

Review Article

Competence Models as a Tool for Conceptualizing the Systematic Process of Entrepreneurship Competence Development

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Entrepreneurship Education (EE) is believed to be an important key to supporting learners to become entrepreneurial, which means it needs to be approached systematically. Competence models provide a platform to meaningfully embed varying interpretations, learning outcomes, and roles of EE and allow educators and other stakeholders to apply EE systematically throughout all education levels. The aim of this study was to understand how systematic entrepreneurship competence development throughout the education levels is conceptualized in different EE competence models. In other words, what are the critical aspects to consider while constructing systematic competence models for EE purposes? The results of the analysis of the competence models help educators, school boards, policymakers, local municipalities, researchers, and other relevant stakeholders to obtain a clearer understanding of how EE learning outcomes can be systematically achieved at all education levels. However, lacking empirical proof regarding the impact of the models' application, these models represent the "optimal set" of expected competencies for specific education levels and types. In its original form, a competence model established for a specific education system is unlikely to fit the needs and aims of other education systems. Thus, it is recommended that any model be adapted to a specific need and with a focus on learning outcomes.

1. Introduction

Entrepreneurship, defined by many as the creation and management of new ventures, allows innovation in products, services, and markets, generates jobs and supports competitiveness, and is thus considered as one of the key drivers of the economy [1, 2]. Society in its broader meaning, however, is improved not only by entrepreneurs but also by individuals with entrepreneurship competence (set of knowledge, attitudes and skills for opportunity recognition and exploitation, value creation, and action orientation). Such individuals are more prone to identify problems and take actions, enhancing social as well as economic well-being [3, 4]. Entrepreneurship Education (EE) is seen as a major driving force to enhance the development of entrepreneurship competence [3–6]. Thus, it is important to have a systematic approach to EE on all education levels to prepare learners to become entrepreneurial.

Learners need an understanding of how different cultural contexts enable innovation from early on and how youth and adults can stand ready to succeed in an entrepreneurial economy [7]. Hence, it is crucial to identify and compare how entrepreneurship competence can be developed systematically throughout the different education systems and levels.

In the European context, national EE strategies (which are the basis for systematic competence development) vary to a large extent. Firstly, there are specific strategies focusing solely on EE, which establish a common vision for various policy fields like education, innovation, and economic development (e.g., Estonia, Sweden, Norway, Finland, Belgium, Germany, and Wales). Secondly, many countries have broader education-related strategies that consist of aims for EE-like education and training, youth development, and/or lifelong learning strategies (e.g., Greece, Bulgaria, Latvia, Austria, Turkey, and Serbia). Third, there are broader

economy-related strategies that feature EE as a part of business, employment, and/or SME development strategies (e.g., Lithuania, Romania, Spain, and Scotland) [5, 8, 9]. The systematic development of entrepreneurship competence in different countries is thus examined in the context of national EE strategies.

On an individual level, less than one-fourth of the students in EU member states have been said to have participated in an entrepreneurship-related course or activity at school, and a great number of 15-year-olds lack basic problem solving skills [5]. The reasons for this vary: more than half of the countries have very few or no guidelines for specific teaching methods, very few countries include practical entrepreneurial experiences as a mandatory, regular part of their curriculum, EE learning outcomes are fragmented in most EU countries, and there is insufficient assessment of the EE learning outcomes [5, 10]. Although most of the EU member countries have shown an increase in developing EE, many countries have inconsistencies in their systematic development of competencies from primary through secondary and tertiary education. For example, in Estonia, France, and Italy, the cross-disciplinary (or other compulsory) EE-related activities in primary education are replaced or even duplicated by elective entrepreneurship courses at the successive education stages, making the competence development random [5, 11]. Thus, competencies laid down from the grassroots in primary school are not developed sustainably at the successive education levels. Also, in many countries like Estonia, Lithuania, Germany, and Spain, numerous initiatives in public and private sectors are run independently and with no plans for a coordinated systematic of competence development [5, 8, 11]. To increase the impact of EE and help teachers to understand the ways entrepreneurial competencies can be developed, a more coordinated approach to the gradual development of EE is needed [5].

Following this line of thought, the aim of the present study was to understand how various EE competence models conceptualize the systematic progress of developing entrepreneurship competence throughout the education levels.

2. The Need for a Systematic Approach to Competence Development in Entrepreneurship Education (EE)

2.1. Theory: Competence Development and Competence Modeling. Competence models and competence-based education have become widely spread throughout different fields of education as a central, strategic tool for educational development and integrating education with training and lifelong learning (e.g., The European Lifelong Learning Strategy, the OECD initiated *Definition and Selection of Competencies: Theoretical and Conceptual Foundations*, and others) [12–14]. McClelland [15] and Wesselink and Wals [16] complement the previous, stating that using competencies helps to describe human behavior associated with high job performance and thus they can be applied in strategic workforce planning, training, motivating, and performance management.

There are many definitions and classifications related to the terms competence/competences and competency/competencies. Le Deist and Winterton consider these terms useful in bridging the gap between education and job requirements [17]. Weinert adds that there are many different theoretical approaches for conceptualizing competence [18]. For example, various researchers define competence as sets of combined behaviors (knowledge, skills, and attitudes) that are important in the distribution of desired results (carrying out the task) in specific contexts [16, 19, 20]. Jensen and Schnack [21] highlight the aspect of action in their competence description, elaborating it as the ability to act now and in the future, taking responsibility for one's actions. Mulder et al. [22, p. 757] claim that “competence is seen as a series of integrated capabilities consisting of clusters of knowledge, skills, and attitudes necessarily conditional for task performance and problem solving and for being able to function effectively in a certain profession, organization, job, role, and situation.” Rychen and Salganik [23, p. 43], in considering the DeSeCo study [13] and Weinert's [18] work, have defined competence as “the ability to successfully meet complex demands in a particular context through the mobilization of psychological prerequisites (including both cognitive and noncognitive aspects).” Following previous lines of thought and considering the context of this article, we can say that entrepreneurship competence is a series of integrated capabilities consisting of knowledge, skills, and attitudes for taking entrepreneurial actions (opportunity identification, evaluation, and pursuit) and creating value (for others and society). In the present study, we speak of the concept of *entrepreneurship competence* to refer to the definition of entrepreneurship competence described above. When we use the term *entrepreneurial competencies*, we refer to the competencies, capabilities, and characteristics that belong to entrepreneurship competence.

The next step after establishing a clear definition of competence is to gain an understanding of how competence models were established and conceptualized. There are various approaches and classifications in the literature that are used for conceptualizing competence, like *action competence* [4, 21, 22], *key competencies* [12–14], *meta competencies* [24, 25], the *demand-oriented functional approach* [23], and others [18]. Recent authors of research have suggested using the multidimensional holistic approach to design educational competence models (as this approach is better aligned with education, learning, and workplace requirements) [16, 17, 26].

It should be noted that the term *competence model*, in this context, refers to the sets of competencies and characteristics forming the competence model. Moreover, it is “a standardized description of specific activities and competencies within a context (considering both the people and work performance perspective) that are necessary to function as a professional in a particular field” [16, 27–29]. Bartram [20] warns that too distinct models are hardly generalizable and overly broad model constructs may fail to apprehend relevant dimensions of performance, that is, dimensions of an observable goal-relevant action/behavior [30, 31]. Mulder [26] claims that competence models generated for education and training should be inclusive and in balance, cover the

whole spectrum of the whole profession, and be functional. Also, competencies should make sense and define a certain field of professional activity, like teaching, entrepreneurship, innovation, or others. Moreover, in education, competence profiles help to update and improve the overall quality of education and training by helping to also consider the needs of the sector or organizations, but only when the competencies are operationalized as unambiguously as possible [16, 32]. Barnett [33] argues that, in the United States, competence-based education failed because of the tendency to decontextualize competence by going into too much detail. Therefore, a distinction between personality- and performance-based criteria is needed with a balance between the two in order to ensure the clarity and understanding of the competence model. However, what the specific criteria for finding the right balance are remains somewhat unclear in the literature.

In sum, we can conclude that a number of criteria should be considered in constructing and conceptualizing competence models for educational purposes and could also be used as a basis for analyzing existing EE competence models. The aim, the definitions, and the approach of the competence model should be explicit and aligned with the purpose. Competencies listed in the models should relate to a specific educational context and have a reasonable balance (distinct versus inclusive) between personality, social context, and performance. Conceptual and operational as well as individual and social aspects of competencies and how these aspects of competencies advance in different education systems should be taken into account. For educational purposes, the whole spectrum of a competence model should be considered.

2.2. Theory: EE Competence Models and the Aims of EE. Until recently, only few EE competence models have been reported in the literature of which only two were supported by scientific proof [29, 34]. Another recent trend seems to be the advancement of holistic competence models favoring a gradual development of competence throughout education levels and in relation to qualification standards, hereafter simply referred to as “competence models” (e.g., the Danish model, EntreComp model, and EU model).

In the EE framework, the competence model is seen as a step-by-step advancement in various contexts and with learning outcomes and roles of EE throughout the education system [4, 35]. For teachers, competence models might serve as a practical tool to prepare and monitor learners’ competence development based on their previous experiences during different types and forms of education settings. More specifically, competence models help teachers to establish suitable learning aims, outcomes, learning activities, and assessment methods for their target group [34]. Using EE competence models in planning teaching and assessment allows teachers to set their focus on activities that support the development of entrepreneurship competence in various courses [4], such as engineering, humanities, and mathematics. Also, competence models support teachers in developing learners’ entrepreneurship competence by proceeding with progressively demanding assignments [36]. Thus, competence models help teachers and educators to efficiently enhance learners’

entrepreneurship competence development throughout their schooling [12, 36]. For learners, a competence model is beneficial for progressively accomplishing more complex educational activities in order to develop the competencies needed to discover and create entrepreneurial opportunities [37]. Learners have also been found to learn more if teaching is based on tangible learning outcomes and feedback [38]. For education program managers and curriculum developers, a systematic EE framework allows considering applying the gradual development of entrepreneurship competence and embedding entrepreneurial competencies for intended learning outcomes in the early phase of curricular development [36]. For policymakers, the competence model helps to embed EE learning outcomes in the wider education system. Moreover, a competence model can be considered as the “glue” between the different elements of entrepreneurship competence, including the aims and stages of EE, each successive stage having slightly different but more advanced outcomes regarding the same concepts and elements. Thus, establishing a competence model appears to have a significant importance in systemizing the process of *how*, *what*, and *when* a certain aspect of EE should be taught.

However, competence models are uncommon in the existing literature, and there are an insufficient number of sources critically analyzing current competence models [4]. There is also limited empirical evidence regarding the capability of learners at different education levels, in the EE context [6, 39]. A significant limitation is the lack of efficient assessment methods to measure the impact of EE on entrepreneurial competencies, and thus systematic applications of EE would contribute to mitigating this issue [39, 40]. Also, there is still significant doubt as to what EE learning outcomes and subsequent application methods are most effective and relevant. Hence, to solve the problems arising from the differing elements of EE, a competence model is suggested to serve as a valid solution that would make EE more tangible, measurable, and effective [4, 34–36, 39, 41, 42].

One of the main barriers to establishing a shared understanding of EE has been the differing approach to the term *entrepreneurship*. Does it represent the process of starting and managing a business with scarce resources and changing market conditions [1, 4, 42]? Or does it represent solving social issues and improving life as a whole through various value creation processes by an enterprising person [6, 37, 39]? The former regards a person who seeks to establish his/her own business, and the latter someone who explores and exploits opportunities and possesses entrepreneurial competencies that can be used to create value for others in all fields of life [37, 39, 43]. Based on the previous line of thought, the starting and managing of a business represent the “narrow approach” to entrepreneurship, while exploring and exploiting opportunities with a set of entrepreneurial competencies and supporting value creation in all fields of life represent the “broad approach” to entrepreneurship [39, 42, 44, 45]. The two approaches, narrow and broad, allow setting two different aims for EE: (1) supporting the management of a new business and (2) developing innovative, creative, and enterprising individuals [46]. In this article, we define entrepreneurship as a process where value (economic, social,

and cultural) is created through entrepreneurial actions (opportunity identification, evaluation, and pursuit). Based on this definition, EE can be considered as a learning process that supports the development of entrepreneurship competence, that is, identifying, evaluating, and pursuing opportunities to create economic, social, and cultural value for others. The narrow approach to EE, in this case, focuses on developing entrepreneurial competencies related to value creation concerning creating, managing, and scaling a venture.

Based on the literature, entrepreneurial competencies relevant to the narrow approach include understanding business processes, analyzing the market, developing products, identifying and allocating suitable resources, choosing an appropriate sales strategy, financing the business effectively, and many other aspects [39, 47]. Entrepreneurial competencies suited to the broad approach include sense of initiative, creativity, risk-taking, negotiation skills, the ability to work individually and in teams, leadership skills, ambition, and other aspects [36, 39, 47–49]. Entrepreneurial competencies relevant to the broad approach are targeted at developing and supporting an entrepreneurial mindset in order for people to create different forms of value in different fields of life [36, 37, 48]. These competencies also help learners to succeed in business programs and other complex entrepreneurial assignments that require using entrepreneurial competencies related to the narrow approach [36]. Competencies applicable to the narrow approach can thus best be developed in the presence of an already established set of entrepreneurial competencies of the broad approach [39, 47]. Therefore, in light of the possible gradual development in entrepreneurship competence, learning outcomes should be set appropriately and considered potential target groups. This means considering many variables of the competence development process, which makes assessing and measuring competence development an extremely complex undertaking.

Also, it has been stated that, to maximize the effectiveness of the EE competence models, it is best to start with EE as early as possible, starting with establishing the foundation for entrepreneurial competencies, which is crucial for learners to later on have the prerequisites necessary to choose whether to pursue becoming an entrepreneur in the future [4, 46]. At the higher levels of education, where learners are closer to graduating and finding a job or creating a business, it is considered more relevant for the focus to be on value creation in the narrow approach [4, 39, 46].

In sum, after the literature review and considering the overarching question of how systematic competence development models are constructed and conceptualized in EE, we arrived at the following research questions as a basis for the analysis:

- (1) What are the aim, definitions, and approach taken for constructing the EE competence models?
- (2) How do the EE competence models relate to specific educational contexts?
- (3) How and when are competence levels expected to advance in different education systems?
- (4) What are the entrepreneurial competencies listed in the EE competence models?

Finding answers to the established research questions helps to increase the understanding of the critical aspects of entrepreneurship competence that support achieving well-balanced and systematic competence descriptions in EE competence models.

3. Methodology

The process of our analysis started with finding and examining the existing competence models in the literature. The criteria for selecting the competence models for analysis were the following: (1) the competence models have to present a form of entrepreneurship competence development for different levels; (2) some form of gradual development of the competence has to be exhibited; (3) the competence model has to be designed on a national or regional scale; and (4) the competence model has to contribute significantly to the existing understanding of systematic EE.

We found numerous attempts to conceptualize entrepreneurship competence, but most of the models were designed in a specific context that could not be generalized to the broader educational context, did not present the aspect of gradual development, or were not focused on the learner's development per se. A few good examples of well-established models in their particular contexts are the action-based and unified progression models proposed by Lackéus [4, 42] and the conceptual framework (triadic model) for entrepreneurial learning by Rae [50].

Based on the established selection criteria, we arrived at five EE competence models for analysis. These models were (1) the model offered by Gibb [39] (referred to as the “UK model”), (2) the model known as *National Content Standard for Entrepreneurship Education* (referred to as the “USA model”) [34], (3) the Danish model [40], (4) the Norden model (referred to as the “Nordic model”) [41], and (5) the EntreComp model (referred to as the “EU model”) [37], which were, respectively, created in and for the contexts of the United Kingdom, the United States of America, Denmark, Scandinavian and Nordic countries (Denmark, Sweden, Norway, Finland, Iceland, Faroe Islands, and Åland Islands), and Europe.

To answer the first research question, we conducted a comparative analysis by comparing the aims, the definitions, and the approaches to constructing the five competence models and examining how these relate to our definition of EE as described earlier.

The second research question was answered by examining the background of the competence models in order to understand the educational contexts for which they were constructed. This mainly included observing various aspects of the educational context, such as whether models were established on existing parts of the education system, for whom the models were tailored, and how various aspects might affect their applicability in specific contexts.

For the third research question, we compared how the gradual development of competencies is established by finding answers to how and with what timeline the progression is described in the models.

We answered the fourth research question in two phases. Firstly, we examined and matched the competencies of all five models to see which entrepreneurial competencies all of the analyzed models have in common and what the different models focus on. Secondly, as it is not explicitly described how the competencies were chosen for the five models, we aimed to understand what components comprise the entrepreneurship competence described in the models. For this analysis, we organized the competencies in light of the Le Deist and Winterton [17] classification of four dimensions: (1) conceptual competencies related to an occupation, (2) conceptual competencies related to an individual, (3) operational competencies related to an occupation, and (4) operational competencies related to an individual. This categorization and comparison largely confirmed the results of the analysis for the first three research questions, since the comparison of entrepreneurial competencies made the alignment between the aims and definitions more explicit.

4. Results and Discussion of the Analysis

The overall aim of all chosen EE competence models is to gain a common understanding of EE and set learning outcomes for different education levels and to establish a bridge between educational policies, real-life practices, curricular developments, businesses, and other EE stakeholders. Still, the common understanding of EE and its aims and learning outcomes differ depending on the educational context, learners' capabilities at different education stages, national strategies in other related policy areas (e.g., employment and innovation), and many other aspects.

All analyzed models provided descriptions of the competencies within the frame of formal, informal, and non-formal education settings, leaving out preschool. However, as referred to earlier in this study, to make full use of the competence models, it is most effective to start developing entrepreneurship competence as early as possible, preferably even before the general education begins [4, 46].

The varying ways in which the core competence areas are defined in different competence models refer to the different interpretations of EE and its main aims, as well as defining which are best suited to the context in which they were created. Some of the differences between models might be due to, for instance, whether EE is taught as a stand-alone subject or its learning outcomes are embedded with other subjects, or due to the background of the education systems and prevailing skills of learners. To exemplify this further, the United States might have a stronger business approach mainly because of its model's specific focus and aim, but also because of their long history of developing EE [34]. Also, according to Le Deist and Winterton [17], the approaches of the competence models in the USA have been mostly behavioral rather than holistic. In Europe, the first implication of the significance of EE on policy (*European Green Paper on Entrepreneurship in Europe*) was published in 2003 [5]. Hence, in Europe, the systematic development of EE is a more recent phenomenon and the competence models developed are suited to educational purposes for wider audiences, aligning with the multidimensional holistic

approach. Also, transferable competencies are more in focus than pure business orientation [5]. This coincides with the ideas of Gibb [37, 39], who found that more functional and behavioral business-related competencies could be developed in the presence of an already established set of broader, holistic entrepreneurial competencies. The latter indicates that educational context and background as well as the existing foundation of learners' entrepreneurial competencies should be considered when deciding on the core competence areas and the broader aims of EE. In addition, this means considering many variables in the competence development process, which makes assessing and measuring competence development an extremely complex undertaking.

4.1. What Are the Aim, Definitions, and Approach Taken for Constructing the EE Competence Models? An overview of the aims and definitions pertaining to the EE competence models is highlighted in Table 1.

The aim and definition of the UK model are made explicit. The model seems to blend a functional approach with holistic elements (mainly focusing on the ability to perform in a specific profession) of the entrepreneurial competencies outlined in the classification of conceptualized competencies by Le Deist and Winterton [17]. The learning orientation of EE is toward the *broad* approach of EE in primary education and is changing gradually toward the *narrow* approach in secondary education and more explicitly in vocational and higher education, highlighting the focus of the aims and outcomes that should be considered at the different education levels. Similarly to the EE definition chosen for this study earlier, EE is considered as a process that supports developing entrepreneurship competence, although the emphasis is not explicitly on opportunity identification and pursuit but also on innovation and effectiveness. However, how the competencies of EE should be gradually developed throughout the education levels remains implicit in this competence model (see Table 4). Also, learning outcomes across the education levels in the UK are considered to be more narrow and outcome-oriented [22], thus confirming the main focus on EE in the UK, as shown in Table 1.

In the USA model, the aim and definition refer to the behavioral and functional approach in conceptualizing competence as it strives to develop the abilities to perform and improve the effective interaction of individuals with their environment (see more in Table 4). Direct reference is made to developing criteria for entrepreneurship programs. The descriptions of entrepreneurial competencies refer to the narrow approach of EE, but few skills under the core competence area of "entrepreneurial traits and behaviors" indicate the broad approach of elements such as demonstrating honesty and integrity, valuing diversity, or setting personal goals, to name a few [34]. While focusing on preparing learners to succeed in business, which is the process of EE, the pursuit of opportunities and the creation of value are not explicitly described in the EE definition.

The aim and definition of the Danish model are aligned with the broad approach to EE, and the model is constructed as a holistic competence model. The model addresses four dimensions that, depending on the context, refer to (1) the

TABLE 1: Description of the aims and definitions of the chosen EE competence models.

Model	Aim	EE definition
UK	Provide a competence model for potential EE learning outcomes for each level of the education system, and provide recommendations for when EE should be introduced to the curriculum and how it might be integrated.	EE is the process that supports the development of “behaviors, skills, and attributes that can be applied individually and/or collectively to help individuals and organizations of all kinds to create, cope with, and enjoy change and innovation involving higher levels of uncertainty and complexity as a means of achieving personal fulfillment and organizations’ effectiveness.” [39, p. 106]
USA	Design a tool kit of standards and performance indicators for developing a curriculum for entrepreneurship programs supporting a lifelong learning process.	EE is a lifelong learning process that “prepares youth and adults to succeed in an entrepreneurial economy.” [34, p. 1-2]
Danish	Provide a framework for EE that aligns the overall purpose of EE with learning outcomes, teaching content, and progression throughout the educational system. Also help to deliver feedback, evaluation, and assessment to support learning.	EE is the set of “content, methods, and activities that support the development of motivation, competence, and experience that make it possible to implement, manage, and participate in value-added processes.” [40, p. 7]
Nordic	Clarify competencies and EE learning outcomes, and provide a tool for teachers and practitioners to plan learning outcomes and pedagogy for EE. Function as a reference point for decision makers who draw up legislation and frameworks related to EE, and support school leaders in providing relevant structures, environments, and EE development.	EE refers to “teaching that supports the development of entrepreneurial resources, competencies, and experiences.” [41, p. 7]
EU	Identify key components of entrepreneurship in terms of competencies, establish a shared conceptual model that any initiative aiming to foster entrepreneurial learning can refer to, and plan learning outcomes suggesting what European citizens should know, understand, and be capable of to demonstrate a certain level of proficiency in entrepreneurship.	EE, specifically, is a process that supports the development of entrepreneurship competence, which implies “acting on opportunities and ideas and transforming them into financial, cultural, and/or social value for others.” [37, p. 7]

Source. UK model [39], USA model [34], Danish model [40], Nordic model [41], and EU model [37].

learner’s competence preparedness, (2) the framework for learning goals, (3) the teaching content, and/or (4) the overall educational planning (see Table 4) [40]. The authors of the Danish model have defined EE not as a process like in the previous models, but as a set of methods, content, and activities that support the development of competencies relevant to value creation. Still, the competencies described in the Danish model imply that EE is interpreted as a process therein. Hence, we analyzed the model accordingly. The categorization of the competencies is consistent for all education levels and the gradual development of the competencies is explicitly systematic [40].

In the Nordic model, the aim and definition are clearly focusing on giving teachers and practitioners a tool by providing them with information on learning outcomes and pedagogical suggestions. The authors of the model have defined EE as teaching that supports entrepreneurship competence development, pointing to the process of creating value and pursuing opportunities rather implicitly. The model highlights the broad approach to EE, and the categorization of the core competencies is similar to that in the Danish model in regard to their content but differs in the names given the core competencies. The model is holistic and the gradual development of entrepreneurship competence is exhibited

clearly throughout the education levels that are considered in the model. This model, while created in the context of Scandinavian and Nordic countries, is seen as the extension of education reforms that have already occurred, and it aims to give a more tangible form to EE elements that already exist in various subjects within the education system [41].

The aim and definition of the EU model are aligned with the criteria that we found in the literature. In other words, the aim and definition of the competence model are made explicit and are aligned with the holistic approach. The EU model, hence, provides a better understanding of systematic EE by combining learning outcomes, progression, and elements that could be adapted to various target groups and contexts. In this model, EE is defined as a process that supports the development of entrepreneurship competence, proposing pursuing opportunities to create various sorts of value. Thus, among the five models, it is the most explicit one with reference to the opportunity pursuit process and value creation in various fields. Moreover, the model in question provides the closest match with the core criteria proposed by competence development literature in general [17, 20, 22].

Only the UK and USA models include organization and/or economy in their definition, also referring to the *narrow* approach. Value creation has been emphasized in Danish

TABLE 2: Description of when and/or how expected competence levels advance in the EE competence models.

Model	Educational context and focus of the models for gradual development	Notes
UK	(1) Primary education: <i>child-centered</i> (2) Secondary education: <i>subject-centered</i> (3) Vocational education: <i>skill-centered</i> (4) Higher education: <i>discipline-centered</i>	(1) Learners are approached on an individual basis. <i>Foundation of entrepreneurial competencies</i> is laid. (2) Subjects connected with tasks requiring entrepreneurial competencies. (3) Specific skills of learners related to business creation skills. <i>Supporting learners to become self-employed.</i> (4) Additionally, learners obtain in-depth <i>understanding of diverse aspects of entrepreneurship within their discipline.</i>
USA	(1) Basics (2) Competence awareness (3) Creative applications (4) Start-up (5) Growth	The first three are categorized as <i>job training</i> and the last two as <i>job experience</i> . The first two stages are for gaining an introductory understanding of entrepreneurship and enhancing <i>basic entrepreneurial competencies</i> , the 3rd stage is about gaining initial <i>practical experiences related to entrepreneurship</i> , and the last two stages are focused on evolving skills in <i>managing and expanding a business</i> .
Danish	(1) Compulsory schooling (2) Vocational education (3) Upper secondary education (4) Profession-based tertiary education (5) Degree course	All core competencies are embedded in the core subject and curriculum, dividing the four competencies by skills and knowledge. The focus is on ensuring that the level of competence in core subjects gradually increases throughout the education system regarding innovation and entrepreneurial processes.
Nordic	(1) Year 3: early years (2) Year 6: intermediate years (3) Year 9: leaving school	At all three stages, entrepreneurial competencies represent the ultimate goal and intended learning outcomes. All competencies other than personal resources are divided by skills and knowledge at all levels.
EU	4 standard qualification levels further split into 8 sublevels (1) Foundation: discover & explore (2) Intermediate: experiment & dare (3) Advanced: improve & reinforce (4) Expert: expand & transform	The gradual development of entrepreneurship competence is based on 8 nonlinear proficiency levels. Value creation at all levels: (1) foundation: external support, (2) intermediate: increasing autonomy, (3) advanced: responsibility to transform ideas into action, (4) expert: driving information, innovation, and growth (reference domain). Note that when the first 3 levels can be applied to all citizens, the expert level is more context-dependent.

Source. UK model [39], USA model [34], Danish model [40], Nordic model [41], and EU model [37].

and EU models, although the former includes the methods, content, and activities necessary in EE while the latter focuses on the broader aim of EE, thus leaving more room for interpretation of the EE concept. The Nordic model focuses on improving entrepreneurial resources, competencies, and experiences. This focus could be due to the model's emphasis on early education levels, teaching methods, and a specific target group, that is, teachers and practitioners (see Table 2).

The definitions for EE used in all of the examined models emphasize the importance of the process of opportunity pursuit and value creation: Danish and Nordic models more implicitly and the UK, USA and EU models more explicitly. Therefore, the process component is a crucial aspect of EE and should thus be made explicit and aligned with the aim, definitions, and approach of an EE competence model.

In general, the holistic approach seems to be the most dominant in conceptualizations of the most recent competence models, especially in those focusing on developing an

entrepreneurial mindset in the broad sense (e.g., Danish, Nordic and EU models). Also, the holistic view is likely to be used more in the early education stages. Behavioral and functional competencies seem to be included more so in the UK and USA models, where competencies are more individually focused (and thus easier to understand and develop).

The common aim of all examined competence models is to establish a set of learning outcomes for the different education levels and thus to provide EE stakeholders with a clear understanding of EE. Specifically, the five examined competence models aim to create a bridge between education policies (including policymakers), real-life practices (including teachers), curricular development (including school leaders and educational institutions), businesses, and other relevant stakeholders.

4.2. How Do the EE Competence Models Relate to Specific Educational Contexts? As we found earlier, the specific context

common to all the models is EE. Still, even within EE, the greater context of competence models can vary depending on what the aim of the competence model is and how the EE is defined.

As seen in Table 1, every competence model is established with a specific education context in mind. The UK model was initially established based on the learning outcomes of UK graduates, and thus it indicates that the earlier successive competence development stages (in this case, education levels and types) are targeted to support achieving the main aim at the graduate level [39].

The USA model demonstrates a different approach, since it is meant to standardize entrepreneurship programs and be used as a reference point in the development of the entrepreneurship program curriculum [34]. When compared to the other four EE competence models, the USA model has a more business-focused approach and it provides a more detailed and technical description of the learning outcomes, making it difficult to be matched with other models [5, 34].

The Danish and Nordic models are designed for an overarching context: the Nordic countries. Nonetheless, the Nordic model was created to be adapted to the already existing, liberated, and reformed education system and focuses on developing learners' abilities in how to make the best use of that freedom and liberty [41]. Also, the Nordic model suggests not to teach entrepreneurship as an academic subject per se but rather guides EE stakeholders to embed EE in the existing subjects. It does this by providing a more tangible form of the EE elements that already exist in various subjects within the education system and that are aligned with the broad holistic approach [41].

The EU model was created for the context of the EU and its member states, and as such it is a competence model that could be used and applied in both broader and more specific learning contexts ranging from formal education and training to workplace and informal and nonformal learning. The competencies that are listed in this model are clearly context-bound and necessitate taking action and responsibility, as well as being focused on achieving goals (see Table 4). It seems that, in the construction of the EU model, a reasonable balance between personal and social factors affecting performance was aimed at. The main aspects of the whole spectrum of the profession of an entrepreneur seem to have been considered. The strength of this model is the action aspect that is integrated in its description as a value creation process.

In sum, a competence model should be suited to the education system's context it is designed for and feature a detailed description and sufficient suggestions for its everyday practical application. When the competence model is presented in combination with insufficient instructions and guidance, its proper application may be easy to overlook. Also, context-related aspects of the examined competence models are presented rather generally and this makes adapting the models to a particular context a complex undertaking. We therefore suggest making decisions related to applying the models in specific contexts more explicit.

4.3. How and When Are Competence Levels Expected to Advance in Different Education Systems? It is important to have an overview of when and how the expected competence levels are expected to advance in different education systems (see more in Table 2).

As a result of our analysis, we identified three different ways in which the analyzed competence models have described their systematic development of entrepreneurial competencies: (1) specific education levels and types (Nordic, Danish, and UK models); (2) job- and business-related competence levels (USA model); and (3) nonlinear proficiency levels (EU model).

For specific education levels and types, the degree of the sophistication of competence development in EE is built along a similar timeframe in these three types of models, but they differ in regard to the education levels and types that the EE is to cover. For example, while the Nordic model focuses on the first nine years of general education in three stages, the Danish model covers the entire education spectrum across four levels and one type of education (vocational education). The UK model highlights three stages (primary, secondary, and higher education) plus vocational education, and it ties each education level and type to a specific learning orientation (i.e., child-, subject-, skills-, and discipline-centered). The USA model associates education stages with learner-centered themes (job- and business-related competence levels) that gradually become more complex but does not directly link these themes to different education levels since this is not the primary aim of this competence model [34]. Yet, the authors of the USA model suggest that the "basic" stage should be introduced in primary, middle, or high school and that the timing of the subsequent stages should be established depending on when the "basic" stage is introduced. The EU model is based on eight proficiency levels that establish a reference point for the development of competencies and provide a structure for users of the model to understand learning outcomes. Understanding and enhancing the proficiency levels can make applying the model more effective so as to achieve a greater impact through value-creating activities [37]. However, the model should be used with caution since the eight proficiency levels that are used to describe the competence development are not necessarily directly related to specific education levels but rather apply to all kinds of learning contexts. Connecting the outcomes shown in Table 2 with those in Tables 1 and 4, it is fair to say that the observed competence models are related to the EE contexts for which they were created.

Based on the analysis for the three preceding research questions, we suggest that when the main aim and definition of EE as well as the competence development stages are defined and developed in light of their education context, the application of the model within the education system is more likely to be accepted. This includes appropriately establishing the progression of the entrepreneurial competencies by considering the current and prospective competence levels of the learners.

4.4. What Are the Entrepreneurial Competencies Listed in the EE Competence Models? As highlighted in Table 5, we found

19 common entrepreneurial competencies described in all five models, such as responsibility and creativity, opportunity recognition and exploitation, teamwork, and management skills in a business context. This analysis is valuable, since it helps to map the most important competencies related to entrepreneurship competence.

However, a number of common competencies were featured in only two, three, or four of the five models (see Table 5). It is noteworthy that while the Danish, Nordic, EU and UK models share similar, comparable learning outcomes, most of the competencies in the USA model—due to its main aim—are too detailed and technical to be matched with other competence models (e.g., the abilities to “implement workplace regulations,” “plan follow-up strategies in selling,” and “explain the nature of the Consumer Price Index” could not be matched with competencies of other models). We therefore compared and confirmed the competencies that matched at least two of the five models (see Table 5). The abilities to “reflect” and to “believe in one’s efficacy” were featured in the three most recent competence models, that is, the Danish, Nordic, and EU models. This indicates the growing importance of attitudinal (mindset-related), metacognitive, and transferable competencies and lifelong learning for EE development. The list of entrepreneurial competencies that are most important regarding entrepreneurship competence is likely to be phrased slightly differently when using different classification methods proposed by different researchers. Still, based on our findings, even when using other terms and classifications, such a list should remain similar to the 19 mapped competencies that are described in all five models (plus prospectively those that are described in four models, as shown in Table 5).

Again, note that how such competencies were chosen was not explicitly described in the models. Consequently, our comparison of competencies can make only a marginal contribution to the understanding of how to systematize the established list of entrepreneurial competencies. In pursuit of understanding how the systematic development of entrepreneurship competence has been conceptualized, it is hence crucial to understand which components belong to entrepreneurship competence. For this reason, we organized the competencies using Le Deist and Winterton’s [17] classification of conceptualizing a competence framework in order to create an overview instrument for combining different components of competence (e.g., to set a focus on planning learning outcomes). The results of this analysis phase are highlighted in Table 3. Categorizing competencies according to conceptual versus operational skills and occupational versus personal contexts helps in trying to understand the balance between the competencies and other characteristics of the entrepreneurship competence. Note that this list of entrepreneurial competencies is a result of an analysis and is not a systematically constructed entrepreneurship competence model. However, it helps one to understand what the balance ideally could be and what competencies are essential for designing an effective entrepreneurship competence model. Dividing conceptual versus operational skills also helps one to understand what theoretical entrepreneurship

concepts should be addressed in developing entrepreneurship competence. Knowing what or for whom conceptual competencies should be operationalized and put into action helps in choosing appropriate processes and instructions for educational interventions. Also, attitude and other aspects that should be supported in competence development can be much more systematically supported through this analysis, rather than solely basing such aspects on a specific competence model. Depending on the context within which competence models are to be created and applied, having this map of competencies can assist educators and policymakers in deciding where to direct emphasis in entrepreneurship competence development.

When looking at and comparing the lists of conceptual versus operational competencies, some inconsistencies or questions may arise; for example, “what conceptual knowledge would be relevant for controlling costs?” or “what conceptual knowledge is needed to handle big data or to validate ideas?” and so on. Considering that this list of competencies is a summary of competencies from different competence models, we point this out to challenge the thought process of constructing competence rather than evaluating the balance between various competencies.

Every studied competence model has its own aim and focus, which implies that all competence models describe an individual set of entrepreneurial competencies. On the one hand, this could imply that specific competencies are more likely to be developed in some education systems due to the surrounding educational, individual, and policy-level background and situation. On the other hand, the varying competence elements in different competence models might again confirm the uncertainty regarding which competencies are more prone to be effective at which educational stage. Also, it can be said that the goals of the entrepreneurial competencies developed in the frameworks of all the examined competence models reflect the desired outcomes of national and/or regional EE strategies. The latter suggests intentionally aligning entrepreneurial competencies with the goals of the EE strategy.

Nevertheless, we found little information and no clear evidence on how the described learning outcomes and competence levels in the examined competence models were formed. The (entrepreneurial) capability of learners at various education stages should thus be observed more closely in order to obtain more empirical proof of the suitability of chosen learning goals [39].

5. Main Concluding Points

The aim of the present study was to understand how different EE competence models describe and conceptualize the systematic progress of developing entrepreneurship competence up the education ladder. In sum, we can conclude that the structure and focus of existing EE competence models vary significantly. However, the feature common to all five analyzed EE competence models was the focus on developing competencies related to opportunity pursuit and value

TABLE 3: Division of competencies based on Le Deist and Winterton [17] classification of entrepreneurial competencies stated in the EE competence models and in the literature.

	Competencies related to the occupation (entrepreneurship)	Competencies related to the individual (entrepreneurial person/entrepreneur)
<p>Conceptual <i>Occupational:</i> cognitive knowledge and understanding <i>Individual:</i> effectiveness, metacompetence, including learning-to-learn</p>	<p>(i) Project management and business planning (ii) Defining an opportunity (iii) Demonstrating creativity, problem solving, and systematic thinking (iv) Different forms of idea generation (v) Awareness of globalization and the consequences (vi) Economic and financial concepts (vii) Demonstrating cross-functional awareness (viii) Understanding taxation</p>	<p>(i) Demonstrating commitment (ii) Seeing and acting strategically according to the bigger picture (vision) (iii) Identifying personal strengths and weaknesses and designing personal development plans to overcome weaknesses and develop strengths (pursuing self-development) (iv) Learning from the experience: able to monitor and evaluate processes and use them in the learning process (v) Learning-to-learn: able to identify opportunities for self-improvement within an organization and beyond (vi) Ability to learn from failure and reflect on your own failures (vii) Showing emotional self-control</p>
<p>Operational <i>Occupational:</i> functional, psychomotor, and applied skills <i>Individual:</i> social competence, including behaviors and attitudes</p>	<p>(i) Taking action (ii) Negotiating and persuading (iii) Planning, developing and executing, and sticking to a project management plan and a sustainable business plan/strategy (iv) Controlling costs (v) Challenging basic assumptions with data (vi) Identifying, testing, evaluating, and exploiting (business) opportunities (vii) Gathering, analyzing, and evaluating information (viii) Organizing constructive discussions (ix) Managing a conflict (x) Applying effective time management for oneself and in teams (xi) Organizing constructive discussions (xii) Designing value-creating processes (xiii) Explaining concepts and opinions (xiv) Presenting and public speaking (xv) Writing and reporting skills (xvi) Structuring idea generation processes (xvii) Applying technical (subject-related) expertise (xviii) Ability to get support (know-how) from external sources (xix) Using economic and financial concepts to assess the financial health of an initiative (xx) Managing risks by using strategies to reduce risks (xix) Expanding a network effectively and meaningfully (xxii) Identifying needed resources and allocating them efficiently to achieve goals (resource management) (xxiii) Protecting ideas (intellectual property rights) (xxiv) Monitoring the progress (xxv) Using sensory concepts and creativity in relation to academic knowledge (xxvi) Delivering results and meeting customer expectations (e.g., monitor and maintain quality and productivity) (xxvii) Identifying and recruiting talent (xxviii) Using creativity in all phases of the project (xxix) Visualizing knowledge</p>	<p>(i) Adapting to changes in the environment and context (ii) Dealing with ambiguity (iii) Coping with pressure (iv) Maintaining a positive outlook and working enthusiastically (v) Helping others to identify their strengths and weaknesses (vi) Encouraging others to take action (vii) Seeking and introducing change (viii) Leading and supervising (providing direction and supervising, coaching, delegating, empowering, motivating, and developing others) (ix) Acting with confidence (x) Accepting and supporting diversity in a team and utilizing it (xi) Listening (xii) Appealing to emotions (xiii) Working together with others (xiv) Encouraging and supporting organizational learning (xv) Managing interdependency (xvi) Taking responsibility (xvii) Making an impact (xviii) Making stakeholders take responsibility (xix) Communicating (xx) Upholding ethics and values (xxi) Acting with integrity (xxii) Showing social and environmental responsibility</p>

Sources. UK model [39], USA model [34], Danish model [40], Nordic model [41], EU model [37], and Le Deist and Winterton [17].

TABLE 4: Core competence areas and stated subcompetencies of analyzed EE competence models.

	Core competencies together with listed subcompetencies and traits	Notes
UK model	<p><i>Areas that represent the broad approach</i> <i>Develop entrepreneurial competencies:</i> opportunity seeking, initiative taking, autonomy, negotiating, risk-taking, intuitive decision making, strategic orientation <i>Experience entrepreneurial life:</i> problem solving, decision making under pressure, learning by doing, coping with uncertainty <i>Understand entrepreneurial values:</i> independence, ownership, trust, self-belief, action orientation <i>Feel motivated to begin an entrepreneurial career:</i> knowing the benefits of being an entrepreneur and understanding the role in society <i>Areas that represent the narrow approach</i> <i>Key business development how-tos:</i> planning, researching, developing, marketing, management, finances, regulatory <i>Networking capacity:</i> knowledge of developing, holding, maximizing the value of partnerships meaningfully <i>Mindset and perseverance to carry out new venture creation</i></p>	Competence areas of the UK model are described rather broadly and are not elaborated as in the other models presented in this article
USA model	<p><i>Area that represents the broad approach</i> <i>Entrepreneurial skills:</i> processes and traits associated with entrepreneurial success (entrepreneurial processes and traits) <i>Areas that represent the narrow approach:</i> <i>Ready skills:</i> basic business knowledge and skills that are prerequisites for becoming a successful entrepreneur (business foundations, communication & digital skills, economics, financial literacy, professional development) <i>Business functions:</i> business activities performed by entrepreneurs in managing a business (financial, human resources, information, marketing, operations, risk and strategic management)</p>	Under 3 sections, 15 major entrepreneurial competencies are presented as learning outcomes
Danish model	<p><i>Action:</i> ability and motivation to implement value-creating initiatives and realize them through cooperation, networking, partnerships <i>Creativity:</i> ability to recognize and create ideas and opportunities <i>Outward orientation:</i> understand surrounding opportunities/needs and their dynamic interaction with one's own capacity and ability to adapt to a specific setting in order to create social, cultural, and/or financial value <i>Attitude:</i> personal mindset to meet challenges and have faith in one's own ability to act in the world and realize dreams and plans</p>	The 4 listed aspects are originally described as dimensions that are interconnected, complementary, and suggested to be embedded in the core curriculum
Nordic model	<p><i>Action:</i> pupils' ability to take tangible action (plan, structure, execute, collaborate, communicate, manage finances and resources) <i>Creativity:</i> ability to see, sense, create opportunities, solve problems, think in different ways, experiment with different forms of knowledge <i>External competencies:</i> knowledge about, understanding of, interaction with culture, the surrounding world, external parties <i>Personal resources:</i> subjective belief and trust in how one can act in the world, resources to facilitate this, how dreams/visions can be realized</p>	Personal resources (e.g., perseverance) are highlighted in a different category as they are complex to teach, test, and assess. However, they are crucial to support mindset development

TABLE 4: Continued.

	Core competencies together with listed subcompetencies and traits	Notes
EU model	<p><i>Ideas and opportunities:</i> spotting opportunities, creativity, vision, valuing ideas, ethical and sustainable thinking</p> <p><i>Resources:</i> self-awareness and self-efficacy, motivation, perseverance, mobilizing resources, financial and economic literacy, mobilizing others</p> <p><i>Action:</i> taking initiative, planning and management, coping with uncertainty, ambiguity and risk, working with others, learning through experience</p>	<p>The model's 3 competence areas incorporate 15 subcompetencies that consist of 442 learning outcomes. All competencies can be achieved at different levels, not just the highest level is expected. All learning outcomes are tailored for both individuals and groups</p>

Source. UK model [39], USA model [34], Danish model [40], Nordic model [41], and EU model [37].

creation processes, which are critical and central aspects of entrepreneurial activities.

In the studied literature, the competence models were found to function as a backbone for the different approaches, aims, and stages of EE, and thus the models are considered to be important in systematizing the EE competence development process. We agree that the systematic application of competence development might help to create efficient methods of assessing the impact of EE on entrepreneurial competencies, an issue that should be observed more closely in future research on entrepreneurial competencies [39, 40].

Our present analysis confirms that one EE competence model is unlikely to fit the needs and aims of another education system when simply copied and pasted. It can therefore be said that competence models should be carefully focused on those learning outcomes that are most relevant to a learner's environment, background, existing knowledge, and trends in their social and financial environment, as well as other aspects of their educational and local context.

The EE competence model is suggested to be a valid solution for the gradual development of competencies and differing elements of EE (e.g., learning outcomes and pedagogical approaches) pertaining to different types and stages of education and thus makes EE more tangible, measurable, and effective [4, 34–36, 39, 41, 42]. We do agree that generic competence models contribute to this knowledge and that different competence models contribute to difference aspects of knowledge regarding competence development in EE. Also, there is a tendency for EE competence models to focus on certain core competence areas, learning outcomes, and target groups depending on the educational context and external environment.

To be a valid basis for EE measurement instruments, the competence models' construction and conceptualization principles should be more consistent across the European Union member states. Furthermore, evidence of how the described competence models (e.g., competence levels and learning outcomes) are established helps to understand the context of the established competence models.

The analysis of this study maps the core components of entrepreneurship competence and makes the design of the analyzed competence models more explicit. Understanding

these core components provides a grasp of what competencies are essential for designing an effective EE competence model and supports achieving well-balanced and systematic competence descriptions in EE competence models. Also, knowing which competencies should be operationalized for whom helps in choosing suitable processes and instructions for educational interventions. Hopefully this understanding can be translated into a more systematic and transparent conceptualization and gradual development of entrepreneurship competence. Our study provides a reference point for designing systematic EE learning outcomes that could help learners to enhance their entrepreneurship competence at all education levels. Also, this study helps to gain a clearer understanding of how EE learning outcomes can be achieved systematically, and it therefore contributes to the work of and can be useful for educators, school boards, policymakers, local municipalities, researchers in the field of EE, and other relevant stakeholders.

We found no clear evidence for how the described learning outcomes and competence levels in observed competence models are established: a limitation that can be overcome by making this process explicit when designing EE competence models in future. Additionally, to the best of our knowledge, no thorough empirical research has been conducted on the effectiveness of the competence models other than for the USA model, as described earlier [51]. Also, as the Nordic and Danish models are presently still being tested and developed on an ongoing basis, it is still too early to engage in more extensive generalizations and conclusions on what works best in developing entrepreneurial competencies as such. The EU model has thus far also been applied to and tested in real settings to only a limited extent, and thus more refinement is needed based on the feedback from practitioners and end users [37]. Hence, it is difficult to say which variation of the core competence areas and which description of their gradual development are most efficient for most effectively enhancing particular entrepreneurial competencies.

There is no simple way to observe the progress and development processes of competencies. What is common is that the presented models highlight an "optimal set" of expected competencies for a specific educational stage. The comparison of EE learning models and related aspects

TABLE 5: Categorization of common and differing competencies between all five observed EE competence models.

Competencies	Models
Identify, define, test (validate), and exploit opportunities (e.g., through trends or cultural, social, and economic conditions, personal resources)	EU, Nordic, Danish, UK, USA
Gain understanding of economic and financial concepts and apply it to assess the financial health of initiatives	EU, Nordic, Danish, UK, USA
Ability to communicate effectively: constructive discussions; making stakeholders take responsibility, etc.; ability to use plan as a relationship management instrument	EU, Nordic, Danish, UK, USA
Take action and encourage others to do the same	EU, Nordic, Danish, UK, USA
Plan and organize: develop, execute, and stick to a project management plan	EU, Nordic, Danish, UK, USA
Work together with others (by independently contributing to a vision); managing interdependency	EU, Nordic, Danish, UK, USA
Expand your network effectively and meaningfully; can see all activities in terms of networks of know-how	EU, Nordic, Danish, UK, USA
Be flexible and adapt to changes: use results of monitoring to adjust the vision, aims, priorities, and activities; communicate effectively regarding reasons for changes and adjustments; willingness to change in relation to existing perceptions and habits	EU, Nordic, Danish, UK, USA
Manage risk: use strategies to reduce risks	EU, Nordic, Danish, UK, USA
Accept and support diversity in a team or organization; assess significance of own and others' cultural background and values	EU, Nordic, Danish, UK, USA
Develop sustainable business plans; describe business models, markets, and market conditions simply; can develop and defend a business plan and scale	EU, Nordic, Danish, UK, USA
Identify personal strengths and weaknesses (personal resources), help others to identify theirs; design personal and team development plans to overcome weaknesses and develop strengths	EU, Nordic, Danish, UK, USA
Develop effective time management for yourself (and the team)	EU, Nordic, Danish, UK, USA
Design value-creating processes	EU, Nordic, Danish, UK, USA
Learn from experience: ability to learn from monitoring and evaluating processes and to apply this to the organization's learning processes	EU, Nordic, Danish, UK, USA
Using creativity in all phases of the project (ideation, planning, and executing); structure idea generation processes and use different forms of idea generation; illustrate subject knowledge and creativity through sketches, models, and prototypes	EU, Nordic, Danish, UK, USA
Ability to see and act strategically according to the bigger picture (vision)	EU, Nordic, Danish, UK, USA
Awareness of societal structures, components, problems, and opportunities; understand cultural, social, and economic conditions in an international and global context; understand sources of complexity and uncertainty in a global context	EU, Nordic, Danish, UK, USA
Present results and projects to a specific target group; knowledge of presentation forms and tools; ability to defend a business plan and scale	EU, Nordic, Danish, UK, USA
Ability to manage resources (material and nonmaterial): identify needed resources and allocate them efficiently to achieve goals	EU, Nordic, Danish, UK
Analyze the context of opportunities	EU, Nordic, Danish, USA
Ability to create a budget for value-creating activities	EU, Nordic, Danish, USA
Take responsibility in value-creating activities and seizing opportunities	EU, Nordic, Danish, USA
Cope with uncertainty and ambiguity	EU, Nordic, Danish, UK
Assess and evaluate risk	EU, Nordic, Danish, USA
Work independently, helping others to do the same; praise the initiative of others; autonomy	EU, Nordic, Danish, UK
Define goals and design a strategy to achieve the goals	EU, Nordic, Danish, USA
Team up: ability to encourage people to work together and build an organization	EU, Nordic, Danish, USA
Use media effectively: define a communication strategy and improve support for the vision	EU, Nordic, Danish, USA
Define priorities	EU, Nordic, Danish, USA

TABLE 5: Continued.

Competencies	Models
Monitor your progress: develop performance indicators and create a data collection plan; analyze/evaluate own and others' activities using relevant criteria	EU, Nordic, Danish, USA
Awareness of globalization and consequences	EU, Nordic, Danish, USA
Maintain focus on interrupted tasks and projects over a long period; work persistently	EU, Nordic, Danish, UK
Believe in your ability to make things happen (efficacy) and learn from failures	EU, Nordic, Danish, UK
Awareness of working life and career opportunities; can relate to entrepreneurial world regarding a wide range of different social and employment contexts; understand relevance of entrepreneurial behaviors to a wide range of self-employment, employment, and social contexts; having role models relevant to field of study and context; can compare and contrast with expectations of employment career	EU, Nordic, UK, USA
Stay driven	EU, Nordic, UK, USA
Be determined and motivated (using all outcomes as temporary solutions) to achieve goals	EU, Nordic, UK, USA
Be accountable (responsible to all stakeholders)	EU, Nordic, UK, USA
Ability to find and manage funding; can identify financing needs and know where to go for resources	EU, Danish, UK, USA
Understand taxation and make smart decisions accordingly	EU, Danish, UK, USA
Develop emotional intelligence and emotional awareness; can apply all key aspects of emotional intelligence	EU, Danish, UK, USA
Respecting and promoting ethical and sustainable behavior; analyze and evaluate ethical issues in relation to personal, scientific, and global phenomena	EU, Danish, USA
Be resilient and assured that an individual/organization can make difficult decisions and deal with failure	EU, Nordic, UK
Ability to get support from outside the organization (information, know-how); understand sources of assistance and professional advice fully, including how to use them	EU, UK, USA
Listen actively to and understand end users from a wide range of resources	EU, UK, USA
Work using (academic) problem solving	EU, Nordic, USA
Ability to reflect on your own and help others to reflect on their achievements and temporary failures in order to develop	EU, Nordic, Danish
Use sensory concepts and creativity in relation to academic knowledge	EU, Nordic, Danish
Awareness of imagination and creativity in society; theories and concepts in innovation and entrepreneurship	EU, Nordic, Danish
Experiment with knowledge and academic subjects; experiment and improvise with subject knowledge and personal experiences	EU, Nordic, Danish
Knowledge of different types of projects, management, and leadership; having capacity for entrepreneurial leadership	EU, Danish, UK
Analyze and evaluate relationships between research-based knowledge and possible business models; understand the opportunities for using knowledge gained in higher education in a new venture context	EU, Danish, UK
Knowledge of methods to develop personal and professional academic resources; build know-how	EU, Danish, UK
Selling (knowing that income comes from selling)	EU, UK, USA
Owning development	EU, UK, USA
Can see product/service as a set of benefits to the customer	EU, UK, USA
Can apply entrepreneurial competencies to the stages of business growth	EU, UK, USA
Can relate entrepreneurial competencies to the design of entrepreneurial organizations of different scales and contexts (public and private)	EU, UK, USA
Can develop a product/service concept	EU, UK, USA
Can find, approach, and sustain good customers	EU, UK, USA
Can appraise and learn from competition	EU, UK, USA
Can cost and apply price	EU, UK, USA
Can anticipate major business development and survival problems	EU, UK, USA
Can deal with all of the statutory and regulatory aspects of self-employment	EU, UK, USA
Can effectively use IT and the Internet in general in pursuit of building a business; having strong international web-based management capacity	EU, UK, USA

TABLE 5: Continued.

Competencies	Models
Can describe and compare cultures	Nordic, USA
Translate needs, wants, and interests into goals, and help others to reflect on theirs (following aspirations)	EU, UK
Protecting ideas, including intellectual property rights, describe strategies for how to do it	EU, USA
Ability to use proper strategies to keep up individual and team's motivation	EU, USA
Assessing impact (choose right indicators, monitor, analyze, and reiterate)	EU, USA

Note. Competence models in brackets (e.g., "(USA)") indicate that the competency was described either vaguely or indirectly in the model. Source. UK model [39], USA model [34], Danish model [40], Nordic model [41], and EU model [37].

supports grasping what may be more important and efficient in various contexts, but more information about the application of competence models is needed.

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding the publication of this paper.

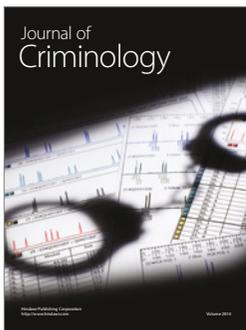
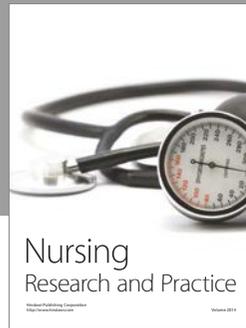
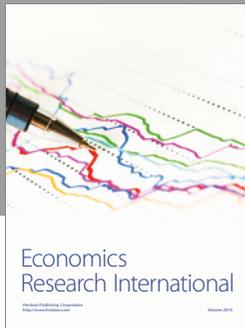
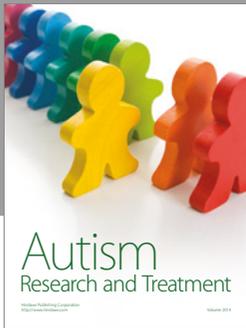
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