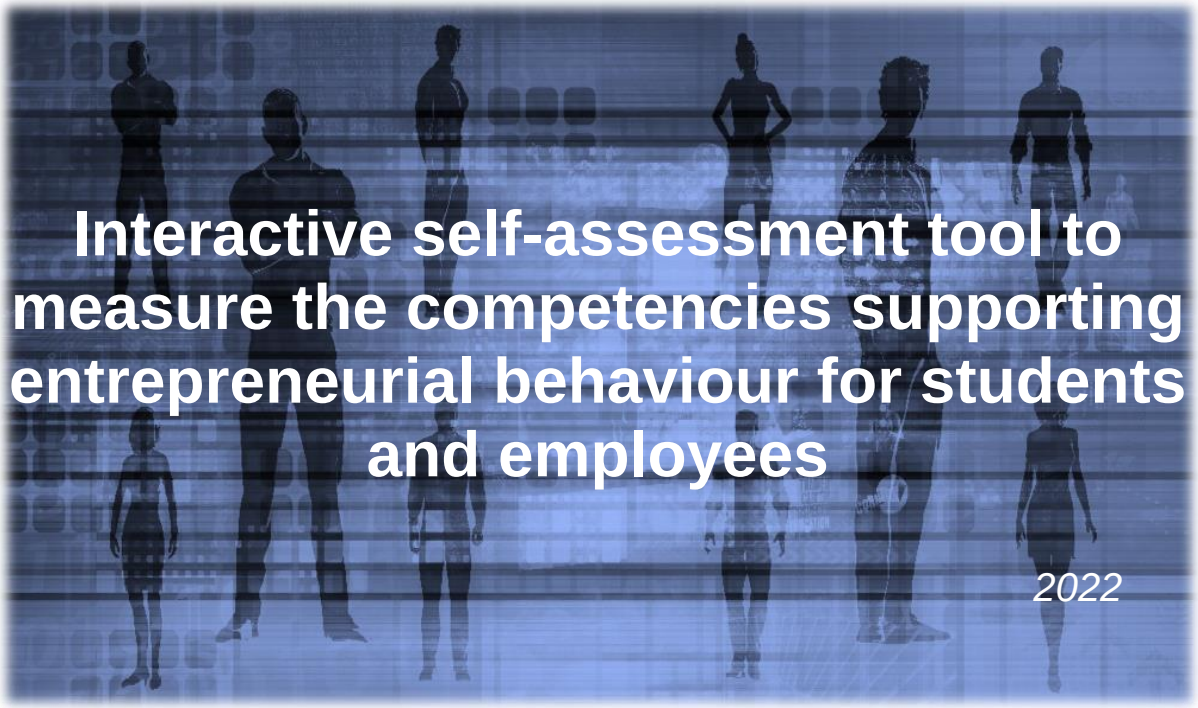
"Be Competent in Entrepreneurship":

Knowledge Alliances for Developing Entrepreneurship Competencies for the Benefit of Higher Education and Business



Interactive self-assessment tool to measure the competencies supporting entrepreneurial behaviour for students and employees

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Contents

1. Introduction

The activities for finding possibilities for the development of workplace environment are planned to understand the personal-environment fit considering the individual differences, individual and company goals and professional aspirations. Personal level fit index analysis is foreseen based on the existing research tools showing possible gaps between personal and institutional expectations related to ECs.

The aim of the report is to explain the development of the interactive self-assessment tool to measure the level of personal entrepreneurship competence (EC) supporting the entrepreneurial behaviour of students and employees. The main objectives are to identify:

- the theoretical basis of the development of the self-assessment tool
- the main principles of the creation of an interactive EC self-assessment tool for employees and students and advice for their use in universities and businesses.

The interactive EC self-assessment tool to measure the level of personal EC is provided for the use of students and employees. The basis for the development of interactive self-assessment tool to measure EC relies on the methodology created under the Estonian entrepreneurship programme (source Venesaar et al., 2018; Venesaar et al., 2022) and it is developed further. The interactive self-assessment tool is meant for independent personal use for students and employees, which helps to get quick feedback about the strengths and weaknesses of persons and suggestions for the development of EC. The tool can be used among employees and students in each country, which allows them to get feedback about which sub-competencies are needed to pay more attention to in personal development of employees and/or students.

The interactive tool of the EC self-assessment includes the measurement of the level of EC sub-competencies, the feedback is based on the individuals' profiles. Considering the differences of countries and individuals, the profiles of students and employees should be determined in each country/university differently as the basis for the assessment calculations. The individual feedback about the level of self-assessment of students or employees helps them to understand what sub-competencies need to be supported with more attention in learning in universities and in companies.

The structure of the deliverable includes the theoretical basis of the development of the EC self-assessment, and the explanation of the creation of the digital solution for the self-assessment tool of EC. The report concludes with expressing the contribution of the project to the development of EE and subject-specific courses in universities in supporting the development of students' EC as well as the support of the development of EC of employees in companies.

The report is based on the BeCome Project Deliverable D4.4.

The authors of the project are Urve Venesaar, Marianne Kallaste, Katrin Arvola (TalTech), Fanny Karlsson (Vincit), Petri Nokelainen (TAU) with the support of other partners.

2. Theoretical basis of the development of the EC self-assessment tool

The EC self-assessment tool used in BeComE project is based on the entrepreneurship competence model elaborated under the Estonian entrepreneurship programme (in 2016-2018) (Estonian Ministry of Education and Research, 2016: Arro et al., 2018). Based on the definition of entrepreneurship, the concept of EC can be conceived as a comprehensive set of knowledge, skills and attitudes that are essential for value creation during the implementation of ideas, for the development of entrepreneurial mind-set of learners, and sustainable coping with work and everyday life (Venesaar et al., 2018). The theoretical basis of defining the set of knowledge, skills and attitudes (Vestergaard et al., 2012) relies on the Entrepreneurship Competence Model (Venesaar et al., 2022) (Figure 1), built around the definition of entrepreneurship as a value-creation process (individual–opportunity nexus) (Shane & Venkataraman, 2000). Based on the broader 'enterprising' view (Jones & Iredale, 2010) of entrepreneurship requires to support the development of the above-mentioned sub-competencies in four areas (self-management; creative thinking and finding solutions; managing social situations; acting upon opportunities and ideas) and is focused on the integration of learning entrepreneurship as a key competence of lifelong learning in universities as well as in businesses. Besides the definition of entrepreneurship, the model relies on the theoretical and conceptual perceptions developed in different disciplines related also to (developmental) psychology, education and social psychology. The previous experiences in the formation of holistic competence models are considered (e.g., Le Deist & Winterton, 2005; Mulder et al., 2009; Rychen & Salganic, 2003). Relying on the above mentioned theoretical basis and the support of systems theory (e.g Dori & Sillitto, 2017; von Bertalanffy, 1968) allows us to confirm that all sub-competencies are important and can be developed to acquire overall entrepreneurship competence by embedding them in the learning process of different subjects and contexts (European Commission, 2012; 2014).

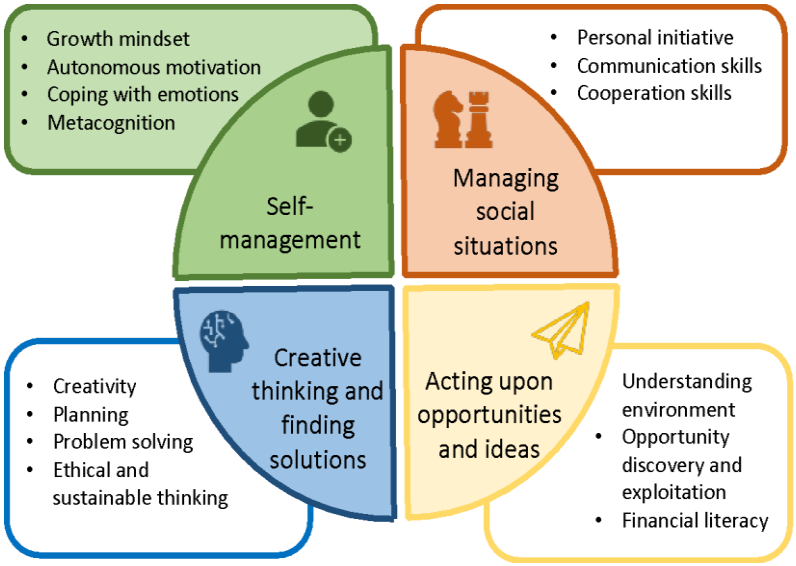

Figure 1. Comprehensive entrepreneurship Competence Model. *Source:* Venesaar et al. (2018)

The entrepreneurship competence self-assessment tool is measuring all 14 sub-competencies of the entrepreneurship competence model and the theoretical basis of the assessment of each sub-competence relies on the theoretical and conceptual perceptions related to (developmental) psychology, education, entrepreneurship and social psychology. The description of theoretical basis of the entrepreneurship self-assessment tool is described as follows:

Name of sub-competence	No of items	Theoretical sources
Metacognition	3	Pintrich (1991)(e.g.,' I analyse what I already know about this situation')
Growth (fixed) mindset	3	Yeager and Dweck (2012)(e.g., 'You have to be a natural born talent to be an entrepreneur')
Autonomous motivation	4	Weinstein, Przybylski & Ryan (2012)(e.g., 'My actions are congruent with who I really am')
Coping with emotions	3	Garnefski & Kraaij (2006)(e.g. 'I can manage my feelings if something goes wrong')
Creativity	3	Karwowski (2014)(e.g., 'I believe in my creative abilities')
Problem solving	4	Basadur (1995) and Basadur & Goldsby (2016)(e.g., 'I ask myself lots of different questions about the nature of the problem')
Planning	4	Dawsoni & Guare (2011) and Cowan (2014)(e.g., 'I typically break big tasks down into subtasks and timelines')
Ethical and sustainable thinking	4	Ploum, Blok, Lans & Omta (2017)(e.g., 'I can identify well the opportunities of sustainable development')
Personal initiative	3	Frese (2009) and Frese & Fay (2001)(e.g., 'I have been usually a powerful force for constructive change')
Communication skills	3	Zhou & Ee (2012)(e.g., 'I am tolerant of my partners' mistakes')
Cooperation skills	3	Lower, Newman & Anderson-Butcher (2015)(e.g., 'I am able to cooperate with different kinds of people')
Opportunity discovery and exploitation	4	Tang, Kacmar & Busenitz (2012) and Kyndt & Baert (2015)(e.g., 'I can recognise the untapped opportunities')
Understanding environment	3	Man, Lau & Snape (2008)(e.g., 'I am aware of the development trends in my specialty/area of activity')
Financial literacy	4	Kyndt & Baert (2015) and OECD (2016)(e.g., 'Before I invest money, I examine other possibilities')

Overall, the comprehensive EC model and its interactive self-assessment tool presents a pragmatic view of the needed entrepreneurship sub-competencies to develop in different contexts of learning. The next section explains how it might be accomplished.

3. The main principles of the creation of interactive EC self-assessment tool

The creation of the digital solution for the self-assessment of EC to use for employees and/or students includes the preparation of content materials as follows: self-assessment questions and statements, assessment criteria, method of feedback, content of feedback. The solution should include the results of self-assessment and feedback by each sub-competence automatically for individuals (employees or students), as well as the total average results for enterprise/school or group of individuals (employees or students). This approach gives a possibility for individuals and institutions to be aware of sub-competencies with different levels of assessment of employees or students. This method allows to identify students or employees with a lower level of self-assessment and directing them to pay attention to the development of the skills and attitudes needed in the labour market. The digital solution of EC self-assessment can be a basis of showing a need to support the development of EC for increasing the employability of individuals.

Entrepreneurship competence self-assessment questions and statements are based on theoretical and conceptual perceptions related to (developmental) psychology, education, entrepreneurship and social psychology (see chapter 2). The description of feedback of self-assessment of individuals or groups is developed also on the basis of the same sources. The self-assessment criteria are based on the profiles of target groups of university, where the assessment should take place.

1) Entrepreneurship competence measurement questions for employees and/or students

Thinking about knowledge, skills and attitudes allows us to understand the important issues, which are influencing the way of developing the EC of individuals (employees or students). For that reason the questionnaire is developed for mapping the main areas connected with enterprising behaviour and entrepreneurial attitudes relying on theoretical and conceptual perceptions related to the sources mentioned above.

2) The creation of the **system of average assessment criteria** is suggested to calculate based on students' profiles in three groups (low, average, high) based on the database from previous research among students according to their study level or employees in companies. This gives a possibility for individuals and institutions to get feedback about the entrepreneurship sub-competencies according to their level of self-assessments. The feedback for institutions and groups includes suggestions on how to support the development of entrepreneurship sub-competencies of individuals through study programmes or through the development of workplaces as learning environments in companies. It is suggested to collect the information of EC self-assessment among different target groups of students and employees of countries, and use the evaluation criteria accordingly.

3) Relying on the relevant evaluation criteria (in three groups) the interpretation of the **feedback of self-assessment of employees and/or students** is based on the

content of a single entrepreneurship sub-competence. In general, the higher the level of self-assessment of an individual, the more she/he tends to behave according to the features of the sub-competence. For example, the higher the sub-competencies of personal initiative, communication and cooperation skills were assessed, the better the individual tends to manage social situations. But each sub-competence has their own characteristics influencing the behaviour of the individual.

5) In the case of interest and using the digital self-assessment tool and the same as above principles, it is possible to create the f**eedback for the teachers or leaders (HR managers, coaches) of institutions or group level** about EC self-assessment results by sub-competencies and three evaluation levels. It is useful for teachers to get information about the group level of EC self-assessment results, which gives the knowledge about what sub-competencies are assessed lower and need more attention and support to develop them during the study process or through the development of workplaces as learning environments. Therefore, the use of interactive digital EC self-assessment supports the development of study programmes of entrepreneurship education as well as subject-specific courses. For company owners/managers or HR managers the use of EC self-assessment tool at the level of institution informs which entrepreneurship sub-competencies need to be developed among employees and how to develop the workplaces as “expansive learning environments” to support the development of EC among employees.

Conclusion

For the development of the workplace environment it is important to understand the personal - environment fit considering the individual differences, individual and company goals and professional aspirations. In the BeComE project the interactive EC self-assessment tool is used, which is based on the Estonian Entrepreneurship competence model elaborated under the Estonian entrepreneurship programme (in 2016-2018). In this project the digital version of EC self-assessment tool is developed. The source for the theoretical basis of EC self-assessment is published in the articles and the materials of Estonian entrepreneurship programme (Venesaar et.al.,2018; Venesaar et al., 2022) and also in the article published during the BeComE project (e.g. Venesaar et.al., 2023) and a number of other forthcoming articles about the results of project activities submitted to journals.

The digital tool for the self-assessment of EC is created interactive to use for employees and/or students. The preparation of EC self-assessment tool includes the content materials, assessment criteria, method of calculating feedback, and creating the content of feedback. The interactive digital tool for self-assessment of EC is for independent personal use for students and employees or their groups, and it helps to get quick feedback about the strengths and weaknesses of persons and the suggestions for the development of their EC. As the tool is for individual use of employees or students and their feedback is confidential, therefore this report describes the main principles of the creation of interactive self-assessment tool. After piloting the tool, the students' and teachers'/managers' reflections have been positive and they value the interactive EC self-assessment tool supporting the self-directed learning of target groups.

The project is contributing to the development of teaching and learning processes and results in universities and businesses with the creation of digital interactive EC self-assessment tool. It is useful for teachers to get information about the group level of EC assessment results, which supports the development of study programmes of entrepreneurship education as well as subject-specific courses. For company owners/managers or HR managers the use of self-assessment tool at the level of institution informs them, which EC needs to be developed among employees and how to develop the workplaces as "expansive learning environments" to support the development of EC among employees.

References

Arro, G., Jaani, J. Loogma, K., Malleus, E., Titov, E., Toding, M., Täks, M. and Venesaar, U.. "Ettevõtlikkuse ja Ettevõtlusõppe Süsteemne Arendamine Eestis." (2018). Available online (10.04.2019): https://xn--ettevtluspe-jfbe.ee/wp-content/uploads/2018/12/Raamdokument_web_3.pdf.

Basadur, B. (1995) *The power of innovation*. London: Pitman Professional Publishing.

Basadur, M., & Goldsby, M. (2016) *Design-centered entrepreneurship*. New York: Routledge Taylor and Francis Group.

Cowan, N. (2014). Working memory underpins cognitive development, learning, and education. *Educational Psychology Review*, *26*(2), 197-223.

Dawson, P., & Guare, R. (2016). *The smart but scattered guide to success: How to use your brain's executive skills to keep up, stay calm, and get organized at work and at home*. Guilford Publications.

Dori, D., & Sillitto, H. (2017). What is a system? An ontological framework. *Systems Engineering*, *20*(3), 207-219.

Estonian Ministry of Education and Research (2016). "Entrepreneurship programme "Systemic Development of Entrepreneurship and Entrepreneurship Education at All Educational Levels. Programme introduction" Tartu (in Estonian).

European Commission. (2012). *Effects and impact of entrepreneurship programmes in higher education.* Brussels: Directorate-general for Enterprise and Industry/European Commission. http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=5894&lang=en

European Commission. "*Entrepreneurship Education: A Guide for Educators."* Brussels: GHK Consulting Ltd. (2014).Frese, M., & Fay, D. (2001). Personal initiative: An active performance concept for work in the 21st century. *Research in Organizational Behavior, 23*(1), 133–187.

Frese, M. (2009). Toward a psychology of entrepreneurship – An action theory perspective. *Foundations and Trends in Entrepreneurship, 5*(6), 435–494.

Frese, M., & Fay, D. (2001). Personal initiative: An active performance concept for work in the 21st century. *Research in Organizational Behavior, 23*(1), 133–187.

Garnefski, N., & Kraaij, V. (2006). Cognitive emotion regulation questionnaire – development of a short 18-item version (CERQ-short). *Personality and Individual Differences*, *41*(6), 1045–1053.

Jones, B., & Iredale, N. (2010). Enterprise education as pedagogy. *Education+ training*. 52, 7-19.

Karwowski, M. (2014). Creative mindsets: Measurement, correlates, consequences. *Psychology of Aesthetics, Creativity, and the Arts, 8*(1), 62.

Kyndt, E., & Baert, H. (2015). Entrepreneurial competencies: Assessment and predictive value for entrepreneurship. *Journal of Vocational Behavior*, *90*, 13–25.

OECD (2016). *Global competency for an inclusive world*. PISA. http://www.oecd.org/pisa/aboutpisa/Global-competency-for-an-inclusive-world.pdf.

Le Deist, F. D., & Winterton, J. (2005). What is competence?. *Human resource development international*, *8*(1), 27-46.

Mulder, M., Gulikers, J., Biemans, H., & Wesselink, R. (2009). The new competence concept in higher education: error or enrichment?. *Journal of European industrial training* 33, 755-770.

Rychen, D. S., & Salganik, L. H. (Eds.). (2003). *Key competencies for a successful life and well-functioning society*. Hogrefe Publishing.

Lower, L. M., Newman, T. J., & Anderson-Butcher, D. (2015). Validity and reliability of the teamwork scale for youth. *Research on Social Work Practice*, 1–10. https://doi.org/10.1177/1049731515589614

Man, T. W., Lau, T., & Snape, E. (2008). Entrepreneurial competencies and the performance of small and medium enterprises: An investigation through a framework of competitiveness. *Journal of Small Business & Entrepreneurship*, 21(3), 257–276.

Pintrich, P. R. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ).*

Ploum,L. Blok, V., Lans, T., & Omta, O. (2017). Toward a validated competence framework for sustainable entrepreneurship. *Organization & Environment*, *31*(2), 113-132.

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, *25*(1), 217-226.

Tang, J., Kacmar, K. M. M., & Busenitz, L. (2012). Entrepreneurial alertness in the pursuit of new opportunities. *Journal of Business Venturing, 27*(1), 77-94.

Venesaar, U., Malleus, E., Arro, G., & Toding, M. (2022). Entrepreneurship competence model for supporting learners development at all educational levels. *Administrative Sciences, 12*(1). https://doi.org/10.3390/admsci12010002

Venesaar, U., Täks, M., Arro, G., Malleus, E., Loogma, K., Mädamürk, K., ... & Toding, M. (2018). Ettevõtluspädevuse mudeli empiiriline põhjendamine ettevõtlusõppe arendamise alusena. *Model of entrepreneurship competence as a basis for the development of entrepreneurship education). Eesti Haridusteaduste Ajakiri (Estonian Journal of Education)*, *6*, 118-55.

Venesaar, U., Antonelli, G., Dorożyński, T., Duarte, H. Kallaste, M., Riviezzo, A., Räisänen, M. & Santos, S.C. (2023). Entrepreneurship competence among students and employees: a comparative study in five European countries. In Charles H. Matthews and Susana C. Santos (Eds) Annals of Entrepreneurship Education and Pedagogy – 2023, pp. 120-144, Edward Elgar Publishing.

Vestergaard, L., Moberg, K., & Jørgensen, C. (2012). Impact of entrepreneurship education in Denmark–2011. *Odense: The Danish Foundation for Entrepreneurship-Young Enterprise*. Available online (15.12.2021): http://eng.ffe-ye.dk/media/202248/impact_of_entrepreneurship_education_in_denmark_2011.pdf.

Weinstein, N., Przybylski, A. K., & Ryan, R. M. (2012). The index of autonomous functioning: Development of a scale of human autonomy. *Journal of Research in Personality*, *46*, 397–413.

Von Bertalanffy, L. V. (1968). *General system theory: Foundations, development, applications*. G. Braziller.

Yeager, D. S., & Dweck, C. S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational psychologist*, *47*(4), 302-314.

Zhou, M., & Ee, J. (2012) Development and validation of the Social Emotional Competence Questionnaire (SECQ). *The International Journal of Emotional Education*, *4*, 27–42.