,045	,956	,025	2
	With. Groups	134,629	486	,277			134,629	486
	Total	134,654	488				134,654	488
SCHOLARLY	Bet. Groups	1,602	2	,801	1,908	,149	1,602	2
	With. Groups	204,012	486	,420			204,012	486
	Total	205,614	488				205,614	488



PERFORMANCE	Bet. Groups	,029	2	,014	,015	,985	,029	2
	With. Groups	475,510	486	,978			475,510	486
	Total	475,539	488				475,539	488
MECH-SCIENT	Bet. Groups	2,676	2	1,338	1,328	,266	2,676	2
	With. Groups	489,715	486	1,008			489,715	486
	Total	492,391	488				492,391	488
ARTISTIC	Bet. Groups	1,985	2	,993	1,391	,250	1,985	2
	With. Groups	346,775	486	,714			346,775	486
	Total	348,760	488				348,760	488

Concerning differences between areas of studies, it was not possible to perform the ANOVA test or other nonparametric tests because of the dispersion by areas and the very low Ns in the subsamples.

## 2.5. Analysis of the Spanish results (N=255)

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### 2.5.1. Scales reliability analysis of K-DOCS

Spanish results replaced reliability regarding the total samples (N:225) and of the fifty K-DOCS items of .939 (Cronbach's Alpha) which is considered excellent. Regarding the K-DOCS dimensions' reliability, values are reported in Table 53, which are all considered acceptable and some high.

*Table 53: Cronbach's Alpha Values of Dimensions*

K-DOCS DIMENSIONS	SPANISH VALUES
1 – Everyday	.079 (items 1-11)
2 – Scholarly	.873 (items 12-22)
3 – Performance	.907 (items 23-32)
4 – Mechanical/Scientific	.923 (items 33-41)
5 – Artistic	.868 (items 42-50)

Concerning ENTRECOM, global Cronbach's Alpha of Spanish participants was .863, which is a good and reliable indicator.

### 2.5.2. Descriptive analysis

Of the 225 Spanish participants declared to be “female” 181 (80.4%), “males” 43 (19.1%) and 1 (0.4%) referred to be of “other” gender.

Regarding the age, the Spanish group starts from an age of 18 and the following distribution was found as shown in Table 54.

*Table 54: Age Groups: Spanish descriptive statistics*

Age Group	Frequency	Percent
18 age	9	4.0
19 age	49	21.8
20 age	44	19.6
21 age	41	18.2
22 age and older	82	36.4

Consequently, the values of the answer to the question of “level of education” are 1 (0.4%) declared being at High School, 181 (80.4%) said to be at the undergraduate level and 43 (19.1%) are undergraduate.

Referring to K-DOCS, Table 55 shows the descriptive results for the Spanish participants in the survey. The higher mean refers to the “Everyday Dimension” of self-perceived creativity (3.99) and the lower to “MECH-SCIENT” (2.86), while being all scores, of the given population, above the midpoint of the response scale of 2.5.

*Table 55: K-DOCS Spanish Descriptive Results*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Stat.	Std. Error
KDOCS_TOT	225	1.00	5.00	3,4725	0,56588	-,025	.162	-0,466	.323
SELF_EVERYDAY	225	1.00	5.00	3,9858	0,48727	-,309	.162	0,478	.323
SCHOLARLY	225	1.00	5.00	3,5478	0,65012	-,333	.162	0,251	.323
PERFORMANCE	225	1.00	5.00	3,2413	0,95137	-,256	.162	-0,657	.323
MECH-SCIENT	225	1.00	5.00	2,8567	1,06522	,046	.162	-0,996	.323
ARTISTIC	225	1.00	5.00	3,6256	0,80028	-,602	.162	0,34	.323
Valid N (listwise)	225								

Referring to ENTRECOM, Spanish values are presented in Table 56 underlining a mean of 3.9, also above the midpoint of the response scale of 2.5 and even closer to the top value of 5.

*Table 56: ENTRECOM Spanish descriptive statistics*

Dimension	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Statistic	Std. Error
ENTRECOM_TOT	225	1	5	3,8758	0,46838	-0,2	0,162	0,194	0,323

### 2.5.3. Inferential analysis

#### 2.5.3.1. Age, entrepreneurship and creativity

Age could be considered a very interesting variable for understanding entrepreneurship and creativity competencies. The correlation between age and ENTRECOM score doesn't report any significant results (Table 57).

*Table 57: Age & K-DOCS Correlations – Spanish overall results*

	Age	ENTRECOM_TOT	KDOCS_TOT	SELF_EVERYDAY	SCHOLARLY	PERFORMANCE	MECH-SCIENT	ARTISTIC
Age Spearman	1	-,059	-,031	-,100	,065	,010	-,089	-,024
Sig.		,380	,649	,134	,334	,876	,183	,723
N		225	225	225	225	225	225	225

#### 2.5.3.2. Gender, entrepreneurship and creativity

Gender has also been commonly considered an important variable to study entrepreneurship and creativity. Some differences between gender and K-DOCS (Table 58), are underlined by the Independent Samples Test for the K-DOCS dimensions of Mechanical/Scientific creativity dimension and Artistic dimension. For the first dimension, males' mean (3.1) appears superior to females (2.79) ( $t=1,697, p<.001$ ), conversely Artistic creativity has females' mean (3.69) ( $t=2.659, p<.001$ ) higher than the males' mean (3.34). These results deserve consideration and broad study to understand the meaning behind such differences. On the ENTRECOMP scale, the statistics don't report significant differences.

*Table 58: T-test for K-DOCS Gender Differences – Spanish overall results*

Dimensions	Levene's Test for Equality of Variances				t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
ENTRECOM_TOT	Eq.var.ass.	2,179	0,141	0,364	222	0,358	0,43582	1,19683	-1,92278	2,79442
KDOCS_TOT	Eq.var.ass.	6,218	0,013	0,762	222	0,224	3,66812	4,81528	-5,82138	13,15762
	Eq.var.ass.			0,894	79,535	0,187	3,66812	4,10249	-4,49682	11,83307
SELF Everyday	Eq.var.ass.	0,243	0,623	3,268	222	<,001	2,90158	0,88791	1,15177	4,65139
SCHOLARLY	Eq.var.ass.	0,382	0,537	-0,606	222	0,272	-0,7384	1,21761	-3,13796	1,66115
PERFORMANCE	Eq.var.ass.	0,006	0,937	0,649	222	0,258	1,05075	1,61797	-2,13779	4,2393
MECH-SCIENT	Eq.var.ass.	4,238	0,041	-1,697	222	0,046	-2,7523	1,6217	-5,94813	0,4436
	Eq.var.ass.			-1,881	72,659	0,358	-2,7523	1,4621	-5,66817	0,1636
ARTISTIC	Eq.var.ass.	0,031	0,86	2,659	222	0,372	3,20648	1,20601	0,82978	5,58317

In line with our research some considerations about the entrepreneurship and creativity competencies of young people, from High School to Faculty, were analysed with the correlation between K-DOCS and ENTRECOM global scores. The “r of Pearson” test has indicated a value of  $r=.469$  ( $p<.001$ ), meaning a positive medium strength correlation with strong significance.

*2.5.3.3. Correlations between entrepreneurship and creativity*

Taking into consideration that we are researching the entrepreneurship and creativity competencies of young people, from High School to Faculty, we envisaged it as convenient to look for the correlation between K-DOCS and ENTRECOM global scores. In this respect, the “r of Pearson” test has returned a value of  $.469$  ( $p<.001$ ), meaning a positive medium strength correlation with strong significance.

*2.5.3.3.1. Correlations for the overall sample (N=225)*

The Pearson test indicates the following results displayed in Table 59. All the dimensions are correlated. The correlations between ENTRECOMP and K-DOCS dimensions, which are the most noteworthy, are all positive and very significant, ranging from small ( $.242, .264, .280$  respectively for Mechanical/Scientific, Performance and Artistic creativity) to high ( $.497$  for Scholarly Achievement and  $.529$  for Everyday creativity). These results underline that for the Spanish sample, entrepreneurship is especially connected to Scholarly Achievement and Everyday creativity.

*Table 59: ENTRECOM & K-DOCS Correlations –Spanish overall results*

Dimensions		ENTRE COM_TOT	SELF_EVERY DAY	SCHOLARL Y	PERFORM ANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,529**	,497**	,280**	,242**	,264**
	Sig.		<,001	<,001	<,001	<,001	<,001
	N	225	225	225	225	225	225
SELF_EVERYDAY	Pearson r	,529**	1	,476**	,243**	,257**	,353**
	Sig.	<,001		<,001	<,001	<,001	<,001
	N	225	225	225	225	225	225
SCHOLARLY	Pearson r	,497**	,476**	1	,311**	,345**	,355**
	Sig.	<,001	<,001		<,001	<,001	<,001
	N	225	225	225	225	225	225
PERFORMANCE	Pearson r	,280**	,243**	,311**	1	,544**	,537**
	Sig.	<,001	<,001	<,001		<,001	<,001
	N	225	225	225	225	225	225
MECH-SCIENT	Pearson r	,242**	,257**	,345**	,544**	1	,525**
	Sig.	<,001	<,001	<,001	<,001		<,001
	N	225	225	225	225	225	225
ARTISTIC	Pearson r	,264**	,353**	,355**	,537**	,525**	1
	Sig.	<,001	<,001	<,001	<,001	<,001	
	N	225	225	225	225	225	225

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

#### 2.5.3.3.2. Correlations for the high school sample (N=1)

The participants with education level High School are only 1. It cannot be calculated because at least one of the variables is constant.

#### 2.5.3.3.3. Correlations for the undergraduate sample (N=181)

Regarding undergraduate education level, results show a positive overall medium (.532) and a very significant correlation, between ENTRECOM and K-DOCS. Further, very significant positive correlations appear also between ENTRECOM and K-DOCS dimensions, namely of small strength (.230, .253, .261 for Performance creativity, Mechanical/Scientific dimensions of creativity and artistic creativity respectively) and of high strength (.473 and .532 for Scholarly and Everyday dimensions of creativity, respectively), as reported in Table 60.

*Table 60: ETRECOM & K-DOCS Correlations – Spanish Undergraduate participants*

Dimensions		ENTRECOM _TOT	SELF_EVE RYDAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,532**	,473**	,230**	,253**	,261**
	Sig.		<,001	<,001	,002	<,001	<,001
	N	181	181	181	181	181	181
SELF_EVERYDAY	Pearson r	,532**	1	,523**	,231**	,243**	,343**
	Sig.	<,001		<,001	,002	<,001	<,001
	N	181	181	181	181	181	181
SCHOLARLY	Pearson r	,473**	,523**	1	,265**	,377**	,391**
	Sig.	<,001	<,001		<,001	<,001	<,001
	N	181	181	181	181	181	181
PERFORMANCE	Pearson r	,230**	,231**	,265**	1	,568**	,555**
	Sig.	,002	,002	<,001		<,001	<,001
	N	181	181	181	181	181	181
MECH-SCIENT	Pearson r	,253**	,243**	,377**	,568**	1	,531**
	Sig.	<,001	<,001	<,001	<,001		<,001
	N	181	181	181	181	181	181
ARTISTIC	Pearson r	,261**	,343**	,391**	,555**	,531**	1
	Sig.	<,001	<,001	<,001	<,001	<,001	
	N	181	181	181	181	181	181

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

#### 2.5.3.3.4. Correlations for the graduate sample (N=184)

For the graduate education level of the Spanish participants, we have also found a positive overall high (.496) and positive very significant correlations, between ETRECOM and K-DOCS. In the same line, we have found very significant correlations between ETRECOM and K-DOCS dimensions (Table 61), namely of small strength .209, .280 (for Mechanical/Scientific dimensions of creativity and Artistic dimension of creativity respectively), and of high strength .504, .529 and .597 (for Performance, Self-Everyday and Scholarly dimensions of creativity respectively).

*Table 61: ETRECOM\*K-DOCS Correlations – Spanish Graduate participants*

Dimensions		ENTRECOM _TOT	SELF_EVE RYDAY	SCHOLARLY	PERFORM ANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,529**	,597**	,504**	,209	,280
	Sig.		<,001	<,001	<,001	,178	,069
	N	43	43	43	43	43	43

SELF EVERYDAY	Pearson r	,529**	1	,309*	,303*	,296	,403**
	Sig.	<,001		,044	,049	,054	,007
	N	43	43	43	43	43	43
SCHOLARLY	Pearson r	,597**	,309*	1	,489**	,239	,223
	Sig.	<,001	,044		<,001	,123	,151
	N	43	43	43	43	43	43
PERFORMANCE	Pearson r	,504**	,303*	,489**	1	,452**	,466**
	Sig.	<,001	,049	<,001		,002	,002
	N	43	43	43	43	43	43
MECH-SCIENT	Pearson r	,209	,296	,239	,452**	1	,514**
	Sig.	,178	,054	,123	,002		<,001
	N	43	43	43	43	43	43
ARTISTIC	Pearson r	,280	,403**	,223	,466**	,514**	1
	Sig.	,069	,007	,151	,002	<,001	
	N	43	43	43	43	43	43

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

\*Correlation is significant at the 0.05 level (2-tailed).

#### 2.5.3.4. Variations in entrepreneurship and creativity as a function of school level

To test for differences in entrepreneurship and creativity (including its five dimensions) at the high school, undergraduate and graduate educational levels, oneway ANOVAs were carried out. Performing the inspection of ANOVA's assumptions no problem was detected in all of the analysis concerning homoscedasticity (Levene tests -  $p > .05$ ). Table 62 shows the descriptive statistics.

Table 62: Descriptive statistics of ENTRECOM & K-DOCS as a function of educational level

Dimensions		N	Mean	St. Dev.
ENTRECOM	High School	1	4	
	TOT	181	3,8637	0,47484
	Graduate	43	3,9240	0,44758
	Total	225	3,8758	0,46838
KDOCS	High School	1	4	
	TOT	181	3,4650	0,56920
	Graduate	43	3,4916	0,55865
	Total	225	3,4725	0,56588



KDOCS	High School	1	4,3636	
SELF	Undergraduate	181	3,9944	0,49331
EVERYDAY	Graduate	43	3,9408	0,46646
TOT	Total	225	3,9858	0,48727
KDOCS	High School	1	4	
SCHOLARLY	Undergraduate	181	3,5097	0,64479
TOT	Graduate	43	3,6976	0,66204
	Total	225	3,5478	0,65012
KDOCS	High School	1	3,7	
PERFORMANCE	Undergraduate	181	3,2198	0,95872
TOT	Graduate	43	3,3209	0,93517
	Total	225	3,2413	0,95137
KDOCS	High School	1	4,2222	
MECHANICAL_SCIENTIFIC	Undergraduate	181	2,8753	1,06120
TOT	Graduate	43	2,7467	1,08034
	Total	225	2,8567	1,06522
KDOCS	High School	1	3,6666	
ARTISTIC	Undergraduate	181	3,6255	0,79514
TOT	Graduate	43	3,6253	0,84027
	Total	225	3,6256	0,80028

It was not possible to compare the three educational levels because of the small sample size of high-school students (N=1). Table 63 presents the comparison between undergraduate and graduate students and it shows no significant differences.

*Table 63: T-test for educational level differences at K-DOCS*

		Levene's Test for Equality of Variances				t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ENTRECOM_TOT	Eq.var.ass.	1,055	,306	-,757	222	,450	-,06031	,07970	-,21738	,09676
KDOCS_TOT	Eq.var.ass.	,051	,822	-,276	222	,783	-,02655	,09623	-,21618	,16309
SELF_EVERYDAY	Eq.var.ass.	,615	,434	,648	222	,518	,05367	,08285	-,10960	,21694
SCHOLARLY	Eq.var.ass.	,102	,749	-1,709	222	,089	-,18788	,10995	-,40455	,02879
PERFORMANCE	Eq.var.ass.	,000	,990	-,624	222	,533	-,10104	,16190	-,42010	,21801
MECH-SCIENT	Eq.var.ass.	,007	,933	,712	222	,477	,12861	,18065	-,22740	,48462
ARTISTIC	Eq.var.ass.	1,055	,306	-,757	222	,450	-,06031	,07970	-,21738	,09676

## 2.6. Analysis of Türkiye results (N=749)

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### 2.6.1. Scales reliability analysis of K-DOCS

Türkiye's results returned reliability regarding the total samples (N=749) and of the fifty K-DOCS items of .938 (Cronbach's Alpha) which is considered excellent. As to K-DOCS dimensions' reliability, values varied as follows in Table 64, which are all considered acceptable, while fairly high.

*Table 64: Cronbach's Alpha Values of K-DOCS Dimensions*

K-DOCS DIMENSIONS	TÜRKİYE VALUES
1 – Everyday	.789 (items 1-11)
2 – Scholarly	.878 (items 12-22)
3 – Performance	.876 (items 23-32)
4 – Mechanical/Scientific	.912 (items 33-41)
5 – Artistic	.850 (items 42-50)

Concerning ENTRECOM, the global Cronbach's Alpha of Turkish results was .903, a good and reliable indicator.

### 2.6.2. Descriptive analysis

Of the 749 Turkish respondents, 501 (66.9%) declared to be “male”, 245 (32.7%) “female” and 3 (0.4%) referred to themselves as being of “other” gender.

Regarding age, we have found the following distribution (Table 65).

*Table 65: Age Groups of Turkish Descriptive Statistics*

Age Group	Frequency	Percent
17 age	10	1.3
18 age	65	8.7
19 age	109	14.6
20 age	173	23.1
21 age	156	20.8
22 age and older	236	31.5

The above values could be well understood by considering the answers to the question of “level of education”, to which 16 (2.1%) declared being at High School. 691 (92.3%) were said to be undergraduate level and 42 (5.6%) in graduation courses.

As to K-DOCS, Table 66 presents the descriptive results for the Turkish participants in the survey. The higher mean refers to the “Self-Everyday Dimension” of self-perceived creativity (3.82) and the lower to “MECH-SCIENT” (3.00), while being all scores, of the giving population, above the midpoint of the response scale of 2.5. When the Skewness and Kurtosis values are examined, it is seen that the data collected regarding the total value and sub-dimensions of the Kaufman creativity questionnaire are statistically normally distributed.

*Table 66: K-DOCS Turkish Descriptive Results*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Error	Stat.	Error
KDOCS_TOT	749	1,12	5.00	3,3646	,61059	-,160	,089	-,005	,178
SELF_EVERYDAY	749	1,36	5.00	3,8233	,55874	-,464	,089	,945	,178
SCHOLARLY	749	1,00	5.00	3,4545	,71505	-,345	,089	,298	,178
PERFORMANCE	749	1,00	5.00	3,0700	,93482	-,081	,089	-,644	,178
MECH-SCIENT	749	1,00	5.00	3,0045	1,10597	,050	,089	-1,095	,178
ARTISTIC	749	1,00	5.00	3,3818	,86811	-,307	,089	-,320	,178

In regard to ENTRECOM, Turkish results (Table 67) present a mean of 3.7, also above the midpoint of the response scale of 2.5 and even closer to the top value of 5. When Skewness and Kurtosis values are analyzed, it is seen that ENTROCOM data are not statistically normally distributed, and the high Kurtosis value (3.953) indicates that there are spikes in the data distribution (Tabachnick & Fidell, 2013).

*Table 67: ENTRECOM Turkish descriptive statistics*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Statistic	Std. Error
ENTRECOM_TOT	749	1.00	5.00	3.7056	.58048	-1.322	.089	3.953	.178

### 2.6.3. Inferential analysis

#### 2.6.3.1. Age, entrepreneurship and creativity

Age could be considered a very interesting variable for understanding entrepreneurship and creativity competencies. In this regard (Table 68), applying non-parametric Spearman’s rho test, we found very low positive and negative correlations between age and K-DOCS total score, although concerning its dimensions some being significant, some not and even very significant

but still low. As to the correlation between age and ENTRECOM score, we found a very low positive correlation.

When we look at the correlation between ENTRECOM and K-DOCS total score, it is seen that there is a medium correlation (.462) between them and it is very significant. The correlation between ENTRECOM and K-DOCS dimensions score, there is moderate to low correlation between them and they are very significant. Correlation values range from small (.233, .297, and .321 respectively for Mechanical/Scientific, Artistic and Performance creativity) to moderate (.472 for Scholarly Achievement and .504 for Everyday creativity).

*Table 68: Age & K-DOCS Correlations – Turkish overall results*

Dimensions		Age	ENTREC OM_TOT	KDOCS _TOT	SELF_EV ERYDAY	SCHOLA RLY	PERFOR MANCE	MECH- SCIENT	ARTISTI C	
Spearman	Age	Corrl.Coeff.	1,000	,064	,012	,029	,129**	-,073*	,045	-,083*
		Sig.	.	,078	,736	,423	,000	,045	,217	,023
		N	749	749	749	749	749	749	749	749

\*Correlation is significant at the 0.05 level (2-tailed).

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

### 2.6.3.2. Gender, entrepreneurship and creativity

Gender has also been commonly considered an important variable to study entrepreneurship and creativity. The statistical data on gender-related K-DOCS, ENTRECOMP, and K-DOCS dimensions are given in Table 69.

*Table 69: Gender Groups of Turkish Descriptive Statistics*

Dimensions	Gender	N	Mean	Std. Deviation	Std. Error Mean
ENTRECOMP_TOT	Male	501	3,6970	,53826	,02405
	Female	245	3,7208	,65996	,04216
KDOCS_TOT	Male	501	3,3723	,61802	,02761
	Female	245	3,3476	,59932	,03829
SELF_EVERYDAY	Male	501	3,8499	,57051	,02549
	Female	245	3,7748	,52782	,03372
SCHOLARLY	Male	501	3,4371	,72317	,03231
	Female	245	3,4924	,69696	,04453
PERFORMANCE	Male	501	3,1068	,93906	,04195
	Female	245	2,9918	,92649	,05919
MECH-SCIENT	Male	501	2,8940	1,11479	,04981
	Female	245	3,2263	1,05923	,06767
ARTISTIC	Male	501	3,4828	,84514	,03776
	Female	245	3,1651	,87672	,05601

We sought to analyse differences between gender regarding K-DOCS (Table 70), but the Independent Samples Test returned no significant results, except for K-DOCS dimensions of Mechanical/Scientific creativity, where females' mean (3.23) appears, with a very significant value, as superior to males (2.89) ( $t = 3,886, p < .001$ ), and Artistic creativity, where, on the contrary, males' mean (3.48) ( $t = -4,763, p < .001$ ) showed to be higher than the females' result (3.17). An outcome that deserves reflection and broad study to understand the reasons behind such differences and their meanings. Now, concerning ENTRECOMP, no significant differences could be found ( $t = .526, p = .624 > .05$ ).

*Table 70: T-test for K-DOCS Gender Differences – Turkish overall results*

Dimensions	Levene's Test for Equality of Variances			t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error	95% Confidence Interval of the Difference		
								Lower	Upper	
ENTRECOM_TOT	Eq.var.ass.	7,132	,008	,526	744	,599	,02381	,04529	-,06511	,11273
	Eq.var.ass.			,491	407,522	,624	,02381	,04854	-,07161	,11923
KDOCS_TOT	Eq.var.ass.	,229	,633	-,519	744	,604	-,02474	,04771	-,11840	,06891
SELF EVERYDAY	Eq.var.ass.	1,037	,309	-1,731	744	,084	-,07517	,04341	-,16040	,01006
SCHOLARLY	Eq.var.ass.	,950	,330	,992	744	,322	,05527	,05572	-,05411	,16465
PERFORMANCE	Eq.var.ass.	,121	,729	-1,577	744	,115	-,11495	,07289	-,25804	,02814
MECH-SCIENT	Eq.var.ass.	,829	,363	3,886	744	,000	,33231	,08551	,16444	,50019
ARTISTIC	Eq.var.ass.	,106	,745	-4,763	744	,000	-,31773	,06670	-,44868	-,18678

Taking in consideration that we are researching the entrepreneurship and creativity competencies of young people, from High School to Faculty, we envisaged it as a convenience to look for the correlation between K-DOCS and ENTRECOM global scores. In this respect, the “r of Spearman's rho” test has returned a value of .462 ( $p < .001$ ), meaning a positive medium strength correlation with strong significance.

### 2.6.3.3. Correlations between entrepreneurship and creativity

When we search for a correlation between K-DOCS-TOT and ENTRECOMP-TOT, the Pearson test was applied and returned a moderate positive correlation of .424 ( $p < .001$ ).

#### 2.6.3.3.1. Correlations for the overall sample (N=749)

When we search for a correlation between K-DOCS dimensions and ENTRECOMP, Pearson test was applied to present the data displayed in Table 71.

Of most importance are the correlations between ENTRECOMP and K-DOCS dimensions score, which, being all positive and very significant, ranged from small (.206, .275 and .295,

respectively for Mechanical/Scientific, Artistic and Performance creativity, to moderate (.394 for Scholarly Achievement and .471 for Self-Everyday creativity). These results point to a worrisome low proficiency of some nuclear dimensions of creativity in association with entrepreneurship, showing the Turkish sample that entrepreneurship is especially connected to Self-Everyday and Scholarly creativity.

*Table 71: ENTRECOM & K-DOCS Correlations – Turkish overall results*

Dimensions		ENTRECO	SELF_EVERYD	PERFORMA		MECH-	ARTISTIC
		M_TOT	AY	SCHOLARLY	NCE	SCIENT	
ENTRECOM_TOT	Pearson r	1	,471**	,394**	,295**	,206**	,275**
	Sig.		,000	,000	,000	,000	,000
	N	749	749	749	749	749	749
SELF_EVERYDAY	Pearson r	,471**	1	,523**	,383**	,307**	,349**
	Sig.	,000		,000	,000	,000	,000
	N	749	749	749	749	749	749
SCHOLARLY	Pearson r	,394**	,523**	1	,425**	,394**	,430**
	Sig.	,000	,000		,000	,000	,000
	N	749	749	749	749	749	749
PERFORMANCE	Pearson r	,295**	,383**	,425**	1	,530**	,533**
	Sig.	,000	,000	,000		,000	,000
	N	749	749	749	749	749	749
MECH-SCIENT	Pearson r	,206**	,307**	,394**	,530**	1	,422**
	Sig.	,000	,000	,000	,000		,000
	N	749	749	749	749	749	749
ARTISTIC	Pearson r	,275**	749	,430**	,533**	,422**	1
	Sig.	,000	,000	,000	,000	,000	,000
	N	749	749	749	749	749	749

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

#### 2.6.3.3.2. Correlations for the high-school sample

K-DOCS and ENTROCOM data about high school were not analysed due to insufficient high school data (N= 1).

#### 2.6.3.3.3. Correlations for the Undergraduate sample (N=691)

Specifically, for those of Undergraduate education level, we have found positive very significant correlations between ENTRECOM and K-DOCS dimensions (Table 72), ranging from small (.173 for Mechanical/Scientific creativity) to medium (.270, .273 and .396 for Performance, Artistic, Scholarly creativity respectively) and high (.472 for Everyday creativity). While the correlation based on the overall data, for this education level, can be considered positive and moderate (.448), as well as very significant.

*Table 72: ENTRECOM & K-DOCS Correlations – Turkish Undergraduate school participants*

Dimensions		ENTRECO	SELF_EVERYD	PERFORMA		MECH-	ARTISTIC
		M_TOT	AY	SCHOLARLY	NCE	SCIENT	
ENTRECOM_TOT	Pearson r	1	,472**	,396**	,270**	,173**	,273**
	Sig.		,000	,000	,000	,000	,000
	N	691	691	691	691	691	691
SELF_EVERYDAY	Pearson r	,472**	1	,517**	,394**	,301**	,364**
	Sig.	,000		,000	,000	,000	,000
	N	691	691	691	691	691	691
SCHOLARLY	Pearson r	,396**	,517**	1	,426**	,379**	,440**
	Sig.	,000	,000		,000	,000	,000
	N	691	691	691	691	691	691
PERFORMANCE	Pearson r	,270**	,394**	,426**	1	,523**	,519**
	Sig.	,000	,000	,000		,000	,000
	N	691	691	691	691	691	691
MECH-SCIENT	Pearson r	,173**	,301**	,379**	,523**	1	,413**
	Sig.	,000	,000	,000	,000		,000
	N	691	691	691	691	691	691
ARTISTIC	Pearson r	,273**	,364**	,440**	,519**	,413**	1
	Sig.	,000	,000	,000	,000	,000	
	N	691	691	691	691	691	691

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

#### 2.6.3.3.4. Correlations for the graduation sample (N=42)

During the data collection process in Türkiye, the data were collected from 42 graduate students. Skewness and Kurtosis values are given in Table 73 below. According to these values, ENTRECOM data are not normally distributed. K-DOCS and dimensions values are acceptable for normal distribution.

*Table 73: Graduate students - Turkish descriptive statistic*

Dimensions	N	Minimum	Maximum	Mean	Std.	Skewness	Kurtosis	Std. Error	Std. Error
					Deviation				
Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
ENTRECOM_TOT	42	1,00	5,00	3,9587	,94280	-1,584	,365	2,399	,717
KDOCS_TOT	42	1,90	4,86	3,5576	,75195	-,449	,365	-,442	,717
SELF_EVERYDAY	42	2,00	5,00	4,0238	,63273	-,753	,365	1,072	,717
SCHOLARLY	42	1,00	5,00	3,8485	,87374	-1,128	,365	1,568	,717
PERFORMANCE	42	1,10	5,00	3,1214	1,06600	-,108	,365	-,936	,717
MECH-SCIENT	42	1,00	5,00	3,4841	1,24403	-,692	,365	-,868	,717
ARTISTIC	42	1,00	5,00	3,1905	1,05074	-,167	,365	-,426	,717



Pearson test was used to calculate the correlation between ENTRECOM-TOT and K-DOCS dimensions. There is a high and moderate correlation between ENTRECOM and K-DOCS dimensions, as well as very significant. Correlation values range from .391 to .516 (Table 74).

*Table 74: ENTRECOM & K-DOCS Dimensions Correlation - Turkish Graduate participants*

Dimensions		ENTRECOM _TOT	SELF_EV ERYDAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,511**	,425**	,485**	,516**	,391*
	Sig.	,001	,005	,001	,000	,011	,001
	N	42	42	42	42	42	42
SELF_EVERYDAY	Pearson r	,511**	1	,540**	,243	,341*	,293**
	Sig.	,001		,000	,120	,027	,060
	N	42	42	42	42	42	42
SCHOLARLY	Pearson r	,425**	,540**	1	,416**	,448**	,515**
	Sig.	,005	,000		,006	,003	,000
	N	42	42	42	42	42	42
PERFORMANCE	Pearson r	,485**	,243	,416**	1	,684**	,737**
	Sig.	,001	,120	,006		,000	,000
	N	42	42	42	42	42	42
MECH-SCIENT	Pearson r	,516**	,341*	,448**	,684**	1	,742**
	Sig.	,000	,027	,003	,000		,000
	N	42	42	42	42	42	42
ARTISTIC	Pearson r	,391*	,293**	,515**	,737**	,742**	1
	Sig.)	,011	,060	,000	,000	,000	
	N	42	42	42	42	42	42

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

\*Correlation is significant at the 0.05 level (2-tailed).

#### 2.6.3.4. Variations in entrepreneurship and creativity as a function of school level

Table 75 shows the descriptive statistics of school level variable.

*Table 75: Descriptive statistics of ENTRECOM\*K-DOCS as a function of educational level*

Dimensions		N	Mean	Std. Deviation
ENTRECOM_TOT	High School	16	3,4208	,77773
	Undergraduate	691	3,6968	,54172
	Graduate	42	3,9587	,94280
	Total	749	3,7056	,58048

KDOCS_TOT	High School	16	3,3938	,50642
	Undergraduate	691	3,3522	,60211
	Graduate	42	3,5576	,75195
	Total	749	3,3646	,61059
SELF EVERYDAY	High School	16	3,7102	,56160
	Undergraduate	691	3,8137	,55222
	Graduate	42	4,0238	,63273
	Total	749	3,8233	,55874
SCHOLARLY	High School	16	3,5057	,63763
	Undergraduate	691	3,4294	,69995
	Graduate	42	3,8485	,87374
	Total	749	3,4545	,71505
PERFORMANCE	High School	16	3,0625	,76757
	Undergraduate	691	3,0670	,93105
	Graduate	42	3,1214	1,06600
	Total	749	3,0700	,93482
MECH-SCIENT	High School	16	3,0903	1,02658
	Undergraduate	691	2,9733	1,09360
	Graduate	42	3,4841	1,24403
	Total	749	3,0045	1,10597
ARTISTIC	High School	16	3,5417	,75236
	Undergraduate	691	3,3898	,85801
	Graduate	42	3,1905	1,05074
	Total	749	3,3818	,86811

To test for differences in entrepreneurship and creativity (including its five dimensions) at the high school, undergraduate and graduate educational levels, the non-parametric Independent-Samples Kruskal-Wallis Test was applied. The test results were shown in Table 76 below.

According to the Kruskal-Wallis Test results, there are statistically significant differences between educational levels groups in ENTRECOM, Every day, Scholarly, and Mechanical/Scientific creativity sub-dimensions. On the other hand, there is no statistically significant difference between educational levels in K-DOCS and other sub-dimensions of creativity.

Table 76: Kruskal-Wallis statistics for testing differences in ENTRECOM & K-DOCS as a function of educational levels

<b>Test Statistics<sup>a,b</sup></b>							
	ENTRECOM _TOT	KDOCS_ TOT	SELF_EVERY DAY	SCHOLARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
Chi-Square	20,447	4,855	5,998	15,136	,161	8,187	1,915
df	2	2	2	2	2	2	2
Asymp. Sig.	,000	,088	,050	,001	,923	,017	,384

a. Kruskal Wallis Test

b. Grouping Variable: Education level

Mann-Whitney U test, a nonparametric test, was applied to reveal statistically significant differences between ENTRECOM, Self-Everyday, Scholarly, and Mechanical-Scientific creativity educational levels groups. The comparisons between the three educational levels in Table 77 show that there are not any significant differences in entrepreneurship and creativity between high school and undergraduate groups. Mann-Whitney U tests revealed significant differences between high school and graduate levels as well as between undergraduate and graduate levels in some dimensions.

According to the Mann-Whitney U test results, there is a significant difference between high school and graduate students in terms of entrepreneurship. When we look at the averages of both groups (high school= 3.42, graduate= 3.96), it is seen that graduate students have higher entrepreneurship scores. On the other hand, no significant difference was found between Self-Everyday, Scholarly, and Mechanical/Scientific creativity, which are the sub-dimensions of creativity, between high school and graduate students. In addition, there is a significant difference between undergraduate and graduate students in terms of entrepreneurship. When we look at the averages of both groups (undergraduate = 3.70, graduate= 3.96), it is seen that graduate students have higher entrepreneurship scores. In addition, a significant difference was found between the sub-dimensions of creativity, Self-Everyday, Scholarly, and Mechanical/Scientific creativity, between undergraduate and graduate students. When we look at the scores of the students in these sub-dimensions of creativity, the scores of graduate students are higher than the scores of undergraduate students. This shows that when students reach the graduate level, their creativity increases. These results mean, as expected, that the higher the educational level, the higher the perception of entrepreneurship competence since the highest scores were found for the graduate study cycle.

*Table 77: Mann-Whitney U test to find the difference between groups in education levels*

<b>High School * Undergraduate</b>				
	ENTRECOM_ TOT	SELF_ EVERYDAY	SCHOLARLY	MECH-SCIENT
Mann-Whitney U	4399,000	5278,500	5017,500	5213,500
Wilcoxon W	4535,000	5414,500	244103,500	244299,500
Z	-1,400	-,309	-,633	-,390
Asymp. Sig. (2-tailed)	,162	,757	,527	,697
<b>High School * Graduate</b>				
	ENTRECOM_ TOT	SELF_ EVERYDAY	SCHOLARLY	MECH-SCIENT
Mann-Whitney U	178,500	241,000	236,500	269,500
Wilcoxon W	314,500	377,000	372,500	405,500
Z	-2,743	-1,657	-1,734	-1,158
Asymp. Sig. (2-tailed)	,006	,097	,083	,247
<b>Undergraduate * Graduate</b>				
	ENTRECOM_ TOT	SELF_ EVERYDAY	SCHOLARLY	MECH-SCIENT
Mann-Whitney U	8797,000	11302,500	9382,500	10718,000
Wilcoxon W	247883,000	250388,500	248468,500	249804,000
Z	-4,294	-2,412	-3,853	-2,848
Asymp. Sig. (2-tailed)	,000	,016	,000	,004

## 2.7. Analysis of United Kingdom results (N=92)

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### 2.7.1. Scales reliability analysis of K-DOCS and ENTRECOM (N=92)

UK results returned reliability regarding the total samples (N: 92) and of the fifty K-DOCS items of .94 (Cronbach's Alpha), which is considered excellent. As to K-DOCS dimensions' reliability, values varied as follows in Table 78, which are all considered good or excellent.

*Table 78: Cronbach's Alpha*

K-DOCS DIMENSIONS	UNITED KINGDOM VALUES
1 – Everyday	.823 (items 1-11)
2 – Scholarly	.830 (items 12-22)
3 – Performance	.920 (items 23-32)
4 – Mechanical/Scientific	.940 (items 33-41)
5 – Artistic	.881 (items 42-50)

Concerning ENTRECOM, global Cronbach's Alpha of UK results was .887, which is a good and reliable indicator. As to the items' reliability, they varied between .874 to .887, meaning that no item showed to be problematic.

### 2.7.2. Descriptive analysis

Of the 92 Italian participants declared to be “female” 55 (59.8%), and “males” 37 (40.2%). Regarding age, the UK group starts from 16 and goes until 21, as shown in Table 79.

*Table 79: Age Groups: UK descriptive statistics*

Age Group	Frequency	Percent
16 age	1	1,1
18 age	8	8,7
19 age	10	10,9
20 age	12	13,0
21 age	13	14,1

Considering the educational level, the categories frequency distributions were: 13 (14.1%) for High School; 49 (53.3%) for undergraduate level; and 30 (32.6%) for graduate.

Referring to K-DOCS, Table 80 shows the descriptive results for the UK participants in the survey. The higher mean refers to the “Self-Everyday Dimension” of self-perceived creativity (3.86) and the lower to “MECH-SCIENT” (3.02), while being all scores, of the given sample, above the midpoint of the response scale of 2.5.

*Table 80: K-DOCS UK Descriptive Results*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Stat.	Std. Error
KDOCS_TOT	92	2,30	4,78	3,5083	,59136	,59136	,004	,251	-,513
SELF_EVERYDAY	92	2,64	5,00	3,8567	,56848	,56848	,043	,251	-,545
SCHOLARLY	92	1,91	5,00	3,6196	,60301	,60301	-,284	,251	,528
PERFORMANCE	92	1,20	5,00	3,3207	1,02137	1,02137	-,162	,251	-,979
KDOCS_MECHL_SCIENTIF_TOT	92	1,00	5,00	3,0169	1,13239	1,13239	,030	,251	-1,063
ARTISTIC	92	1,00	5,00	3,6461	,87037	,87037	-,585	,251	,134

Referring to ENTRECOM, UK values are presented in Table 81 underlining a mean of 3.8, also above the midpoint of the response scale of 2.5 and even closer to the top value of 5.

*Table 81: ENTRECOM UK descriptive statistics*

Dimensions	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
						Stat.	Std. Error	Statistic	Std. Error
ENTRECOM_TOT	92	2.13	5.00	4.0522	.48878	-.403	.251	1.717	.498

### 2.7.3. Inferential analysis

#### 2.7.3.1. Age, entrepreneurship and creativity

Age could be considered a very interesting variable for understanding entrepreneurship and creativity competencies. In this regard, applying the non-parametric Spearman’s rho test, Table 82 shows negative and significant correlations between age and K-DOCS scholarly and K-DOCS total (which is in line with the literature). Correlation with age and ENTRECOM score doesn’t report any significant results.

*Table 82: Age\*K-DOCS Correlations – UK overall results*

Dimensions		Age	ENTREC	KDOCS	SELF_EV	SCHOLA	PERFOR	MECH-		
			OM_TOT	_TOT	ERYDAY	RLY	MANCE	SCIENT	ARTISTIC	
Spearman	Age	Corrl.Coeff.	1,000	-,018	-,216*	-,132	-,268**	-,014	-,147	1,000
		Sig.	.	,866	,039	,209	,010	,897	,163	.
		N	92	92	92	92	92	92	92	92

\*Correlation is significant at the 0.05 level (2-tailed).

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

*2.7.3.2. Gender, entrepreneurship and creativity (N: 92)*

Gender has also been considered an important variable to study entrepreneurship and creativity. Independent t-Test revealed gender significant differences regarding one K-DOCS creativity dimension (Table 83), namely Artistic ( $t=2.048$ ,  $p=.043$ ), favouring female (mean=3.89) compared to women (mean=3.42). These results deserve consideration and broad study to understand the meaning behind such gender differences. As to ENTRECOMP scale, the statistics show no significant differences.

*Table 83: T-test for K-DOCS Gender Differences– UK overall results*

		Levene's Test for Equality of Variances			t-test for Equality of Means					
		Z	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Dimensions									Lower	Upper
ENTRECOM_TOT	Eq.var.ass.	3,947	,050	,780	90	,437	,08124	,10415	-,12567	,28816
	Eq.var~ass			,727	58,783	,470	,08124	,11172	-,14233	,30482
KDOCS_TOT	Eq.var.ass.	,146	,703	,878	90	,382	,11057	,12590	-,13955	,36068
SELF EVERY DAY	Eq.var.ass.	2,384	,126	1,425	90	,158	,17132	,12019	-,06747	,41011
SCHOLARLY	Eq.var.ass.	3,403	,068	,934	90	,353	,11986	,12830	-,13504	,37476
PERFORMANCE	Eq.var.ass.	,332	,566	1,076	90	,285	,23346	,21698	-,19760	,66453
MECH-SCIENT	Eq.var.ass.	6,230	,014	-1,564	90	,121	-,37357	,23888	-,84816	,10101
	Eq.var~ass			-1,647	88,455	,103	-,37357	,22679	-,82424	,07709
ARTISTIC	Eq.var.ass.	,683	,411	2,048	90	,043	,37254	,18190	,01117	,73390

*2.7.3.3. Correlations between entrepreneurship and creativity*

*2.7.3.3.1. Correlations for the overall sample (N=92)*

Concerning the global score correlation between entrepreneurship (ENTRECOM) and creativity (K-DOCS) competencies of young people, from High School to University, the “r of Pearson” test indicated a value of  $r=.265$  ( $p=.011$ ), meaning a positive significant yet small correlation.

Regarding the correlations of ENTRECOMP with K-DOCS dimensions, displayed in Table 84, all are positive and significant, with Self-everyday (.503) moderately correlated and Scholarly (.337) showing a small correlation.

*Table 84: ENTRECOM & K-DOCS Correlations – UK results: overall and by dimension*

Dimensions		ENTRECOM _TOT	SELF_EVERY DAY	SCHO LARLY	PERFOR MANCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,503**	,337**	,093	,117	,041
	Sig.		,000	,001	,378	,266	,699
	N	92	92	92	92	92	92
SELF_EVERYDAY	Pearson r	,503**	1	,545**	,367**	,213*	,346**
	Sig.	,000		,000	,000	,042	,001
	N	92	92	92	92	92	92
SCHOLARLY	Pearson r	,337**	,545**	1	,399**	,283**	,365**
	Sig.	,001	,000		,000	,006	,000
	N	92	92	92	92	92	92
PERFORMANCE	Pearson r	,093	,367**	,399**	1	,499**	,518**
	Sig.	,378	,000	,000		,000	,000
	N	92	92	92	92	92	92
MECH-SCIENT	Pearson r	,117	,213*	,283**	,499**	1	,323**
	Sig.	,266	,042	,006	,000		,002
	N	92	92	92	92	92	92
ARTISTIC	Pearson r	,041	,346**	,365**	,518**	,323**	1
	Sig.	,699	,001	,000	,000	,002	
	N	1	,503**	,337**	,093	,117	,041

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

#### 2.7.3.3.2. Correlations for the high-school sample (N=13)

Regarding the correlations between ENTRECOMP and K-DOCS for high school, displayed in Table 85, we found a global positive significant correlation between ENTRECOM and K-DOCS (.612, p=.026), as also between ENTRECOM-TOT and the K-DOCS dimension of Self-everyday (.648, p=.017).

*Table 85: ETRECOM & K-DOCS Correlations – UK High-school participants*

Dimensions		ENTRECOM _TOT	SELF_EVE RYDAY	SCHOLARL Y	PERFORMA NCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,648*	,322	,380	,281	,423
	Sig.		,017	,284	,201	,352	,149
	N	13	13	13	13	13	13
SELF_EVERYDAY	Pearson r	,648*	1	,673*	,410	,074	,215
	Sig.	,017		,012	,164	,811	,481
	N	13	13	13	13	13	13
SCHOLARLY	Pearson r	,322	,673*	1	,486	,180	,078
	Sig.	,284	,012		,092	,556	,801
	N	13	13	13	13	13	13



PERFORMANCE	Pearson r	,380	,410	,486	1	,254	,338
	Sig.	,201	,164	,092		,402	,259
	N	13	13	13	13	13	13
MECH-SCIENT	Pearson r	,281	,074	,180	,254	1	,221
	Sig.	,352	,811	,556	,402		,467
	N	13	13	13	13	13	13
ARTISTIC	Pearson r	,423	,215	,078	,338	,221	1
	Sig.	,149	,481	,801	,259	,467	
	N	13	13	13	13	13	13

\* Correlation is significant at the 0.05 level (2-tailed).

#### 2.7.3.3.3. Correlations for the undergraduate sample (N=49)

Regarding the undergraduate level, we found a positive and significant correlation between ENTRECOM-TOT and dimensions of Self-everyday (.457,  $p=.001$ ) and with Scholarly (.364,  $p=.001$ ), as displayed in Table 86.

Table 86: ETRECOM & K-DOCS Correlations – UK Undergraduate participants

Dimensions		ENTRECOM	SELF EVERY	PERFOR			
		_TOT	DAY	SCHOLARLY	MANCE	MECH-SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,457**	,364*	,001	-,043	,005
	Sig.		,001	,010	,995	,771	,974
	N	49	49	49	49	49	49
SELF EVERYDAY	Pearson r	,457**	1	,582**	,245	,202	,363*
	Sig.)	,001		,000	,090	,164	,010
	N	49	49	49	49	49	49
SCHOLARLY	Pearson r	,364*	,582**	1	,398**	,191	,450**
	Sig.	,010	,000		,005	,188	,001
	N	49	49	49	49	49	49
PERFORMANCE	Pearson r	,001	,245	,398**	1	,701**	,608**
	Sig.	,995	,090	,005		,000	,000
	N	49	49	49	49	49	49
MECH-SCIENT	Pearson r	-,043	,202	,191	,701**	1	,429**
	Sig.	,771	,164	,188	,000		,002
	N	49	49	49	49	49	49
ARTISTIC	Pearson r	,005	,363*	,450**	,608**	,429**	1
	Sig.	,974	,010	,001	,000	,002	
	N	49	49	49	49	49	49

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

\*Correlation is significant at the 0.05 level (2-tailed).

2.7.3.3.4. Correlations for the graduate sample (N=30)

Concerning the graduate level, we found (Table 87) two positive significant correlations, namely between ENTRECOM-TOT and K-DOCS dimensions of Self-everyday (.512, p=.004) and MECH-SCIENT (.392, p=.032).

*Table 87: ENTRECOM & K-DOCS Correlations – UK Graduate participants*

Dimensions		ENTRECO M_TOT	SELF_EVE RYDAY	SCHOLARL Y	PERFORMA NCE	MECH- SCIENT	ARTISTIC
ENTRECOM_TOT	Pearson r	1	,512**	,324	,177	,392*	-,118
	Sig.		,004	,081	,351	,032	,533
	N	30	30	30	30	30	30
SELF_EVERYDAY	Pearson r	,512**	1	,491**	,584**	,464**	,328
	Sig.)	,004		,006	,001	,010	,077
	N	30	30	30	30	30	30
SCHOLARLY	Pearson r	,324	,491**	1	,404*	,462*	,381*
	Sig. (2-tailed)	,081	,006		,027	,010	,038
	N	30	30	30	30	30	30
PERFORMANCE	Pearson r	,177	,584**	,404*	1	,331	,458*
	Sig.	,351	,001	,027		,074	,011
	N	30	30	30	30	30	30
MECH-SCIENT	Pearson r	,392*	,464**	,462*	,331	1	,232
	Sig.	,032	,010	,010	,074		,218
	N	30	30	30	30	30	30
ARTISTIC	Pearson r	-,118	,328	,381*	,458*	,232	1
	Sig.	,533	,077	,038	,011	,218	
	N	30	30	30	30	30	30

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

\*Correlation is significant at the 0.05 level (2-tailed).

2.7.3.4. Variations in entrepreneurship and creativity as a function of school level

Table 88 presents the descriptive statistics for ENTRECOM and K-DOCKS, and their dimensions, regarding educational level.

*Table 88: Descriptive statistics of ENTRECOM & K-DOCS as a function of educational level*

Dimensions		N	Mean	Std. Dev.
ENTRECOM_TOT	High School	13	4,1333	,48838
	Undergraduate	49	3,9932	,50849
	Graduate	30	4,1133	,45860
	Total	92	4,0522	,48878

KDOCS_TOT	High School	13	3,5985	,51578
	Undergraduate	49	3,4943	,62262
	Graduate	30	3,4920	,58429
	Total	92	3,5083	,59136
SELF_EVERYDAY	High School	13	4,1608	,64299
	Undergraduate	49	3,7811	,58943
	Graduate	30	3,8485	,46559
	Total	92	3,8567	,56848
SCHOLARLY	High School	13	3,5804	,68488
	Undergraduate	49	3,6308	,57448
	Graduate	30	3,6182	,63228
	Total	92	3,6196	,60301
PERFORMANCE	High School	13	3,6615	,82415
	Undergraduate	49	3,3551	1,03804
	Graduate	30	3,1167	1,05441
	Total	92	3,3207	1,02137
MECH-SCIENT	High School	13	2,6239	1,02994
	Undergraduate	49	3,0975	1,14948
	Graduate	30	3,0556	1,14721
	Total	92	3,0169	1,13239
ARTISTIC	High School	13	3,8376	,79688
	Undergraduate	49	3,5283	,92977
	Graduate	30	3,7556	,79451
	Total	92	3,6461	,87037

Testing the differences for entrepreneurship and creativity (in its five dimensions) by all educational levels (oneway ANOVA), no significant differences were found (Table 89).

*Table 89: ANOVA statistics for testing differences in ENTRECOM & K-DOCS as a function of educational levels*

Dimensions		Sum of Squares	df	Mean Square	F	p
ENTRECOM_TOT	Bet. Groups	,368	2	,184	,767	,468
	With. Groups	21,372	89	,240		
	Total	21,741	91			
KDOCS_TOT	Bet. Groups	,123	2	,062	,173	,841
	With. Groups	31,700	89	,356		
	Total	31,823	91			

SELF EVERYDAY	Bet. Groups	1,485	2	,742	2,366	,100
	With. Groups	27,924	89	,314		
	Total	29,409	91			
SCHOLARLY	Bet. Groups	,026	2	,013	,035	,965
	With. Groups	33,064	89	,372		
	Total	33,090	91			
PERFORMANCE	Bet. Groups	2,817	2	1,409	1,361	,262
	With. Groups	92,114	89	1,035		
	Total	94,931	91			
MECH-SCIENT	Bet. Groups	2,371	2	1,185	,923	,401
	With. Groups	114,319	89	1,284		
	Total	116,690	91			
ARTISTIC	Bet. Groups	1,516	2	,758	1,000	,372
	With. Groups	67,421	89	,758		
	Total	68,937	91			

## ***Conclusion***

The declared basic objective of the Project “Beyond the Limits: Developing Entrepreneurship via Creativity in Schools” was “Innovation”. Still, a subsidiary and more focused objective on the competencies to be studied and developed, namely Creativity and Entrepreneurship, was also stated: to carry out a SWOT needs analysis concerning creativity and entrepreneurship competencies levels of students from University (undergraduates and graduates). High School level was also sought as being an indicator of a cohort that may, or may not, enter higher education, and eventually give a sign of its eventual or lesser adaptation, in terms of creativity and entrepreneurship competencies. Now, from a preliminary study, distributed and discussed among the partners, it resulted that an investigation process configured according to essential scientific requirements should be carried out, as it was above described. Which maintained the original purpose. In this conclusion we intend to present a summary and reflection about the main results obtained. However, we would like to stress, first of all, that the results and conclusions of this investigation must be considered with caution, because of some limitations that affected it; something, in fact, intrinsic to all studies, with some being more limited than others (Brutus, 2013; Ioannidis, 2007; Pasek, 2012).

We acknowledge that the results and correspondent conclusions of the present study are limited, firstly because the samples were obtained by convenience and on a casuistic basis. In addition, some are too small to allow the application of tests and, in certain cases, it is recorded that one or more groups have zero or close to zero subjects. This was due to the interest in studying the institutions of the Project’s participants, but also to the fact that it was very difficult to expand the application of data collection instruments to other institutions, due to ethical, formal authorizations and logistical issues. These are, therefore, limitations related to the focus, the temporal conditions and the means available to carry out the study in more representative terms. Investigations with more ambitious objectives –let alone more substantial mean– will have to consider the possibilities of covering national territories, without forgetting to contemplate the strata involved, according to what their parameters dictate. In our case, it is difficult to accept that the samples are even representative of our institutions, which limits the possibility of grounding relationships and generalizations. As the questionnaires were self-administered via electronic means we couldn’t control the conditions by which the data were collected, meaning that reliability issues are not excluded. Namely for the case where results contradict any emergent general tendency.

Secondly, we have to account for the study relying on self-reported data, with simple face value, which can be biased by selective memory, the telescopic effect, the attribution of positive results to the self-agency and negative to external forces, as well as by exaggeration or social desirability. To mention a few.

Thirdly, we must refer that the instruments used also derivate limitations for the study. In the case of the “ENTRECOM QUESTIONNAIRE - ON ENTREPRENEURSHIP PERCEPTION” it should be recalled that it was built by this team of researchers based on the “EntreComp: The Entrepreneurship Competence Framework” (2016), considering the 15 items of the “intermediate” level of proficiency while applying a five-point Likert scale. It was then translated into five languages but only one country, Portugal, undertook a quantitative and qualitative reliability pilot study that reported fair to good results. Better information can be given regarding the “Kaufman Domains of Creativity Scale (K-DOCS) (Kaufman, 2012), which was already been validated by several studies, in addition to being an object of retroversion and back translation processes, with the help of English native speaking experts.

Nevertheless, as discussed above, the research team was concerned with finding adequate instruments, for obtaining valid data about Entrepreneurship and Creativity, for all countries. Thus, previously to the main data analysis, the reliability of the two instruments (ENTRECOMP and K-DOCS) was verified for all countries' samples and we found, in general, good or excellent levels of items consistency (Cronbach alpha), ranging from .79 to .95, for K-DOCS, and from .86 to .90, regarding ENTRECOMP, and this is an important positive research data concerning measuring instruments. In what follows we will make country comparisons from the obtained results.

Regarding Entrepreneurship, the mean values of the countries in the study are similar, ranging between 3.70 and 4.10, meaning that all countries present values above the midpoint of the response scale. Concerning the mean value of each country, from the lower to the highest, we found the following results: 3.70 (Latvia), 3.71 (Turkey), 3.79 Italy, 3.81 (Portugal), 3.89 (Spain), 4.05 (United Kingdom) and 4.1 (Romania). Although these means assume different values, they may not be regarded as pointing to expressive differences between the countries. As, on one hand, they are close (the difference between the higher and the lower is only .40, and, on another hand, we have to stress that they come from very different countries' sample sizes. For instance, the United Kingdom presents an N of 92, while Portugal obtains 865. The other countries N correspond to Latvia (179); Spain (255); Romania (489); Italy (524); and Turkey (749).

Considering Creativity, the countries' mean values are even closer, ranging between 3.21 and 3.51, though slightly lower than those of Entrepreneurship. As to the mean value of each country, from the lower to the highest, we found the following results: 3.21 (Italy), 3.34 (Portugal), 3.37 (Turkey), 3.42 (Romania), 3.43 (Latvia), 3.47 (Spain) and 3.51 (United Kingdom). Although these means assume different values, they may not also be regarded as pointing to expressive differences between the countries. The difference between the higher and the lower is only .31. In the two cases of Entrepreneurship and Creativity, means above the cutoff point of 2.5 seem to indicate a positive performance perception of the respondents. However, about Entrepreneurship, it should be noted that the base level of measurement corresponds to the intermediate level of the reference instrument. Indicating that even the highest score would be limited to the preferred level.

Regarding Creativity dimensions, when comparing the values from the seven countries, the data shows that the three dimensions with the highest values are Self-Everyday, Artistic and Scholarly. However, it is striking that the Self-Everyday dimension appears as the highest mean for all countries. Moreover, Artistic appears as the second higher score in Italy, Spain and UK. On the other hand, Scholarly appears in the same position for Portugal, Romania and Turkey. The dimensions with lower scores in all the countries are Mechanical-Scientific and Performance. Except for Latvia, where Artistic and Scholarly also have lower scores.

An important aspect that caught our interest was understanding the correlations between Entrepreneurship and Creativity, by country, as an indicator of the relation between the two competencies, the Project aims to develop. In this respect, the coefficient's higher value was .556 for Italy, and the lowest was .214 for Latvia. As to the values of each country, from the lower to the highest, we found the following results: .214 (Latvia), .448 (Turkey), .469 (Spain), .478 (Portugal), .503 (UK), .536 (Romania), and .556 (Italy). These results point to a substantial difference between the lower and the highest correlations, although there aren't sufficient data to interpret rigorously these results due to the small sample sizes of some countries, namely Latvia and the UK. Nevertheless, except for Latvia, we can see that the countries present consistently medium-high global correlations between Entrepreneurship and Creativity, meaning that these two constructs are effectively associated or, in other words, the more entrepreneurs the students perceive themselves, the more creative they also tend to see themselves.

Searching by country, the Creativity dimensions that correlate more strongly with Entrepreneurship are the following: Italy (Scholarly); Latvia (Self-Everyday and Scholarly); Portugal (Self-Everyday and Scholarly); Romania (Scholarly and Self-Everyday); Spain (Self-

Everyday and Scholarly; Turkey (Self-Everyday and Scholarly); and the UK (Scholarly and Self-Everyday). Meaning that, interestingly, the Entrepreneurship construct appears consistently related to the referred dimensions, for all countries. While, the Mechanical/Scientific and Performance dimensions seem not to be so related to Entrepreneurship, which suggests that these dimensions should be more developed within the curricular activities.

As to gender, we found no significant differences regarding ENTRECOM and K-DOCS as general constructs, for all countries. However, when it comes to K-DOCS dimensions, results present a noteworthy variation. Only Latvian and UK respondents show no significant differences between genders regarding Mechanical-Scientific creativity competence, although the UK presents significant differences favouring females in the Artistic dimension (3.79 vs. 3.42). On their side, the Romanian results show no significant differences for the Artistic dimension between genders, although we register significant differences for Mechanical-Scientific favouring males (3.17 vs. 2.66). For the remaining four countries, a tendency emerges of significant differences that favour males in the Mechanical-Scientific dimension and females in the Artistic dimension, respectively: Italy (2.84 vs. 2.47; 3.51 vs. 3.00), Portugal (3.19 vs. 2.70; 3.46 vs. 3.18), Spain (3.1 vs. 2.79; 3.69 vs. 3.34), UK (3.80 vs. 3.42). And must be noted that Turkey is the only case where females outperform males significantly (3.23 vs. 2.89) in the Mechanical-Scientific dimension, while in reverse males outperform females in the Artistic dimension (3.48 vs. 3.17).

This study, limitations aside, gave us a base to make some recommendations, both for theory and practice. As to the research requirements, we have to suggest future endeavours look for validating translations and/or adaptations of the two instruments. Is also very crucial widening the samples in order to grant representativity and the correspondent inference possibility. A unifying question of the purpose of the study carried out refers to where to direct efforts to develop entrepreneurship and creativity competencies. Although the mean levels reported for Entrepreneurship and Creativity are, for all countries, above 3.20, reaching the highest levels of 3.51 for Creativity and 4.10 for Entrepreneurship, it stands out that there is a, so to speak, “underperformance” in Creativity compared with Entrepreneurship. The entrepreneurship global mean, measured by ENTRECOMP, is 3.82, while 3.35 for Creativity, measured by K-DOCS. As the former competence seems to be conditional to the latter, one should be prone to suggest an investment priority in Creativity, particularly Mechanical/Scientific and Performance dimensions, while being aware that the performance in Entrepreneurship is already the highest. Nevertheless, each country must consider its values per se. Again, the size and heterogenic nature of the samples suggest being cautious in this respect.



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Annexes, Appendixes and Excursus



Annexe 1

**Inventory of Creative Activities and Achievements (ICAA)**

(English version)

Reference: Diedrich, J., Junk, H., Silvia, P.J., Gredlein, J.M., Neubauer, A.C., & Benedek, M. (2018). Assessment of real-life creativity: The Inventory of Creative Activities and Achievements (ICAA). *Psychology of Aesthetics, Creativity, and the Arts*, 12, 304-316. doi: 10.1037/aca0000137

**General Instructions:**

This inventory asks you to report your creative activities and achievements. The inventory contains eight different domains (e.g., literature, music, and performing arts). You will be asked three questions for each of these domains.

**Here is an example:**

*Question 1:*

Specify how many times you have carried out a certain activity over the last 10 years.

Example: If you already invented your own magic trick four times, but never invented your own circus program, mark the boxes as follows:

	Never	1-2 times	3-5 times	6-10 times	More than 10 times
Made up a circus program	✗				
Invented a magic trick			✗		

*Question 2:*

In question 2, please specify the level of achievement you have attained in the particular field. You are given the same eleven choices in every domain. Please check all statements that describe your level of achievement in the whole field.

Example: If you already invented magic tricks, then you already tried this domain and produced your own original work. If you already showed them to friends but not yet to strangers, please mark the boxes as follows:

- 0. I have never been engaged in this domain
- 1. I have tried this domain once.
- 2. I have already created at least one original work in this domain.
- 3. I have shown my original work in this domain to some friends.
- 4. I have shown my original work in this domain to strangers.

Annexe 2

Ref. Ares(2015)2182115 - 26/05/2015

**The Budapest Agenda:**  
**Enabling Teachers for Entrepreneurship Education**

The aim of the 'Budapest Agenda' is to provide a catalogue of measures to be drawn upon by stakeholders at all levels within the worlds of education, business and the wider community in order to take forward the development of teacher education in entrepreneurship. It draws on the work and experiences of practitioners and policy makers from across Europe, EU partner countries from the EU pre-accession and Mediterranean neighbourhood regions, and is backed up by good practices, as evidenced by this report. It is intended to be used by all those with an interest in the subject, who can select measures and tailor them to their own particular circumstances. Each action indicates the relevant actors.

	EU	Member States	Educational Authorities	Regional/local Authorities	Schools	Intermediary Organisations <sup>1</sup>	Business Enterprises	Teacher Education Institutions
<b>Initial Teacher Education</b>								
<b>A1 Entrepreneurship education for all</b>								
Make entrepreneurship modules <b>compulsory</b> for student teachers		✓	✓	✓				✓
<b>A2 Curriculum content and pedagogy</b>								
Use the same <b>practical methods</b> that teachers will use with their students (active learning, practical experiences)	✓	✓	✓	✓	✓	✓	✓	✓
Ensure <b>continuity</b> between teacher education and student teachers' first experiences in host schools		✓	✓	✓	✓			✓
Have access to <b>authentic tasks</b> , by creating links to the local community (business, local authorities, third sector) to identify and get access to real life tasks that the teachers can use		✓	✓	✓	✓	✓	✓	✓
Promote <b>internships and placements</b> of teachers in enterprises, or allow teachers to shadow an entrepreneur for one day	✓	✓	✓	✓	✓	✓	✓	✓
<b>A3 Assessment</b>								
Develop and implement methods that enable assessment of the <b>transversal skills and attitudes</b> of the entrepreneurship key competence	✓	✓	✓	✓				✓
<b>A4 Selection of student teachers</b>								
Consider <b>entrepreneurial skills</b> and experiences as one possible asset when selecting student teachers, and help those students to draw on these skills and experiences to inform their teaching		✓						✓

<sup>1</sup> Intermediary organisations are those organisations and business associations that play the role of building links between education and the business world, and/or that of running/mentoring/coaching entrepreneurship education programmes and activities.

Annexe 3

**Appendix: The full EntreComp framework**

			Level of proficiency	Foundation		Intermediate		Advanced		Expert		
			Progression	Relying on support from others		Building independence		Taking responsibility		Driving transformation, innovation and growth		
				Under direct supervision.	With reduced support from others, some autonomy and together with my peers.	On my own and together with my peers.	Taking and sharing some responsibilities.	With some guidance and together with others.	Taking responsibility for making decisions and working with others.	Taking responsibility for contributing to complex developments in a specific field.	Contributing substantially to the development of a specific field.	
				Discover	Explore	Experiment	Done	Improve	Reinforce	Expand	Transform	
Area	Competence	Hint	Descriptor	Thread <sup>16</sup>	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8
Ideas and opportunities	Spotting opportunities	Use your imagination and abilities to identify opportunities for creating value. Establish new connections and bring together scattered elements of the landscape to create opportunities to create value.	Identify and seize opportunities to create value by exploring the social, cultural and economic landscape. Identify needs and challenges that need to be met.	Identify, create and seize opportunities.	I can find opportunities to help others.	I can recognise opportunities to create value in my community and surroundings.	I can explain what makes an opportunity to create value.	I can proactively look for opportunities to create value, including out of necessity.	I can describe different analytical approaches to identify entrepreneurial opportunities.	I can use my knowledge and understanding of the context to make opportunities to create value.	I can judge opportunities for creating value and decide whether to follow these up at different levels of the system I am working in (for example, micro, meso or macro).	I can spot and quickly take advantage of an opportunity.
			Focus on challenges.	I can find different examples of challenges that need solutions.	I can recognise challenges in my community and surroundings that I can contribute to solving.	I can identify opportunities to solve problems in alternative ways.	I can redefine the description of a challenge, so that alternative opportunities address it may become apparent.	I can take apart established practices and challenge mainstream thought to create opportunities and look at challenges in different ways.	I can judge the right time to take an opportunity to create value.	I can cluster different opportunities or identify synergies among different opportunities to make the most out of them.	I can define opportunities where I can maintain a competitive advantage.	
			Uncover needs.	I can find examples of groups who have benefited from a solution to a given problem.	I can identify needs in my community and surroundings that have not been met.	I can explain that different groups may have different needs.	I can establish which user group, and which needs, I want to tackle through creating value.	I can carry out a needs analysis involving relevant stakeholders.	I can identify challenges related to the contracting needs and interests of different stakeholders.	I can produce a 'roadmap' which matches the needs with the actions needed to deal with them and helps me create value.		

<sup>16</sup> Threads identify the theme running through out each row of the table.

Annexe 4

**Table 3: EntreComp Overview**

		Levels of proficiency		
Area	Competence	Foundation	Intermediate	Advanced
<b>Ideas and opportunities</b>	<b>Spotting opportunities</b>	Learners <sup>a</sup> can find opportunities to generate value for others.	Learners can recognise opportunities to address needs that have not been met.	Learners can seize and shape opportunities to respond to challenges and create value for others.
	<b>Creativity</b>	Learners can develop multiple ideas that create value for others.	Learners can test and refine ideas that create value for others.	Learners can transform ideas into solutions that create value for others.
	<b>Vision</b>	Learners can imagine a desirable future.	Learners can build an inspiring vision that engages others.	Learners can use their vision to guide strategic decision-making.
	<b>Valuing ideas</b>	Learners can understand and appreciate the value of ideas.	Learners understand that ideas can have different types of value, which can be used in different ways.	Learners can develop strategies to make the most of the value generated by ideas.
	<b>Ethical and sustainable thinking</b>	Learners can recognise the impact of their choices and behaviours, both within the community and the environment.	Learners are driven by ethics and sustainability when making decisions.	Learners act to make sure that their ethical and sustainability goals are met.
<b>Resources</b>	<b>Self-awareness and self-efficacy</b>	Learners trust their own ability to generate value for others.	Learners can make the most of their strengths and weaknesses.	Learners can compensate for their weaknesses by teaming up with others and by further developing their strengths.
	<b>Motivation and perseverance</b>	Learners want to follow their passion and create value for others.	Learners are willing to put effort and resources into following their passion and create value for others.	Learners can stay focused on their passion and keep creating value despite setbacks.

<sup>a</sup> Learner is a broad the term used to indicate the subject of lifelong learning. It refers to pupils, students, jobseekers, employees, entrepreneurs and citizens alike.

Appendix 1

“Workpage ‘Needs Analysis – Sampling – Demographics and Analysis’



# NEEDS ANALYSIS RESEARCH

## ON THE CREATIVITY AND ENTREPRENEURSHIP COMPETENCE FRAMEWORK

# NEEDS ANALYSIS RESEARCH

1. “Through this project, we aim to develop students' and their teachers' creativity and entrepreneurial competences via suited educational activities.”
  - 1.1. students and teachers – as aiming a mindset through an environment
  - 1.2. creativity and entrepreneurial competences
2. Need analysis must be approached by a methodological scientific research
  - 2.1. EU documents and research point to framework and appropriated assessment instruments
    - 2.1.1. Congruent with the objectives
    - 2.1.2. Valid and fitted to the public
    - 2.1.3. Free to apply (KEYS?)
    - 2.1.4. Inexpensive
    - 2.1.5. Length and complexity
  - 2.2. Some instruments need to be developed and validated

## DEFINING CREATIVITY

1. By creative education we mean forms of education that develop young people's capacities for original ideas and action; by cultural education we mean forms of education that enable them to engage positively with the growing complexity and diversity of social values and ways of life. We argue that there are important relationships between creative and cultural education, and significant implications for methods of teaching and assessment, the balance of the school curriculum and for partnerships between schools and the wider world. (Robinson, 1999, 5)
2. creativity could be understood as relying upon a process, pertaining the individual, organizations or even entire societies, to obtain and improve knowledge, know-how, attitudes, equipment and resources, which then endow them to achieve a better "capacity" concerning different realms or a set of systemically integrated realms (Potter & Brought, 2004; Heslop, 2010; James, 2018).
3. an increase in the person's capacity building seems not to be sufficient to cope with the advancement of sustainable development, precisely because it requires the articulation with a supportive institutional and organizational environment, let alone the dwelling with a cultural heritage. The later subject recalls the importance that a proper ambience could have for stimulating creativity of all categories, namely originality of historic level.
4. Besides, creativity is transversal to all human activities. Although usually referred to as the realm of Arts, there is no one doubts about its essential role in science and technology, as well in sports and even everyday life. Its possibilities are pervasive in everyday life, but it is also pervasively stemming out in numerous activities from the individual or collective endeavours.
5. Creative potentialities are present in all persons in an ample array of domains as there are people with exceptional creative gifts
6. "According to the cognitive approach creativity is the result of conscious, deliberate, rational thinking. But reason gets inspired by the unconscious, the irrational, the emotional. Creativity is both the infant of rationalism and irrationalism." (KEA European Affairs, 2009, 167)

## DEFINING CREATIVITY

- “Creativity would be:
  - - a cognitive process which is triggered by motivation and interest in the new and which has no intrinsic link to the ability to score highly in intelligence tests for example
  - - not genetic
  - - usually, the result of long periods of hard work and the acquisition of knowledge, as spontaneity requires a fertile ground
  - - is usually related to a specific field of activity
  - - requires an audience assessment and is subject to cultural constraints (the social process) or subject to industrial constraints (in many of the creative industries).” (KEA European Affairs, 2009, 169)
  - “Imaginative activity fashioned so as to produce outcomes that are both original and of value.” (Robinson, 1999, 30)



# ASSESSING CREATIVITY I: STUDENTS

1. Diedrich et al. (2018) – ICAA a sound approach and validated instrument,
  - 1.2. distinguishes
    - 1.2.1. **Little-C** referring to every-day creativity, when people engage in leisure activities (e.g., embroiding);
    - 1.2.2. **Pro-C** pertaining to the professional level of creativity, which could imply some degree of formal training and expertise (e.g., releasing a music album), along with, perhaps, receiving public acknowledgement from specifically interested audiences; and finally,
    - 1.2.3. **Big-C** that relates to eminent creators accomplishments, the already referred historic creativity, that have a revolutionary impact and accredits deserved prestige along with wide and lasting notoriety.

# ASSESSING CREATIVITY 1: STUDENTS

## 2. Diedrich et al. (2018) – ICAA a sound approach and validated instrument

### 2.1. distinguishes

2.1.1. **Little-C** relies upon the frequency of activity (and not necessarily the public awareness),

2.1.2. while **Pro-C** focus on the quality of the achievement (or level of attainment in one's lifetime), trying to estimate its level within a specific creative domain and considering the public impact

2.2. to measure creative activity and achievement, in balanced coverage of accomplishments across the most relevant creative domains and levels of attainment: literature, music, arts and crafts, creative cooking, sports, visual arts, performing arts, and science and engineering

## ASSESSING CREATIVITY 2: TEACHERS

1. KEYS, which consists in a questionnaire to measure attitudes within an organization towards creativity and creative problem solving (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Amabile, Taylor, & Gryskiewicz, 1995; KEYS, 2016).

1.1. Through teachers proficiency we get the picture of the environment

1.2. Keys (2016) envisages innovation within the organization;

1. Organizational Motivation – the basic orientation of the organization toward innovation; shared vision; providing rewards and recognition; lack of internal politics, and lack of overemphasis on the status quo;

2. Resources – everything the organization has available to aid in the area targeted for innovation, including time, funding, information and materials;

3. Management Practices – allowing freedom and autonomy in the practice of work; providing challenge; specifying clear strategic goals and forming work teams comprised of individuals with diverse skills and perspectives.

And it expects two kind of outcomes:

1. Freedom: Deciding what work to do or how to do it; a sense of control over one's work;

2. Challenging Work: A sense of having to work hard on challenging tasks and important projects.

1.3. KEYS (2016) articulated with ICAA (Diedrich et al., 2018) allow complementarity, while enhancing validity, along with establishing a parallel with what we foresee regarding the measure of entrepreneurship.

## DEFINING ENTREPRENEURSHIP

1. "Entrepreneurship is first and foremost a mindset. It covers an individual's motivation and capacity, independently or within an organization, to identify an opportunity and to pursue it to produce new value or economic success. It takes creativity or innovation [...] To turn an [...] idea into success requires the ability to blend creativity or innovation with sound management and to adapt [...,] to optimise [...] during all phases of [a] life cycle. This goes beyond daily management: it concerns a business' ambitions and strategy" (Commission of the European Communities, 2003, 4).
2. *as "an individuals ability to turn ideas into action. It includes creativity, innovation and risk-taking, as well as the ability to plan and manage projects to achieve objectives. This supports individuals, not only in their everyday lives at home and in society, but also in the workplace in being aware of the context of their work and being able to seize opportunities, and is a foundation for more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance"* (European Parliament and the Council, 2006, 17).

## DEFINING ENTREPRENEURSHIP

1. “Budapest Agenda: Enabling Teachers for Entrepreneurship Education” as reference document:
  - 1.1. Initial Teacher Education (Entrepreneurship education for all; Curriculum content and pedagogy; Assessment; Selection of student Teachers; Partnerships);
  - 1.2. National Support (Strategies; Entrepreneurship education curricula; Assessment of the entrepreneurship key competence Incentives; Resources; Communication; Communities of entrepreneurial Teachers);
  - 1.3. Continuing Professional Development (Curriculum content, pedagogy and assessment; Buy-in and ownership; Businesses and the wider community as a resource; Recruitment and promotion of teachers; Continuing Professional development in national/regional strategies);
  - 1.4. Local School Support (Entrepreneurial school strategies; Entrepreneurial leadership; Resources; Community networks and partnerships).
2. “EntreComp: The Entrepreneurship Competence Framework” (Bacigalupo, Kampylis, Punie & Van den Brande, 2016), “A New Skills Agenda for Europe” in line with the Budapest Agenda
3. the conviction that developing awareness about entrepreneurial **skills, knowledge and attitudes**, which are learnable, can also “widespread the development of entrepreneurial mind-sets and culture, which benefit individuals and society as a whole” (Bacigalupo, Kampylis, Punie & Van den Brande, 2016, 5)
  - 6.1. **entrepreneurship as a competence**
  - 6.2. **transversal competence**
  - 6.3. key competence, of individuals, groups and even organisations, applying to **all spheres of life and**, namely to the private, public and third sectors
  - 6.4. “The EntreComp Framework is made up of 3 competence areas: ‘Ideas and opportunities’, ‘Resources’ and ‘Into action’. Each area includes 5 competences, which, together, are the building blocks of entrepreneurship as a competence. The framework develops the 15 subcompetences along an 8-level progression model [...] which offers inspiration and insight for those designing interventions from different educational contexts and domains of application” (Bacigalupo et al., 2016, 5).

# ASSESSING ENTREPRENEURSHIP 1: STUDENTS

2. Given the complexity of “EntreComp Full” (Bacigalupo, Kampylis, Punie & Van den Brande, 2016) we opt for “EntreComp Overview” – 3 levels

Table 3: EntreComp Overview

Area	Competence	Levels of proficiency		
		Foundation	Intermediate	Advanced
Ideas and opportunities	Spotting opportunities	Learners <sup>8</sup> can find opportunities to generate value for others.	Learners can recognise opportunities to address needs that have not been met.	Learners can seize and shape opportunities to respond to challenges and create value for others.
	Creativity	Learners can develop multiple ideas that create value for others.	Learners can test and refine ideas that create value for others.	Learners can transform ideas into solutions that create value for others.
	Vision	Learners can imagine a desirable future.	Learners can build an inspiring vision that engages others.	Learners can use their vision to guide strategic decision-making.
	Valuing ideas	Learners can understand and appreciate the value of ideas.	Learners understand that ideas can have different types of value, which can be used in different ways.	Learners can develop strategies to make the most of the value generated by ideas.
	Ethical and sustainable thinking	Learners can recognise the impact of their choices and behaviours, both within the community and the environment.	Learners are driven by ethics and sustainability when making decisions.	Learners act to make sure that their ethical and sustainability goals are met.
Resources	Self-awareness and self-efficacy	Learners trust their own ability to generate value for others.	Learners can make the most of their strengths and weaknesses.	Learners can compensate for their weaknesses by teaming up with others and by further developing their strengths.
	Motivation and perseverance	Learners want to follow their passion and create value for others.	Learners are willing to put effort and resources into following their passion and create value for others.	Learners can stay focused on their passion and keep creating value despite setbacks.

# ASSESSING ENTREPRENEURSHIP 1: STUDENTS

## 2. “EntreComp Overview” (Bacigalupo, Kampylis, Punie & Van den Brande, 2016)

Into action	Mobilising resources	Learners can find and use resources responsibly.	Learners can gather and manage different types of resources to create value for others.	Learners can define strategies to mobilise the resources they need to generate value for others.
	Financial and economic literacy	Learners can draw up the budget for a simple activity.	Learners can find funding options and manage a budget for their value-creating activity.	Learners can make a plan for the financial sustainability of a value-creating activity.
	Mobilising others	Learners can communicate their ideas clearly and with enthusiasm.	Learners can persuade, involve and inspire others in value-creating activities.	Learners can inspire others and get them on board for value-creating activities.
	Taking the initiative	Learners are willing to have a go at solving problems that affect their communities.	Learners can initiate value-creating activities.	Learners can look for opportunities to take the initiative to add or create value.
	Planning and management	Learners can define the goals for a simple value-creating activity.	Learners can create an action plan, which identifies the priorities and milestones to achieve their goals.	Learners can refine priorities and plans to adjust to changing circumstances.
	Coping with uncertainty, ambiguity and risk	Learners are not afraid of making mistakes while trying new things.	Learners can evaluate the benefits and risks of alternative options and make choices that reflect their preferences.	Learners can weigh up risks and make decisions despite uncertainty and ambiguity.
	Working with others	Learners can work in a team to create value.	Learners can work together with a wide range of individuals and groups to create value.	Learners can build a team and net works based on the needs of their value-creating activity.
	Learning through experience	Learners can recognise what they have learnt through taking part in value-creating activities.	Learners can reflect and judge their achievements and failures and learn from these.	Learners can improve their abilities to create value by building on their previous experiences and interactions with others.

## Randomized

Levels of proficiency		
Foundation	Intermediate	Advanced

For each of the groups of three competencies listed below, mark with X the square that best reflects your level.

1. I can build an inspiring vision that engages others.  
2. I can define a desirable future.  
3. I can use my vision to guide my strategic decision-making.

4. I can transform ideas into solutions that create value.  
5. I can identify and refine ideas that create value.  
6. I can develop multiple ideas that create value.

7. I can identify opportunities to generate value.  
8. I can know how to seize and shape opportunities to respond to challenges for creating value.  
9. I can identify opportunities to address needs that have not been met.

10. I can understand and appreciate the value of ideas.  
11. I can develop strategies to make the most of the value generated by ideas.  
12. I can understand that ideas can have different types of value, applicable in different ways.

13. I can understand the impact of their choices and behaviours, both within the community and the environment.  
14. I can act in line with ethics and sustainability when making decisions.  
15. I can make sure that ethical and sustainability goals are met.

16. I can compensate for my weaknesses by teaming up with others and further developing our strengths.  
17. I can make the most of my strengths and weaknesses.  
18. I can understand my own ability to generate value.

19. I can be focused on what enthusiasms me and keep creating value despite setbacks.  
20. I can choose to follow what enthusiasms me for create value.  
21. I can know how to put effort and resources into following what enthusiasms me and create value.

8. I am good at finding and using resources responsibly.  
I know how to define strategies to mobilise resources needed to generate value.  
I can gather and manage different types of resources to create value.
9. I can draw up the budget for a simple activity.  
I am able to find funding options and manage a budget for a value creating activity.  
I know how to make a plan for the financial sustainability of a value creating activity.
10. I am able to persuade, involve and inspire others in value-creating activities.  
I can inspire others and get them on board for value-creating activities.  
I am good at communicating my ideas clearly and with enthusiasm.
11. I am willing to have a go at solving problems that affect my community.  
I can initiate value-creating activities.  
I can look for opportunities to take the initiative to add or create value.
12. I can create an action plan, which identifies the priorities and milestones to achieve my goals.  
I am good at refining priorities and plans to adjust to changing circumstances.  
I can define the goals for a simple value-creating activity.
13. I am not afraid of making mistakes while trying new things.  
I am good at weighing up risks and making decisions despite uncertainty and ambiguity.  
I can evaluate the benefits and risks of alternative options and make choices that reflect my judgement.
14. I know how to work together with a wide range of individuals and groups to create value.  
I can work in a team to create value.  
I can build a team and networks based on the needs of my value-creating activity.
15. I can improve my abilities to create value by building on my previous experiences and interacting with others.  
I can recognise what I have learnt through taking part in value-creating activities.  
I am able to reflect and judge my achievements and failures and learn from these.



# ASSESSING ENTREPRENEURSHIP 1: STUDENTS

## 2. “Budapest Agenda: Enabling Teachers for Entrepreneurship Education” as reference document)

### The Budapest Agenda:

### Enabling Teachers for Entrepreneurship Education

The aim of the 'Budapest Agenda' is to provide a catalogue of measures to be drawn upon by stakeholders at all levels within the worlds of education, business and the wider community in order to take forward the development of teacher education in entrepreneurship. It draws on the work and experiences of practitioners and policy makers from across Europe, EU partner countries from the EU pre-accession and Mediterranean neighbourhood regions, and is backed up by good practices, as evidenced by this report. It is intended to be used by all those with an interest in the subject, who can select measures and tailor them to their own particular circumstances. Each action indicates the relevant actors.

	EU	Member States	Educational Authorities	Regional/Local Authorities	Schools	Intermediary Organisations <sup>1</sup>	Business Entrepreneurs	Teacher Education Institutions
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**ENTREPRENEURSHIP ENVIRONMENT ASSESSMENT – FOR TEACHERS  
BUDAPEST AGENDA FRAMEWORK**

Disagree completely	Disagree	I don't know	Agree	Agree Completely

***At your HEI (Higher Education Institution), regarding Entrepreneurship Education (EE)***

1. Students have entrepreneurship compulsory modules.
2. In classes practical methods are used (like active learning, practical experiences).
3. Students have access to authentic tasks, by creating links to the local community (business, local authorities, third sector) to identify and get access to real life tasks.
4. Students have internships and placements in enterprises, or shadow a entrepreneurs.
5. Students are assessed for the transversal entrepreneurship key competencies.
6. Student's entrepreneurial competences and experiences are considered for selection.
7. There are sustainable and systematic partnerships with businesses, social enterprises and NGOs rather than ad hoc links.
8. There are national strategies for entrepreneurship education with a clear vision of and objectives for the role of teachers as coaches and facilitators.
9. Such a vision is owned by all stakeholders, at policy and operational levels.
10. Entrepreneurship education is a mandatory part of the curriculum.
11. There are minimum standards as part of quality frameworks and enforce through inspection regimes.
12. There is a label of accreditation for innovative approaches in teaching, thus helping entrepreneurship to quickly identify good practices.
13. Appropriate student assessment methods have been introduced into entrepreneurship education so that students become able to the put into practice.
14. There are incentives that reward entrepreneurial teachers.
15. Such incentives can be both financial and non-financial, e.g. training, greater autonomy, international networking.
16. There are resource centres and quality assured centres of expertise to gather and make available good practices for teachers.
17. In my HEI have been developed Tool Boxes of entrepreneurial teaching methods.
18. Effective communication strategies for all partners to promote the need for entrepreneurship have been developed.
19. Self-sustaining communities of entrepreneurship for teachers, e.g. through discussion forums and focus groups, have been developed.
20. Such groups support continuous improvement and innovation and also help to disseminate their practice and enthusiasm.
21. Learning opportunities as part of the HEI strategy where identified.
22. Teachers buy in to and ultimately own their own entrepreneurial continuing professional development, e.g. through the appointment of entrepreneurship 'champions' to promote the benefits and dispel myths.
23. Links with local entrepreneurs have been established in order to develop entrepreneurial mentoring.
24. Mentoring links have been developed into comprehensive programmes.
25. Entrepreneurial skills and attitudes in teacher's recruitment and selection activities have been prioritise.
26. There are national programs to promote and recognize entrepreneurial excellence..
27. My HEI has level plans with a shared understanding of entrepreneurship education, clear objectives and define the actions needed, and which are owned by the whole community, and which include strategies for business engagement.
28. There 'open door' policies in my HEI to make them accessible to their local communities; and enabling them to draw on the skills and talents of local people.
29. There is support for the role of my HEI leaders in the development of entrepreneurship education, ensuring the inclusion of entrepreneurship education within their continuing professional development.
30. In my HEI entrepreneurship coordinators have been appointed.
31. There is stimulation of collaboration between entrepreneurs and my HEI to support teachers as facilitators.
32. The entrepreneurial talents and experiences of existing teachers are used in supporting their colleagues.
33. There is HEI-to-HEI initiatives where partnership, networking and good practice exchange have been implemented.
34. EU-wide networking, mobility and know-how exchange is implemented.
35. The later involve both face-to-face and virtual methods, and aim to foster self-sustaining online communities.

# METHODOLOGICAL VALIDATION

ected the appropriate scales/instruments for assessing creativity and entrepreneurship in order to accomplish needs analysis.

**Partners,**

1. **To translate the scales/instruments** to each partner language from the English version, by a native specialist fluent in English:
  - Inventory of Creative Activities and Achievements (ICAA), created by Diedrich and colleagues (2018);
  - the questionnaire to measure attitudes within an organization toward creativity and creative problem solving or KEYS (2013);
  - Teaching Entrepreneurship Environment Questionnaire (TEEQ);
  - EntreComp Questionnaire for Students (ECQS).
2. **To back translate the scales/instruments** from each country language into English. This back-translation should be made by a native English speaker in the country language.
3. **To discuss the necessary improvements** coming from divergences noted in the process of translation and back-translation.

# METHODOLOGICAL VALIDATION

ers

**Primary Study** of the scales/instruments (ICAA, KEYS, TEEQ, ECQS) with 20 students/teachers from different courses and study levels to assess: reliability, validity, and comprehensibility and to estimate response time (use of an observation grid).

Regarding this process, we recommend following (Rea & Parker, 2014, 37-38):

“Once the researcher is satisfied with the draft questionnaire, the next step is to conduct a pre-test - a small-scale implementation of the questionnaire that assesses such critical factors as the following:

- a) **Questionnaire clarity:** Will respondents understand the questions? The researchers may find that certain ambiguities exist that may confuse respondents. Are the response choices sufficiently clear to elicit the desired information?
- b) **Questionnaire comprehensiveness:** Are the questions and response choices sufficiently comprehensive to cover a reasonably complete range of alternatives? The researchers may find that certain questions are irrelevant, incomplete, or redundant and that the stated questions do not cover all of the important information required for the study.
- c) **Questionnaire acceptability:** such potential problems as excessive questionnaire length or questions that are perceived to invade the privacy of respondents, as well as those that may abridge ethical or moral standards, must be identified and addressed by the researchers.
- d) The sample size for the pre-test is generally in the range of twenty to forty respondents; however, for very large sample surveys, it is not unusual for a pre-test to contain a larger sample. The researcher is not really interested in statistical accuracy at this point; rather, interest centers on feedback concerning the overall quality of the questionnaire's construction. Accordingly, the researcher will select respondents from an appropriate working population but need not be concerned about selecting them through a random sampling procedure”

# METHODOLOGICAL VALIDATION

**Pilot Study** with 150 subjects in order to obtain indicators for TEEQ and ECQS construct validity, using the PANAS-X (Watson & Clark, 1994.), Cronbach's Alpha (Cronbach, Larsen, & Griffin, 1985) and Rosenberg Self-esteem Scale (1989) . NB: ICAA and KEYS already passed this requirement

.. To analyse the data and make the necessary changes in the instruments to improve their psychometric properties

! To prepare the entire data collection protocol for the definitive data collection for the NA. Protocol in GoogleForms, informed consent, communication plan, answer storage links.

! To carry out the NA study in each partner country with the target groups: 490 to 600 students/teachers higher education: divulgation and implementation of the GoogleForms questionnaires (UC platform)

analyse data and make national and global reports

Appendix 2

Evrak Tarih ve Sayısı: 08.06.2021-33566



T.C.  
SAKARYA ÜNİVERSİTESİ REKTÖRLÜĞÜ  
Etik Kurulu



Sayı : E-61923333-050.99-33566  
Konu : 34/65 Prof. Dr. Osman TİTREK

08.06.2021

Sayın Osman TİTREK

İlgi : Osman TİTREK, the writing with the date 29.04.2021 and the " 0 "

Prof. Dr. Osman TİTREK's application has been approved with the decision, the number " 65 " and the date 05.05.2021. The decision has been made at our University's Social and Humanities Sciences Ethics Committee's Presidency. The sample of the decision has been reported on the addition.  
For your kind attention.

Prof. Dr. İsmail HİRA  
Sosyal ve Beşeri Bilimler Etik Kurulu  
Başkanı

Appendix 3

DECISION

The 65th Prof. Dr. Osman TİTREK's work, which has a heading called " Beyond the Limits: Developing Entrepreneurship Via Creativity in Schools " has been opened to discussion.

At the end of the discussions that has been made, Prof. Dr. Osman TİTREK's work, called " Beyond the Limits: Developing Entrepreneurship Via Creativity in Schools " has been decided unanimously as an appropriate work on the point of ethical view.

## Excursus



## The concept of competence

To disambiguate the concepts of competencies, skills and attitudes, a clarification is needed.

After an intense and prolific debate, near the end of the last century, that made competence a popular issue within the business world, the concept was then transferred to the educational domain under the influence of the so-called “managerialistic” trend. Accordingly, to Durand (1998), the use of the concept initially relied upon a “resource-based view” and led to a “knowledge-based approach” that in turn motivated a theory of “competency-based strategy”. However, at that time the term competence was simply being used to enlarge the concept of a resource without really dissipating its blatant equivocity; nevertheless, the author foresees that competences can give substantially contribute if the resource-based view is transcended<sup>3</sup>.

However, problems immediately arise from the author’s statement of having borrowed from educational research the concepts of knowledge, know-how and attitudes as the three key constitutive elements of competences, while then referring to them as the three generic forms of competences, or the three categories of competence, which he figures as being competence’s interdependent dimensions, as well as the generic axes of the competence referential. Such amphibological discourse opens up a perplexity never clearly resolved by the author’s discussion.

Durand defines the three dimensions or generic axes of the competence referential as follows (Durand, 1998, pp. 21-22). “Knowledge corresponds to the structured sets of assimilated information which make it possible to understand the world, obviously with partial and somewhat contradictory interpretations. Knowledge thus encompasses the access to data, the ability to enact them into acceptable information and to integrate them into pre-existing schemes which evolve along the way.”<sup>4</sup>

Know-how relates to the ability to act concretely according to predefined objectives or processes. Know-how does not exclude knowledge but does not necessitate a full understanding

---

<sup>3</sup> Still, one must keep in mind that the developing of such a new conceptual model relates to a competence based theory of the firm, i.e., the management context and purpose.

<sup>4</sup> We can accept the late statement, as long as it is supposed to be a result of intellectual processes: it is not expected that data enact all by itself into acceptable information and the later integrates all by itself into pre-existing schemes. In fact, the very reference to the “ability to” denounces the required underlying cognitive activity.

of why the skills and capabilities, when put to operations, actually work. Know-how thus in part relates to empiricism and tacitness.<sup>5</sup>

Attitudes are too often neglected in the resource-based view as well as in the competence-based theory of the firm. This may be due to the traditional lack of interest of economists in behavioural and social aspects. We believe that behaviour but even more so identity and will (determination) are an essential part of the capability of an individual or an organization to achieve anything. This is a matter of choice in defining concepts. We argue that a dedicated organization, eager to succeed, is more competent than a demoralized, passive one with, exactly, the same knowledge and know-how.”

The main achievement of Durand’s work is, in our point of view, to have produced an integrative perspective of interdependent competence’s dimensions which gains clarification with the following representation.<sup>6</sup>

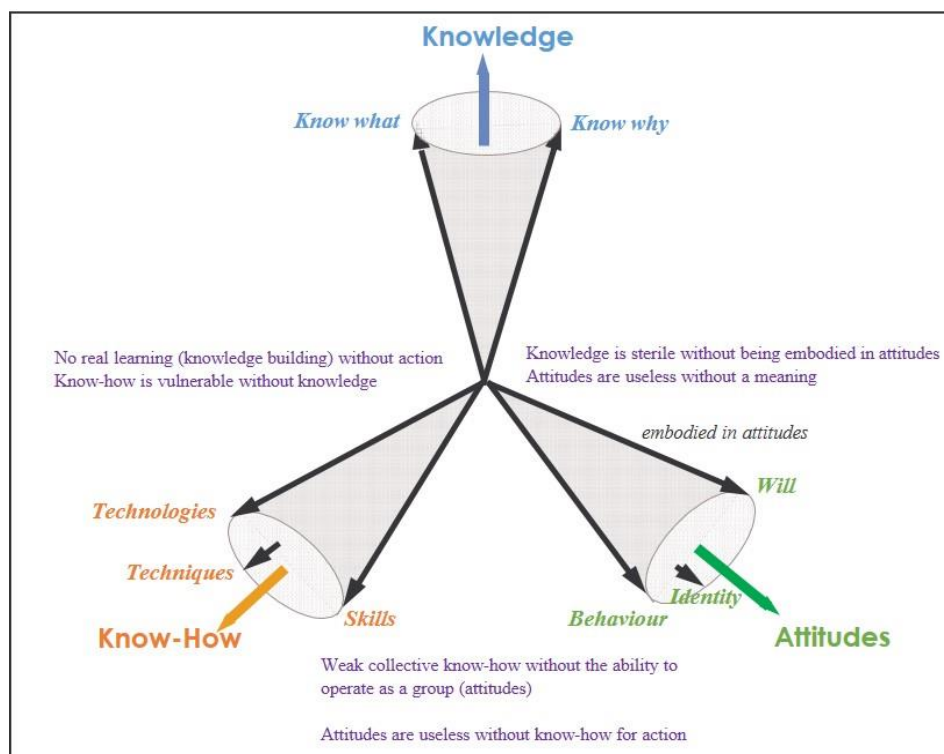


Figure 2 - Enriching the three basic categories of competence (Adapted from Durand, 1998)

<sup>5</sup> Here Durand is referring to a specific level of Know-how, the simple doing and skills, which rely in tacit knowledge. Skill means I can do it based on tacit ability, on the contrary know-how means “I know how to do it, I can do it and I can show how to do it to someone else”. We infer from Durand’s explanation that all know-how could have passed through a tacit phase corresponding to a skilfulness way of performing, either physically, manually or intellectually. It is also important to notice here that know-how does not necessarily pertains psychomotor or mechanical processes, they can also be related to cognitive procedures.

<sup>6</sup> One must notice that “identity” stands here for “the shared vision and organizational structure” (Durand, 1998, p. 35), in fact, according to Durand “Shared values, beliefs, rites and taboos are symptoms of the identity” (Durand, 1998, p. 12).

Relying on a Piagetian approach, Durand (1998, p. 33) stresses that “Knowledge and know-how are, in fact, built simultaneously as learning needs action.” [Moreover, he extrapolates that] learning, actually, takes place in organizations simultaneously for the three generic dimensions [...] This happens, in parallel but in an interrelated mode, through exposure to external data, action and interaction.” Therefore, we have to acknowledge that the author advances within a constructive practical and psychosocial framework for describing the learning process. Such an idea will become clearer when his understanding of the role played by action and interaction in learning becomes detailed.

While skills refer to tacit know-how – understood as a composite dimension –, competences are the result of a confluence between knowledge, know-how and attitudes. Therefore one must keep in mind that the three dimensions of competences are to be taken as interdependent: there is no learning (knowledge building) without action; all know-how is vulnerable without knowledge; know-how cannot be built without a social context where attitudes play a significant role; knowledge is sterile without being embodied in attitudes; as attitudes are useless without meaning and know-how for action. Hence consequently, expertise can only emerge by transcendentally combining the three generic dimensions into an integrated higher level of competence: experts understand, can explain why they perform as they do and perform with state-of-the-art ability, going beyond simple assimilation.

The author takes further the enrichment of the three dimensions by, for instance, incorporating motivation in the attitudes category and referring to “identity (the shared values, rites, taboos and beliefs) [as] operating as a cement holding the organizational pieces together at least as efficiently as any other coordinating and integrating mechanism” (Durand, 1998, p. 29).

Relating to the dynamics of competence building, the author explains that “competence is a stock accumulated as a result of an ongoing flux of learnings, reinforcing and enlarging the competence-base of the organization” (Durand, 1998, p. 30). While referring once again to forms of competence, he proposes that “Information is acknowledged, sieved, transformed and adapted data to fit pre-existing structures of knowledge” (Durand, 1998, p. 16); thus, knowledge is constructed by the process of integrating and assimilating information into frameworks responsible for ensuring coherence and structure to the accumulated knowledge base. On its side, Know-how is constructed through action, by imitating, observing and companionship, taking grounds on tacitness, but it evolves up to the point of shaping skills and techniques, which underpinned by knowledge about performing produce know-how. On the other hand, attitudes are developed through interaction – which we admit has to rely as much as know-how in

imitation, observation and companionship – that leads to the adoption of installed cultural values and shared basic commitments. Finally, expertise represents more than a difference in degree in the competences’ development continuum, it refers rather to a qualitative jump by merging the three generic dimensions.

Albeit Durand’s approach was crafted for companies’ strategic management, he indeed deploys three interdependent and integrative dimensions of the learning processes; he produces a reasoning explanation of its acquisition sequence; and offers a framework to understand complex learning objectives we can now put under the concept of competences. Nevertheless, a reframed approach is possible and even necessary if we want to shake off the “managerialistic” corset that originally grounded the proposal.

According Deakin Crick (2008, p. 313), cited by the European Commission (2013, p. 9) competence is described as “a complex combination of knowledge, skills, understanding, values, attitudes and desire which lead to effectiveness, embodied human action in the world, in a particular domain [...] it involves tacit and explicit knowledge, cognitive and practical skills, as well as dispositions (motivation, beliefs, value orientations and emotions) (Rychen & Salganik, 2003); it enables teachers to meet complex demands, by mobilising psycho-social resources in context, deploying them in a coherent way; it empowers the teacher to act professionally and appropriately in a situation (Koster & Dengerink, 2008); it helps ensure teachers' undertaking of tasks effectively (achieving the desired outcome) and efficiently (optimizing resources and efforts); it can be demonstrated to a certain level of achievement along a continuum (González & Wagenaar, 2005)”.

In order to go further we will draw on the definition recently presented by the Council of Europe (2016), for its project entitled “Competences for democratic culture: Living together as equals in culturally diverse democratic societies”. Aside the specific domain that the model wants to address, it provides a twofold definition of competence understood as “the ability to meet complex demands within a given context” (Council of Europe, 2016, pp. 23-24), which we found very insightful and inspiring for our purposes: “Competence is the ability to mobilise and deploy relevant psychological resources (i.e. values, attitudes, skills, knowledge and/or understanding) in order to respond appropriately and effectively to the demands, challenges and opportunities [...] The present model treats competence as a dynamic process. This is because competence involves the selection, activation, organisation and co-ordination of relevant psychological resources which are then applied through behaviour in such a way that the individual adapts appropriately and effectively to a given situation. [...] In addition to this global and holistic use of the term “competence” (in the singular), the term “competences” (in

the plural) is used in the current account to refer to the specific individual resources (i.e. the specific values, attitudes, skills, knowledge and understanding) that are mobilised and deployed in the production of competent behaviour. Hence, on the present account, competence consists of the selection, activation and organisation of competences and the application of these competences in a co-ordinated, adaptive and dynamic manner to concrete situations.” (Council of Europe, 2016, pp. 23-24).

The twenty competences, resulting from a long sieving and refining process, are summarised in the following picture.

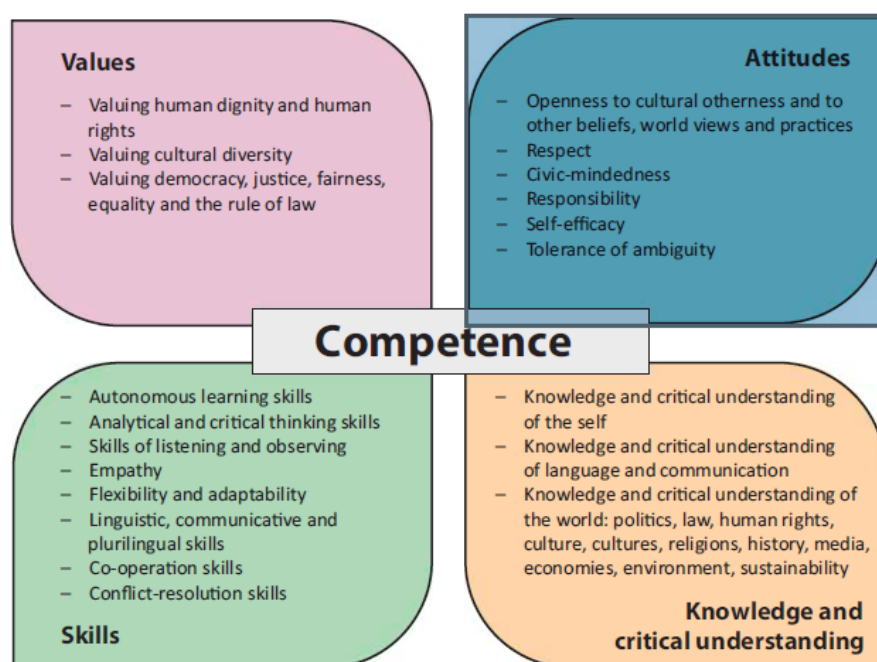


Figure 3 - The 20 “Competences for democratic culture” (Council of Europe, 2016, p. 35)

At a first glance, there remains no doubt that the requirements of interconnectedness between the dimensions, as well as the reference to “competence” and “competences” and the dynamic way of their acquisition, are common to Durand’s Model. However, there are also very striking differences: a new category termed “values” is proposed; and Durand’s knowledge category is now labelled as “Knowledge and critical understanding”.

Such a dynamic approach evokes an underlying model that seems to assume a holistic competence understanding based on other competences from different nature: as values, attitudes, skills and knowledge and critical thinking. This takes us to assume that the author regards competences as complex and high-level forms of proceeding, in different realms, possibly also leaning in other middle or low-level modes of the same realm and level. Thus, what we discern here is a network of competences that mutually support each other. Such theoretical

framework seems possible to advocate since complex competences could not be understood as insulated dynamics, but rather as interconnected active “meta-organizers”, forming constellations or clusters, depending on a subjective activation elicited by a given situation.

However, a perplexity emerges instantly from the reference to skills as competences and vice-versa; an ambiguity which is not congruent with Durand’s theory, where know-how outranks skills, being of higher complex order while the later standing for a conditional prior phase of the former’s acquisition. Another perplexity arises from the fact that the model includes critical thinking in the skills domain while advancing a different dimension termed “knowledge and critical understanding”. We have no problem in admitting some critical thinking conditional competences, as intermediate tasks supporting the higher-order process of critical thinking. However, it is difficult to reduce critical thinking to the skill level and at the same time merging it with knowledge, which could, obviously, be critical if produced by critical thinking processes. It must be recalled here that skills stand for tacit know-how, something that cannot ever be admitted for critical thinking, without risking a paradox similar to admitting a train autonomously conducted when running in computer mode. Besides, as above mentioned, critical thinking requires self-knowledge and reflexivity as supporting competences. A last remark needs to be made concerning the inconsistent distribution of the elements included in each category. So being, a complete reformulation on how to address the contradictory, inconsistent, and amphibological issue of capabilities, objectives, skills and competences.

We have arrived at a reading on competences that allow us to say now that we can rely on a competence framework to structure teaching and learning. This includes the possibility of planning it, namely by specifying the items that may convey, within each of the complementary domains of knowledge, know-how, attitudes and values.

EU BEYOND THE LIMITS: DEVELOPING ENTREPRENEURSHIP VIA CREATIVITY IN SCHOOLS

PROJECT -2020-1-TR01-KA203-093989

**Project Coordinator**

Sakarya University - Türkiye

**Partnership**

De Montfort University – England

CSCS- Italy

Lieapaja University – Latvia

Padova University- Italy

University of Coimbra- Portugal

Agora University of Oradea-Romania

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