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*Uneven Development of Entrepreneurial Competencies:
Evidence from Albanian Higher Education Using the
EntreComp Framework*

ABSTRACT: This study argues that entrepreneurial competencies, while conceptually defined as distinct within the EntreComp framework, are empirically structured as interconnected dimensions within the context of the higher education. Using a quantitative research design, data were collected through a structured questionnaire administered to students at the University of Elbasan “Aleksander Xhuvani”. The instrument focused on competencies within the “Resources” and “Into Action” domains at an intermediate level of progression. Data were analysed using descriptive statistics, exploratory factor analysis, and analysis of variance.

The findings indicate that entrepreneurial competencies are unevenly developed and are organised into six empirically derived competency

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dimensions. Competencies related to taking initiative, planning, and learning through experience appear relatively well developed, while those associated with resource mobilisation and financial knowledge are comparatively weaker. The results also suggest that certain competencies, particularly those related to coping with uncertainty and working with others, are experienced in an integrated manner rather than as distinct elements.

This work further shows that the EntreComp framework provides a useful reference for assessing entrepreneurial competencies; however, its components are not reproduced in a one-to-one manner, as competencies tend to cluster into broader, context-dependent dimensions. Significant differences in competency levels are observed across gender and programme of study.

The study contributes to the literature by providing empirical evidence on the application of the EntreComp framework within a transitional economy and by offering insights into how entrepreneurial competencies are structured in practice. The findings have implications for higher education institutions, highlighting the need for greater emphasis on financial and resource-related competencies and for the integration of experiential and collaborative learning approaches.

KEYWORDS: Entrepreneurship education; EntreComp framework; Entrepreneurial competencies; Higher education; Albania; Factor analysis.

SUMMARY: 1. Introduction. – 2. Literature Review. – 3. Methodology. – 4. Results. – 5. Discussion. – 6. Conclusions and Recommendations.

1. Introduction

Entrepreneurship has become an increasingly prominent component of economic development strategies, innovation systems, and higher education agendas. In contemporary knowledge-based economies, entrepreneurial activity is widely associated with value creation, job generation, and the capacity to respond to dynamic and uncertain environments. As a result, the focus of research and policy has progressively shifted from viewing entrepreneurship solely as the creation of new ventures towards understanding it as a set of competencies that can be developed across different contexts, including education (López-Núñez et al., 2022; Rațiu et al., 2023).

Within this perspective, higher education institutions have assumed a central role in fostering entrepreneurial competencies among students. Universities are increasingly expected not only to transmit disciplinary knowledge but also to equip graduates with the skills, attitudes, and capabilities necessary to navigate complex labour markets and engage in entrepreneurial activity (Ferrerías-García et al., 2021). This shift has been accompanied by the growing integration of entrepreneurship education into curricula and by the adoption of competence-based approaches aimed at supporting students' personal and professional development.

However, existing research indicates that the development of entrepreneurial competencies is neither uniform nor guaranteed. Empirical studies indicate that students tend to demonstrate higher levels of certain competencies, such as creativity and opportunity recognition, while showing weaker development in others, particularly those related to financial and resource management (Baylina et al., 2023; Chudy-Laskowska et al., 2021). In addition, differences in competency levels have been observed across individual and contextual factors, including gender,

educational background, and career orientation (Ratković et al., 2022). Previous research also highlights a gap between the acquisition of entrepreneurial competencies in higher education and their application in real-world contexts, suggesting limitations in the practical enactment of these capabilities (Sánchez-Hernández & Maldonado-Briegas, 2023).

In response to the need for a more structured understanding of entrepreneurship as a competence, the European Commission introduced the EntreComp framework (Bacigalupo et al., 2016). This framework conceptualises entrepreneurship as the ability to act upon opportunities and ideas to create value and organises this competence into three areas: “Ideas and Opportunities”, “Resources”, and “Into Action”, comprising fifteen competencies. Since its introduction, EntreComp has been widely used in research, policy, and practice as a reference model for competence-based approaches to entrepreneurship education (Rațiu et al., 2023). In addition, the increasing complexity and uncertainty of contemporary environments further emphasise the importance of competencies that enable individuals to act under conditions of ambiguity and change, particularly as entrepreneurial competence involves interpretative and reflective processes in practice (Penaluna & Ranson, 2024).

Despite its widespread adoption, empirical evidence indicates that the application of the EntreComp framework varies across contexts, with challenges in translating its conceptual structure into measurable and contextually relevant outcomes (Seikkula-Leino et al., 2021; Joensuu-Salo et al., 2022). There is limited evidence regarding how competencies defined within the framework are reflected in students’ perceived capabilities and whether they emerge as distinct elements or as more integrated patterns in practice. This raises questions regarding the extent

to which the framework captures the way entrepreneurial competencies are developed within higher education environments.

In this context, Albania provides a relevant setting for examining the development of entrepreneurial competencies. As a transitional economy undergoing structural and institutional transformation, the country has increasingly emphasised entrepreneurship as a driver of economic growth and employment (European Bank for Reconstruction and Development [EBRD], 2024). At the same time, higher education institutions are facing growing expectations to support innovation, enhance employability, and promote competence-based learning. Despite these developments, empirical evidence on entrepreneurial competencies among students in Albania remains limited, particularly when examined through structured frameworks such as EntreComp. This study addresses this gap by providing empirical evidence on how entrepreneurial competencies are structured in practice within a transitional higher education context.

Against this background, this study focuses on competencies within the “Resources” and “Into Action” domains of the EntreComp framework, which capture the more applied and action-oriented aspects of entrepreneurial competence. The study aims to examine how these competencies are reflected in students’ self-assessments and to explore their underlying structure using empirical analysis.

The aim of this study is therefore to examine entrepreneurial competencies among university students within the EntreComp framework and to assess its applicability in the context of Albanian higher education. More specifically, the study seeks to analyse the extent to which the competencies defined within the selected EntreComp domains are reflected in students’ perceived capabilities and to explore how these competencies are structured empirically. The study adopts a quantitative

research design based on survey data and statistical analysis. The study is limited to a single institutional context and relies on self-reported data, which may affect the generalisability of the findings.

To address this aim, the study is guided by the following research questions:

RQ1: What is the level and distribution of entrepreneurial competencies among students in Albanian higher education?

RQ2: To what extent does the EntreComp framework provide a meaningful structure for assessing these competencies in this context?

RQ3: How are entrepreneurial competencies structured empirically, and how do they vary across student characteristics?

By addressing these questions, this study contributes to the literature in two main ways. First, it provides empirical evidence on the application of the EntreComp framework within a transitional economy, thereby contributing to discussions on its contextual validity. Second, it offers insights into how entrepreneurial competencies are organised in practice, highlighting the extent to which they may emerge as interconnected dimensions rather than as discrete elements.

The remainder of the paper is structured as follows. Section 2 reviews the relevant literature, section 3 outlines the research methodology, section 4 presents the empirical results, and section 5 discusses the findings, followed by conclusions and recommendations.

2. Literature Review

Entrepreneurship as a competence

Entrepreneurship has increasingly been conceptualised as a competence that extends beyond the creation of new ventures. Within this perspective, entrepreneurial competence is commonly understood as a combination of knowledge, skills and attitudes that enable individuals to recognise opportunities, mobilise resources and create value (López-Núñez et al., 2022). From a competency-based perspective, entrepreneurship is not limited to venture creation but involves a set of developable capabilities that support opportunity recognition, value creation, and action-oriented behaviour (Morris et al., 2013).

Early work in this area identifies a range of competencies associated with entrepreneurial behaviour, including initiative, persistence, problem-solving and planning abilities (Vijay & Ajay, 2011). These competencies are linked to the different roles performed by entrepreneurs, such as managerial, functional and entrepreneurial roles, suggesting that entrepreneurship involves a combination of interrelated capabilities rather than a single skill set. Subsequent studies have examined the relationship between entrepreneurial competencies and organisational outcomes, indicating that competencies, together with skills and networking, are associated with enterprise performance (Soomro et al., 2025).

Empirical research further indicates that the manifestation of entrepreneurial competencies differs across individuals. Variations in competency levels have been observed in relation to factors such as field of study, gender and professional experience (Chudy-Laskowska et al., 2021; Ratković et al., 2022). These findings suggest that entrepreneurial competence is shaped by both individual characteristics and educational environments.

Overall, entrepreneurship can be understood as a multidimensional competence that integrates cognitive, behavioural, and contextual

elements. This perspective provides a foundation for examining how such competencies can be developed within higher education and assessed through structured approaches.

This competence-based perspective provides a theoretical foundation for examining not only the level of entrepreneurial competencies but also their internal structure and interrelationships in educational contexts.

Entrepreneurship education and competence development

Within this competence-based perspective, higher education institutions have increasingly been positioned as key environments for the development of entrepreneurial competencies. In the European context, educational policies have progressively emphasised competence-based learning, encouraging universities to foster not only knowledge acquisition but also the development of skills and attitudes relevant to employability and entrepreneurship (Ferrerias-Garcia et al., 2021).

Empirical studies indicate that participation in entrepreneurship-related educational activities is associated with the development of specific entrepreneurial competencies. Research applying the EntreComp framework shows that students report relatively higher levels of competencies such as creativity, curiosity and opportunity recognition (Chudy-Laskowska et al., 2021). At the same time, differences across competency areas are evident, with comparatively lower levels observed in certain resource-related competencies (Baylina et al., 2023).

Further evidence indicates that competency development is influenced by individual and contextual factors. Differences have been identified in relation to gender, career intentions and educational background, indicating that outcomes are not uniform across student populations (Ratković et al., 2022). In addition, the role of experiential learning has

been emphasised, with studies highlighting the importance of practical activities and real-world engagement in supporting competence development (Pašić et al., 2023).

Despite these contributions, the effectiveness of entrepreneurship education remains uneven. Previous research highlights a persistent gap between the acquisition of entrepreneurial competencies and their practical application, indicating that students often face challenges in transferring knowledge and skills into real-world contexts (Pašić et al., 2023; Sánchez-Hernández & Maldonado-Briegas, 2023).

From a broader perspective, the impact of entrepreneurship education has been widely examined, with findings suggesting that its outcomes are often inconsistent and context-dependent (Nabi et al., 2017). In this regard, competency-based approaches are increasingly recognised as more appropriate for capturing educational outcomes, as they focus on the development of practical capabilities rather than solely on knowledge acquisition (Hammoda, 2024).

Moreover, empirical studies demonstrate that entrepreneurial competencies are not uniformly developed among students, with variations observed across disciplines, institutional settings, and learning environments (Dehtjare et al., 2025; Martínez-Martínez & Ventura, 2020). These findings reinforce the need for structured frameworks, such as EntreComp, to support both the development and assessment of entrepreneurial competencies.

However, existing studies often focus on the level of competencies rather than their empirical structure, leaving limited understanding of how these competencies are organised in practice.

The EntreComp framework

One of the most widely adopted frameworks addressing the development and assessment of entrepreneurial competencies is the EntreComp, introduced by the European Commission (Bacigalupo et al., 2016). The framework conceptualises entrepreneurship as the ability to act upon opportunities and ideas to create value for others and organises this competence into three areas: “Ideas and Opportunities”, “Resources” and “Into Action”, comprising a total of fifteen competencies.

The EntreComp framework has been applied across a range of domains, including curriculum development, competence assessment and policy initiatives, reflecting its adaptability across different contexts (Rațiu et al., 2023). Its structure allows for the definition of learning outcomes and progression levels, making it suitable for use in both formal and informal educational settings.

In addition to its conceptual contribution, the framework has supported the development of measurement tools for assessing entrepreneurial competencies. For example, validated questionnaires based on the framework have been developed and tested using statistical techniques such as confirmatory factor analysis, demonstrating satisfactory reliability and validity (López-Núñez et al., 2022). Empirical applications have used these tools to assess competency levels among students and graduates, providing insights into strengths in areas such as creativity and opportunity recognition.

At the same time, bibliometric analyses show that research on EntreComp framework has expanded since its introduction, with increasing attention to its application across different contexts and disciplines (Rațiu et al., 2023). However, differences in how the framework is implemented across studies indicate the need for further empirical examination, particularly within specific national and institutional settings.

While the EntreComp framework conceptualises entrepreneurial competence as a set of distinct elements organised across three domains, empirical studies suggest that its structure may vary across contexts and applications. Competencies do not always emerge as clearly separable constructs when measured empirically, and alternative factor structures have been identified in different studies (Joensuu-Salo et al., 2022; López-Núñez et al., 2022; Rațiu et al., 2023). These findings indicate that the organisation of entrepreneurial competencies may be context-dependent and influenced by the way in which they are operationalised and experienced, particularly within higher education environments. This raises important questions regarding the extent to which the conceptual structure of EntreComp is reflected in empirical data, particularly in specific institutional and national contexts.

Empirical evidence and research gaps

A growing body of empirical research has applied the EntreComp framework to examine entrepreneurial competencies among students and other populations (Joensuu-Salo et al., 2022; Rațiu et al., 2023). These studies provide evidence of both the usefulness of the framework and the diversity of competency outcomes.

Findings indicate that competencies related to creativity and idea generation tend to be more developed, while those associated with financial and economic knowledge are often less developed (Baylina et al., 2023; Chudy-Laskowska et al., 2021). In addition, differences in competency levels have been identified across demographic and educational variables, including gender, field of study, and career orientation (Ratković et al., 2022).

Further research has explored the relationship between entrepreneurial competencies and behavioural outcomes. Evidence from multiple European contexts indicates that competencies measured through EntreComp are associated with entrepreneurial intentions and start-up behaviour, although the strength of this relationship varies across contexts (Joensuu-Salo et al., 2022). In addition, studies indicate that individuals may recognise the importance of certain competencies while simultaneously assessing their own level of competence as relatively low (Wolgast et al., 2025).

Despite these contributions, important gaps remain. There is limited empirical evidence regarding the application of the EntreComp framework in transitional and developing economies, as well as limited understanding of how competencies developed within higher education align with those required in practice (Sánchez-Hernández & Maldonado-Briegas, 2023). Existing research has primarily focused on measuring competency levels, with less attention given to their empirical configuration and interrelationships. In this context, the present study contributes by examining not only the level but also the underlying structure of entrepreneurial competencies within Albanian higher education, thereby providing further empirical insight into the contextual validity of the EntreComp framework.

3. Methodology

This study adopts a quantitative research design to examine entrepreneurial competencies among university students and to assess the

applicability of the EntreComp framework within the context of Albanian higher education.

Data were collected through a structured questionnaire administered to students enrolled at the University of Elbasan “Aleksandër Xhuvani”. The questionnaire was distributed online via Google Forms over the period from January to April 2023. In total, 124 valid questionnaires were collected and used for both descriptive and inferential analyses.

The research instrument was developed based on the EntreComp framework (Bacigalupo et al., 2016), focusing on competencies within the “Resources” and “Into Action” domains. These domains were selected as they capture the application-oriented dimensions of entrepreneurial competence, particularly those related to resource mobilisation and the implementation of ideas. Given the focus of this study on the practical development and enactment of competencies among students, these domains were considered the most relevant for empirical investigation. The questionnaire included demographic questions and a set of statements measuring entrepreneurial competencies using a Likert scale, allowing for the assessment of students’ self-perceived capabilities.

The selection of competencies included in this study is guided by the intermediate level of the EntreComp framework progression model, which is considered an appropriate level for students in higher education (Bacigalupo et al., 2016). This reflects the expectation that students should be able to apply entrepreneurial knowledge and skills with a certain degree of autonomy, while still developing more advanced capabilities. This approach is supported by previous research suggesting that university students are expected to demonstrate at least an intermediate level of entrepreneurial competence (Strauti et al., 2018).

The use of structured instruments to measure entrepreneurial competencies is consistent with prior research emphasising the importance of reliable and theoretically grounded measurement tools in entrepreneurship studies (Liñán & Chen, 2009).

Data analysis was conducted using SPSS statistical software. Descriptive statistics were first employed to examine the distribution and characteristics of the sample, addressing the first research question.

Given the exploratory nature of this study and the aim to examine the empirical structure of competencies within a specific context, exploratory factor analysis was considered appropriate. Subsequently, exploratory factor analysis (EFA) was conducted using the full dataset ($N = 124$), with variables grouped according to the selected EntreComp framework domains. Separate analyses were performed for each domain to examine the structure of competencies within each area. The suitability of the data for factor analysis was evaluated using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s Test of Sphericity, while factors were extracted using principal component analysis (Hair et al., 2019). The internal consistency of the identified factors was assessed using Cronbach’s alpha (Cronbach, 1951).

Following the extraction of competency dimensions through exploratory factor analysis, composite scores were calculated for each identified factor and used as dependent variables in subsequent analyses.

Finally, analysis of variance (ANOVA) was conducted to examine differences in entrepreneurial competencies across student characteristics, addressing the third research question.

Participation in the study was voluntary and anonymous, and all data were used exclusively for research purposes in accordance with standard ethical principles.

4. Results

Sample Characteristics

The sample consists of 124 students enrolled at the University of Elbasan “Aleksandër Xhuvani”. The main characteristics of the respondents are presented in Table 1. The sample is predominantly female, with most students aged between 18 and 22 years. Participants are mainly enrolled in Bachelor programmes and are primarily drawn from Economics and Foreign Languages.

Table 1. Sample Characteristics (N = 124)

Variable	Category	%
Age	18–20	42.2%
	20–22	50.0%
	23–25	3.1%
	>25	4.7%
Gender	Female	87.5%
	Male	9.4%
	Not specified	3.1%
Field	Economics	43.8%
	Foreign Languages	43.7%
	Medicine	6.3%
	Humanities	3.1%
	Engineering	3.1%
Study programme	Bachelor	84.4%

	Master	15.6%
Study year	First	18.8%
	Second	37.5%
	Third	25.0%
	Not specified	18.7%
Work experience	No prior work experience	53.1%
	1-3 years	34.4%
	>3	12.5%
Family entrepreneurial background	Yes	31.3%
	No	68.7%

Source: *own compilation*

Factor Structure of Entrepreneurial Competency Dimensions

Exploratory factor analysis (EFA) was conducted using the full sample ($N = 124$), with variables grouped according to the selected EntreComp domains (“Resources” and “Into Action”). Separate analyses were performed for each domain to examine the internal structure of entrepreneurial competencies within each area.

The suitability of the data for factor analysis was confirmed, with KMO values ranging between 0.623 and 0.823 and Bartlett’s tests of sphericity being statistically significant ($p < 0.001$), indicating adequate to good sampling adequacy.

Based on eigenvalues greater than one and the interpretability of the factor solution, six competency dimensions were identified across the two domains. The structure of these dimensions is illustrated in Figure 1, which provides an overview of how the extracted factors are distributed across the “Resources” and “Into Action” domains. Detailed factor

loadings and the corresponding measurement items for each dimension are reported in Appendix A, allowing for a more precise interpretation of the empirical structure.

All retained items demonstrated factor loadings above 0.60, supporting their inclusion within the respective dimensions. Internal consistency was high to very high, with Cronbach's alpha values ranging from 0.764 to 0.934.

The extracted dimensions represent empirically derived groupings. As such, they do not correspond in a one-to-one manner to individual EntreComp competencies but instead reflect clusters of related capabilities as perceived and reported by students.

Competency Dimensions within the “Resources” Domain

Within the “Resources” domain, three competency dimensions were identified.

The first dimension, self-awareness, self-efficacy, motivation and persistence ($\alpha = 0.934$), captures students' perceptions of their internal capabilities and their ability to mobilise personal resources. As shown in Appendix A, the items loading on this dimension reflect confidence in one's abilities, willingness to exert effort, and the capacity to evaluate opportunities and personal strengths. These elements appear to form a coherent and integrated psychological dimension rather than separate competencies.

The second dimension, resource mobilisation and financial/economic knowledge ($\alpha = 0.886$), encompasses competencies related to the effective management and allocation of resources. The associated items, presented in Appendix A, indicate a strong emphasis on financial literacy, time management, and the identification of funding sources and support

mechanisms. This dimension reflects the more technical and operational aspects of entrepreneurial competence and aligns closely with resource-oriented components of the EntreComp framework.

The third dimension, team mobilisation ($\alpha = 0.764$), reflects interpersonal competencies associated with engaging and coordinating others. The items loading on this factor, as detailed in Appendix A, relate to communication, the ability to convey ideas effectively, and acting as a role model within a group. Although based on a smaller number of items, this dimension captures a distinct aspect of entrepreneurial competence linked to collaboration and leadership in a social context.



Figure 1: *Structure of entrepreneurial competencies identified through factor analyses*

Source: *Own elaboration based on empirical data*

Competency Dimensions within the “Into Action” Domain

Within the “Into Action” domain, three additional competency dimensions were identified.

The dimension taking initiative and planning ($\alpha = 0.879$) reflects proactive behaviour and the capacity to translate ideas into action. The items associated with this dimension (Appendix A) indicate responsibility-taking, adaptability, and the ability to develop and adjust plans in response to changing circumstances. This indicates that initiative and planning are closely interconnected and are experienced as a combined action-oriented capability.

The dimension coping with uncertainty, ambiguity, risk, and working with others ($\alpha = 0.903$) represents a composite competency that integrates decision-making under uncertain conditions with interpersonal interaction. As detailed in Appendix A, this dimension combines items related to risk assessment and informed decision-making with items reflecting teamwork, active listening, and relationship-building.

Although these elements are conceptualised as distinct competencies within the EntreComp framework (Bacigalupo et al., 2016), their convergence within a single factor indicates that students tend to perceive and develop these capabilities in an interconnected manner. In practice, managing uncertainty appears to be closely linked to engaging with others, particularly in contexts where decision-making involves collaboration, information sharing, and collective judgement.

The final dimension, learning through experience ($\alpha = 0.930$), captures students' ability to reflect on their actions, incorporate feedback, and improve performance over time. The items reported in Appendix A consistently reflect reflective learning and feedback utilisation, indicating that this dimension represents a coherent and well-developed component of entrepreneurial competence among students.

Group Differences in Competency Dimensions

Differences across student characteristics were examined using the composite scores of the identified competency dimensions. Analysis of variance (ANOVA) revealed statistically significant differences across several competency dimensions in relation to student characteristics.

Gender differences were observed in dimensions related to team mobilisation, taking initiative and planning, and coping with uncertainty

and risk ($p < 0.001$; $p = 0.031$; $p = 0.004$, respectively), indicating variation in interpersonal, proactive, and decision-making capabilities.

Similarly, programme of study had a significant effect on competency dimensions associated with team mobilisation, planning and action, coping with uncertainty, and resource mobilisation and financial knowledge ($p = 0.006$; $p = 0.044$; $p = 0.036$; $p = 0.031$, respectively). These findings suggest that both interpersonal and resource-related competencies are influenced by educational background.

Overall, the results indicate that entrepreneurial competencies are not uniformly distributed across student groups but vary according to individual and contextual factors.

5. Discussion

This study demonstrates that entrepreneurial competencies, while conceptually defined as distinct within the EntreComp framework, are empirically structured as interconnected and context-dependent dimensions in higher education. These findings provide new empirical insight into the way entrepreneurial competencies are organised in practice and contribute to ongoing discussions on competence-based approaches to entrepreneurship education.

Regarding the first research question, the results indicate that entrepreneurial competencies are not uniformly developed across the identified competency dimensions. The analysis reveals a differentiated structure in which certain dimensions, particularly taking initiative and planning and learning through experience, appear more strongly developed. These dimensions reflect students' capacity for proactive

behaviour, adaptability, and reflective learning, suggesting that higher education may be relatively effective in supporting action-oriented and experiential aspects of entrepreneurial competence.

In contrast, comparatively weaker development is observed in the dimension resource mobilisation and financial/economic knowledge, which includes financial literacy, resource allocation, and the identification of funding sources. This imbalance indicates that while students may feel capable of acting on ideas, they are less confident in managing the practical and financial aspects required to sustain entrepreneurial activity. A similar pattern has been reported in previous empirical studies, which identify stronger development in behavioural or opportunity-related competencies alongside weaker performance in resource-related areas (Baylina et al., 2023; Chudy-Laskowska et al., 2021).

At the same time, the findings highlight the role of internal and interpersonal dimensions of competence. The dimension self-awareness, self-efficacy, motivation and persistence reflects a strong internal capability base, indicating that students perceive themselves as motivated and capable of engaging in value-creating activities. In addition, team mobilisation and the dimension combining coping with uncertainty, ambiguity, risk, and working with others point to the importance of social interaction and collaboration within students' competence profiles.

Notably, the latter dimension indicates that competencies related to uncertainty management and interpersonal interaction are not experienced as separate constructs. Instead, they appear to develop in an interconnected manner, indicating that decision-making under uncertain conditions is closely linked to collaboration, information exchange, and collective problem-solving. This interpretation is consistent with research showing that entrepreneurial competencies are often enacted through

behaviour and action (Joensuu-Salo et al., 2022) and that their development is closely associated with experiential and group-based learning processes (Pašić et al., 2023).

Overall, these findings reinforce the view that entrepreneurial competencies are unevenly developed among students, while also suggesting that they may cluster into broader, multidimensional capability sets. In this respect, the results extend previous research by demonstrating that competencies are not only uneven but also structurally interconnected in practice.

In relation to the second research question, the findings indicate that the EntreComp framework is only partially reflected in the empirical structure identified in this study. While the extracted competency dimensions broadly correspond to the “Resources” and “Into Action” domains, they do not replicate the individual competencies of the framework in a one-to-one manner. Instead, several dimensions combine elements that are conceptually distinct within EntreComp, as illustrated by the integration of uncertainty management and collaboration within a single factor.

This outcome does not necessarily suggest a limitation of the framework itself but rather highlights the context-dependent nature of its empirical application. The findings indicate that students tend to perceive and develop competencies in a more integrated way than the conceptual structure of the framework might imply. This interpretation aligns with previous research showing variation in how the EntreComp framework is operationalised and applied across different empirical contexts (Joensuu-Salo et al., 2022; Rațiu et al., 2023).

Furthermore, the focus on competencies aligned with the intermediate progression level provides additional insight into students’ developmental stage. The results suggest that students demonstrate relatively strong

capabilities in areas associated with initiative, motivation, and learning, while competencies requiring more specialised knowledge, such as financial and resource management, remain less developed. This is consistent with the expectation that university students operate at an intermediate level of entrepreneurial competence, with further development required to achieve more advanced proficiency (Strauti et al., 2018).

With respect to the third research question, the findings reveal significant differences across competency dimensions in relation to gender and programme of study. These differences are particularly evident in dimensions related to interpersonal interaction, action orientation, and resource management. Such variation supports empirical evidence indicating that entrepreneurial competencies differ across individual and educational characteristics (Ratković et al., 2022).

The presence of these differences indicates that a uniform approach to entrepreneurship education may not be sufficient. Instead, more tailored and context-sensitive approaches may be required to address the diverse needs and profiles of students.

From a broader perspective, the findings reinforce the view that the development of entrepreneurial competencies in higher education is uneven and context dependent. This is consistent with broader reviews of entrepreneurship education, which highlight variability in outcomes across programmes and contexts (Nabi et al., 2017), as well as with more recent empirical studies conducted in different educational settings (Dehtjare et al., 2025). In particular, the variation observed across competency dimensions indicates that different pedagogical approaches and learning environments contribute differently to competence development (Hammoda, 2024).

At the same time, the results confirm the relevance of the EntreComp framework as a useful reference for structuring and assessing entrepreneurial competencies. However, they also indicate that its empirical manifestation may differ from its conceptual design, suggesting that the framework should be applied as a flexible reference that allows for contextual adaptation in practice (Seikkula-Leino et al., 2021).

From a theoretical perspective, this study makes three main contributions. First, it provides empirical evidence supporting the application of the EntreComp framework within a transitional higher education context, thereby extending its contextual relevance. Second, it demonstrates that entrepreneurial competencies tend to emerge as integrated and multidimensional constructs rather than as discrete elements. Third, it highlights the importance of contextual factors in shaping the empirical structure of competencies, contributing to discussions on the validity and adaptability of competence-based frameworks.

From a practical perspective, the findings suggest that higher education institutions should place greater emphasis on competencies related to resource mobilisation and financial literacy, which appear comparatively less developed. In addition, the importance of experiential and collaborative learning is reinforced, given the strong presence of dimensions related to initiative, learning through experience, and socially embedded decision-making. Integrating more practice-oriented activities, such as project-based learning and engagement with real-world contexts, may therefore support a more balanced development of entrepreneurial competencies.

Finally, it should be noted that the focus on the “Resources” and “Into Action” domains allows for a detailed examination of action-oriented and operational competencies but does not capture the full range of

entrepreneurial capabilities included in the EntreComp framework. Competencies related to opportunity recognition and creativity are not addressed in this study. Future research could extend this analysis by incorporating all EntreComp domains and by examining multiple institutional contexts, thereby providing a more comprehensive and comparative understanding of entrepreneurial competence development in higher education.

6. Conclusions and Recommendations

This study demonstrates that entrepreneurial competencies among university students, as conceptualised within the EntreComp framework, are not uniformly developed and tend to emerge as integrated, context-dependent dimensions. The findings provide empirical evidence that, within higher education, competencies are experienced as interconnected capability sets rather than as discrete elements.

Six competency dimensions were identified across the “Resources” and “Into Action” domains, reflecting empirically derived clusters of related capabilities. Among these, competencies related to taking initiative, planning, and learning through experience appear more developed, whereas those associated with resource mobilisation and financial and economic knowledge remain comparatively weaker. This suggests that students may feel more confident in acting on ideas than in managing the practical and financial aspects required to sustain entrepreneurial activity. The results also highlight the importance of internal and interpersonal dimensions. In particular, the integration of coping with uncertainty and working with others indicates that decision-making under uncertain

conditions is closely linked to collaboration and collective problem-solving in practice.

Overall, the findings confirm the relevance of the EntreComp framework as a useful reference for assessing entrepreneurial competencies, while also indicating that its conceptual structure is not reproduced in a one-to-one manner. Instead, competencies tend to cluster into broader, context-dependent dimensions, highlighting the need for flexible and context-sensitive applications of the framework.

From a practical perspective, the findings suggest that higher education institutions should place greater emphasis on developing financial literacy and resource management skills, alongside strengthening experiential and collaborative learning approaches. This may be achieved through the integration of practice-oriented activities, such as project-based learning and engagement with real-world entrepreneurial contexts.

This study is subject to certain limitations, including its focus on selected EntreComp domains and the use of self-reported data from a single institutional context.

Future research could extend this analysis by incorporating all EntreComp domains and by examining multiple institutional contexts, thereby providing a more comprehensive understanding of entrepreneurial competence development.

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Disclaimer

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Appendix

A1. Resources Domain

Factor 1: Self-awareness, Self-efficacy, Motivation and Persistence

(Cronbach's $\alpha = 0.934$; KMO = 0.794; Bartlett's Test $p < 0.001$)

Item	Description	Loading
V1	I aim to create consumer value by leveraging my assets and abilities	0.897
V2	I feel I have the ability to influence people and situations for the better	0.872
V3	I can use my talents to advance my career	0.847
V4	I am willing to put in the effort necessary to achieve my objectives	0.894
V5	I distinguish between internal and external motivation	0.898
V6	I can determine whether a concept is worth pursuing further	0.801

Factor 2: Resource Mobilisation and Financial/Economic Knowledge

(Cronbach's $\alpha = 0.886$; KMO = 0.823; Bartlett's Test $p < 0.001$)

Item	Description	Loading
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V1	I am responsible and efficient with my resources	0.895
V2	I manage my time effectively to achieve objectives	0.842
V3	I can locate support services for business activities	0.640
V4	I understand financial statements (income/balance sheets)	0.787
V5	I can calculate financial needs for value-creating activities	0.883
V6	I identify funding sources for my activities	0.771

Factor 3: Team Mobilisation

(Cronbach's $\alpha = 0.764$; KMO = 0.623; Bartlett's Test $p < 0.001$)

Item	Description	Loading
V1	I set a good example	0.821
V2	I can communicate ideas effectively to others	0.903
V3	I choose communication channels appropriately	0.765

A2. Into Action Domain

Factor 4: Taking Initiative and Planning

(Cronbach's $\alpha = 0.879$; KMO = 0.748; Bartlett's Test $p < 0.001$)

Item	Description	Loading
V1	I take responsibility for actions individually or in groups	0.854

V2	I can build independent business activities	0.736
V3	I create value by solving problems and seizing opportunities	0.875
V4	I adapt plans based on new opportunities	0.629
V5	I focus on business models that create value	0.852
V6	I adjust plans based on external changes	0.813

Factor 5: Coping with Uncertainty, Risk and Working with Others

(Cronbach's $\alpha = 0.903$; KMO = 0.792; Bartlett's Test $p < 0.001$)

Item	Description	Loading
V1	I gather information to reduce uncertainty and risk	0.696
V2	I explore options and make informed decisions	0.859
V3	I recognise the importance of risk assessment	0.867
V4	I actively listen to others (e.g. clients)	0.823
V5	I build teams for collaborative work	0.884
V6	I develop relationships for emotional and professional support	0.836

Factor 6: Learning through Experience

(Cronbach's $\alpha = 0.930$; KMO = 0.742; Bartlett's Test $p < 0.001$)

Item	Description	Loading
V1	I evaluate my achievements and learn from them	0.958

V2	I work on improving strengths and reducing weaknesses	0.931
V3	I use feedback from others to improve performance	0.924