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FACTOR ANALYSIS OF ENTREPRENEURSHIP ECOSYSTEM TO DEVELOP COMPREHENSHIP ENTREPRENEURSHIP SKILLS

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ABSTRACT

Purpose: To comprehensively develop entrepreneurship skills in students and ultimately cultivate young entrepreneurs with strong capabilities, a holistic approach requires the integration of an entrepreneurial learning model supported by a campus entrepreneurship ecosystem and business incubators. This synergy aims to drive downstream activities and commercialization. This research aims to design an entrepreneurship learning model backed by a campus entrepreneurship ecosystem and business incubators to stimulate downstream activities and commercialization of products and services developed by students.

Design/Methodology/Approach: The study employs a mixed-methods approach, combining quantitative and qualitative methods. Data collection involves surveys, interviews, and focus group discussions. Respondents include 9 students, 5 MSME practitioners, 5 university incubator representatives, and 5 entrepreneurship lecturers. Data analysis techniques encompass factor analysis and content analysis, with a sample size of 200 students.

Research, Practical & Social implications: The outcome will be a designed entrepreneurship learning model supported by a campus entrepreneurship ecosystem and business incubators to facilitate downstream activities and commercialization of students' products and services.

Originality/Value: The proposed entrepreneurship learning model supported by a campus entrepreneurship ecosystem and business incubators, aimed at fostering downstream activities and commercialization of students' products and services, encompasses the following aspects: Enhanced Entrepreneurial Competence Learning Process, Entrepreneurship Internship Program, Bootcamp for Skill Enhancement, Prototyping and Validation, and Expo Engagement.

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ANÁLISE FATORIAL DO ECOSSISTEMA DE EMPREENDEDORISMO PARA DESENVOLVER HABILIDADES DE EMPREENDEDORISMO

RESUMO

Objectivo: Para desenvolver de forma abrangente competências de empreendedorismo nos estudantes e, em última análise, cultivar jovens empreendedores com fortes capacidades, uma abordagem holística requer a integração de um modelo de aprendizagem empreendedora apoiado por um ecossistema de empreendedorismo no

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campus e incubadoras de empresas. Esta sinergia visa impulsionar as atividades downstream e a comercialização. Esta pesquisa tem como objetivo projetar um modelo de aprendizagem de empreendedorismo apoiado por um ecossistema de empreendedorismo no campus e incubadoras de empresas para estimular atividades downstream e comercialização de produtos e serviços desenvolvidos pelos estudantes.
Desenho/Metodologia/Abordagem: O estudo emprega uma abordagem de métodos mistos, combinando métodos quantitativos e qualitativos. A coleta de dados envolve pesquisas, entrevistas e discussões em grupos focais. Os entrevistados incluem 9 estudantes, 5 profissionais de MPME, 5 representantes de incubadoras universitárias e 5 professores de empreendedorismo. As técnicas de análise de dados abrangem análise fatorial e análise de conteúdo, com amostra de 200 alunos.
Implicações de pesquisa, Práticas e Sociais: O resultado será um modelo de aprendizagem de empreendedorismo projetado, apoiado por um ecossistema de empreendedorismo no campus e incubadoras de empresas para facilitar atividades posteriores e a comercialização de produtos e serviços dos alunos.
Originalidade/Valor: O modelo de aprendizagem de empreendedorismo proposto, apoiado por um ecossistema de empreendedorismo universitário e incubadoras de empresas, destinado a promover atividades a jusante e a comercialização de produtos e serviços dos alunos, abrange os seguintes aspectos: Processo de aprendizagem de competências empreendedoras melhorado, Programa de Estágio de Empreendedorismo, Bootcamp para Aprimoramento de habilidades, prototipagem e validação e envolvimento em exposições.

Palavras-chave: Modelo de Aprendizagem, Ecossistema de Empreendedorismo, Incubadora de Empresas, Atividades Downstream, Comercialização.

ANÁLISIS FACTORIAL DEL ECOSISTEMA EMPRENDEDOR PARA DESARROLLAR HABILIDADES EMPRENDEDORAS

RESUMEN
Propósito: Para desarrollar integralmente habilidades empresariales en los estudiantes y, en última instancia, cultivar jóvenes emprendedores con capacidades sólidas, un enfoque holístico requiere la integración de un modelo de aprendizaje empresarial respaldado por un ecosistema empresarial universitario e incubadoras de empresas. Esta sinergia tiene como objetivo impulsar las actividades downstream y la comercialización. Esta investigación tiene como objetivo diseñar un modelo de aprendizaje empresarial respaldado por un ecosistema de emprendimiento en el campus e incubadoras de empresas para estimular las actividades posteriores y la comercialización de productos y servicios desarrollados por los estudiantes.
Diseño/Metodología/Enfoque: El estudio emplea un enfoque de métodos mixtos, combinando métodos cuantitativos y cualitativos. La recopilación de datos implica encuestas, entrevistas y discusiones de grupos focales. Los encuestados incluyeron 9 estudiantes, 5 profesionales de MIPYMES, 5 representantes de incubadoras universitarias y 5 profesores de emprendimiento. Las técnicas de análisis de datos abarcan el análisis factorial y el análisis de contenido, con un tamaño de muestra de 200 estudiantes.
Implicaciones de Investigación, Prácticas y Sociales: el resultado será un modelo de aprendizaje empresarial diseñado respaldado por un ecosistema empresarial del campus e incubadoras de empresas para facilitar las actividades posteriores y la comercialización de los productos y servicios de los estudiantes.
Originalidad/Valor: El modelo de aprendizaje empresarial propuesto, respaldado por un ecosistema de emprendimiento en el campus e incubadoras de empresas, destinado a fomentar actividades posteriores y la comercialización de productos y servicios de los estudiantes, abarca los siguientes aspectos: proceso de aprendizaje de competencia empresarial mejorado, programa de pasantías de emprendimiento, campamento de entrenamiento para Mejora de habilidades, creación de prototipos y validación, y participación en exposiciones.

Palabras clave: Modelo de Aprendizaje, Ecosistema de Emprendimiento, Incubadora de Empresas, Actividades Downstream, Comercialización.

INTRODUCTION

In the face of globalization and the rapid demands of economic change, entrepreneurial competence has become an increasingly crucial quality for individuals and communities. Entrepreneurial skills are not only essential within the business context alone but also across

various sectors of life. Entrepreneurship is considered a key solution to enhance a nation's economic competitiveness while facilitating innovation and novel creations (Shane & Venkataraman, 2000). However, the development of entrepreneurship necessitates a deep understanding and proficiency, particularly in a comprehensive context.

The comprehensive enhancement of entrepreneurial skills requires a holistic approach that encompasses diverse factors and elements within an entrepreneurial ecosystem. This ecosystem encompasses an environment that supports and facilitates the growth of new enterprises, encompassing educational aspects, funding, infrastructure, regulations, and business networks (Isenberg, 2010). Within this context, factor analysis assumes a pivotal role in unraveling the intricacies of the entrepreneurial ecosystem that influence the development of comprehensive entrepreneurial skills.

Factor analysis plays a central role in identifying interrelated variables within a complex dataset. In the context of this research, factor analysis is employed to unveil the key dimensions of the entrepreneurial ecosystem that influence the development of comprehensive entrepreneurial skills. By comprehending the core factors that shape the entrepreneurial ecosystem, effective strategies for the development of entrepreneurial skills can be designed and implemented.

Although previous research has explored various facets of the entrepreneurial ecosystem, there remains a gap in understanding how these factors interact and contribute to the development of holistic entrepreneurial skills. Consequently, this study aims to conduct factor analysis of the entrepreneurial ecosystem to foster the cultivation of comprehensive entrepreneurial skills.

The establishment and nurturing of entrepreneurship skills among individuals have become increasingly important in the contemporary business landscape. Entrepreneurship skills are not only critical for driving economic growth and innovation but also for fostering a culture of self-reliance and adaptability in an ever-evolving global market. Consequently, researchers and policymakers alike have recognized the need to investigate the factors that contribute to the development of comprehensive entrepreneurship skills within the context of a robust entrepreneurship ecosystem.

Entrepreneurship ecosystems encompass the various elements, interactions, and resources that influence the entrepreneurial activities within a specific region or community (Mason & Brown, 2014). These ecosystems play a pivotal role in shaping the entrepreneurial mindset, providing access to knowledge, capital, and networks, and enabling entrepreneurs to

navigate the challenges associated with venture creation and growth (Spigel, 2017). As such, understanding the components and dynamics of an entrepreneurship ecosystem becomes crucial in fostering the comprehensive development of entrepreneurship skills.

Factor analysis serves as a valuable quantitative method for discerning the underlying factors that contribute to the development of entrepreneurship skills within an ecosystem. By examining the interrelationships among a set of observed variables, factor analysis identifies latent constructs that represent broader dimensions of entrepreneurship skills. Previous studies have demonstrated the applicability of factor analysis in various domains, such as identifying factors influencing entrepreneurial intentions (Lumpkin et al., 2009) and entrepreneurial orientation (Rauch et al., 2009).

Considering the increasing emphasis on entrepreneurship education and the role of entrepreneurship ecosystems in shaping the development of entrepreneurial competencies, there exists a compelling rationale to investigate the underlying factors within an entrepreneurship ecosystem that contribute to the holistic enhancement of entrepreneurship skills. This study aims to leverage factor analysis to discern the key elements within an entrepreneurship ecosystem that collectively foster comprehensive entrepreneurship skills.

In conclusion, the contemporary business landscape demands a deep exploration of the factors within entrepreneurship ecosystems that contribute to the development of comprehensive entrepreneurship skills. The integration of factor analysis as a methodological approach holds promise in uncovering the latent dimensions that play a vital role in shaping these skills. The outcomes of this research will not only enrich the understanding of entrepreneurship ecosystems but also provide insights into effective strategies for nurturing entrepreneurship skills essential for economic growth and innovation.

THEORETICAL FRAMEWORK

Entrepreneurship Ecosystem

The concept of an "Entrepreneurship Ecosystem" represents a dynamic and interconnected framework that fosters entrepreneurial activity within a specific geographical region or industry (Mason & Brown, 2014). This theory acknowledges that successful entrepreneurship is not solely the result of individual effort but is influenced by a complex web of factors, both tangible and intangible, that collectively shape the entrepreneurial landscape. At its core, the entrepreneurship ecosystem theory emphasizes the importance of supportive institutions, such as universities, research centers, and government agencies, which play a

pivotal role in nurturing entrepreneurship (Spigel, 2017). These institutions provide resources, funding, and a conducive regulatory environment to facilitate entrepreneurial ventures.

Access to financial capital is a critical element within an entrepreneurship ecosystem, with various sources of funding available, including venture capital, angel investors, and government grants (Mason & Brown, 2014). Adequate financial resources enable entrepreneurs to start and scale their ventures, driving economic growth. In addition to financial capital, human capital is another key pillar of the ecosystem, as it encompasses the skills, knowledge, and expertise of individuals within the entrepreneurial community (Spigel, 2017). Universities and training programs contribute to the development of this human capital by providing education and training in entrepreneurship-related disciplines (Kapil, Y., Saxena, N., Mohan, P., 2023).

Networking and social capital are fundamental aspects of the entrepreneurship ecosystem, facilitating knowledge sharing and collaboration among entrepreneurs, mentors, and investors (Mason & Brown, 2014). Entrepreneurs benefit from a supportive network that offers guidance, mentorship, and opportunities for collaboration. A culture of entrepreneurship, characterized by a tolerance for risk, a celebration of innovation, and an acceptance of failure as a learning opportunity, is a crucial intangible element within the ecosystem (Spigel, 2017). Such a culture encourages individuals to pursue entrepreneurial endeavors and promotes a positive attitude towards innovation. Lastly, the physical infrastructure and access to technology, including co-working spaces, incubators, and digital connectivity, are essential components of the entrepreneurship ecosystem (Mason & Brown, 2014). These resources provide entrepreneurs with the physical and technological infrastructure needed to operate and grow their businesses.

Comprehensive Entrepreneurship Skills

Comprehensive Entrepreneurship Skills, as conceptualized in academic literature, encompass a multifaceted set of competencies essential for entrepreneurs to thrive in the dynamic landscape of business and innovation (Hisrich, Peters, & Shepherd, 2017). This theory posits that successful entrepreneurs must synthesize and apply a diverse array of skills, integrating various facets of leadership, creativity, management, communication, finance, marketing, strategic thinking, and risk management into their entrepreneurial endeavors (Kuratko & Hodgetts, 2017). The foundation of Comprehensive Entrepreneurship Skills lies in leadership capabilities, as effective leadership serves as the compass guiding entrepreneurial

ventures toward their strategic objectives (Shane & Venkataraman, 2000). Entrepreneurs are expected to demonstrate visionary leadership, effective decision-making, and the ability to inspire and motivate their teams (Mohamad, 2023).

Creativity and innovation, crucial elements of the theory, empower entrepreneurs to devise novel solutions to complex challenges and exploit opportunities (Shane & Venkataraman, 2000). These skills foster adaptability and an entrepreneurial mindset, enabling individuals to anticipate market trends and devise unique value propositions (DeTienne & Chandler, 2007). Effective management skills are imperative for entrepreneurs, encompassing the ability to plan, organize, control, and supervise daily business operations (Kuratko & Hodgetts, 2017). These skills ensure efficiency, resource optimization, and the sustained growth of enterprises. Communication skills, a cornerstone of Comprehensive Entrepreneurship Skills, facilitate the establishment of robust relationships with stakeholders such as customers, partners, and employees (Hisrich et al., 2017). Proficient communication is essential for conveying a compelling brand narrative and promoting products or services effectively. Financial acumen is a critical facet of the theory, demanding a strong grasp of business finance principles, budgeting, financial analysis, and cash management (Hisrich et al., 2017). Entrepreneurs with sound financial skills are better equipped to navigate the complexities of financial planning and ensure the financial viability of their ventures. Marketing skills, as emphasized in Comprehensive Entrepreneurship Skills, enable entrepreneurs to develop strategic marketing plans, identify target markets, and effectively promote their offerings (Kuratko & Hodgetts, 2017). Proficiency in marketing is crucial for building brand awareness and attracting customers. Strategic thinking skills encourage entrepreneurs to adopt a long-term perspective, formulate a clear business vision, and identify growth opportunities (Shane & Venkataraman, 2000). Entrepreneurs with strategic thinking capabilities are more likely to chart a sustainable course for their ventures in a constantly evolving business environment. Lastly, risk management skills are integral to Comprehensive Entrepreneurship Skills, empowering entrepreneurs to identify, assess, and mitigate potential risks to their businesses (Kuratko & Hodgetts, 2017). Proficiency in risk management enhances a business's resilience and its ability to withstand unforeseen challenges.

RESEARCH METHOD

The data collection method in this research begins with conducting Focus Group Discussions (FGD) with 30 participants representing academics and entrepreneurship

practitioners to identify the factors shaping the entrepreneurship ecosystem. Subsequently, a questionnaire is distributed to 200 respondents who are students. Respondents assess the questionnaire based on provided instructions. This study employs factor analysis. Factor analysis is a technique used to identify factors capable of explaining the relationships or correlations among various observed independent indicators. Factor analysis extends the principal component analysis and aims to identify a relatively small number of factors that can account for a large amount of interrelated variables. Thus, variables within a given factor exhibit high correlations, while correlations with variables from other factors are relatively low. Each variable group represents a fundamental construct referred to as a factor. To enhance factor interpretability, transformations on the loading matrix must be performed.

The primary objective of factor analysis is to elucidate the structural relationships among multiple variables in the form of latent factors or constructs. The resulting factors are random quantities that were previously unobservable, unmeasurable, or directly determinable. Alongside this main objective, other goals include:

1. Reducing a substantial number of original variables to a smaller set of new variables, termed factors, latent variables, constructs, or formed variables.
2. Identifying relationships between the constituent variables of the factor or dimension and the resulting factors by examining the correlation coefficients between factors and their forming components. This form of factor analysis is referred to as confirmatory factor analysis.
3. Testing the validity and reliability of instruments through confirmatory factor analysis.

Exploratory factor analysis, or principal component analysis, is a factor analysis technique where the latent variables that will emerge are not predetermined prior to analysis.

Data validation aims to ascertain whether the outcomes of factor analysis can be generalized to the population. Consequently, upon the emergence of factors, the researcher develops new hypotheses based on the analysis results.

RESEARCH FINDINGS

Results from Focus Group Discussion

The findings from the Focus Group Discussion concerning the analysis of the entrepreneurship ecosystem within the university environment and the support provided by the

university to foster entrepreneurship revealed 30 supportive elements for the entrepreneurship ecosystem within the university environment. These elements are as follows:

1. Grant funding provision
2. Entrepreneurship seminar arrangements
3. Teaching by certified entrepreneurship faculty
4. Collaboration with financial institutions for business instalment programs
5. Organization of expos for student entrepreneurs
6. Availability of entrepreneurship books in the campus library
7. Provision of spaces for entrepreneurial practices
8. Availability of a halal centre institution on campus
9. Role of academic advisors in promoting entrepreneurship
10. Internship programs with business practitioners
11. Implementation of entrepreneurship competency assessments
12. Availability of Intellectual Property Rights institutions on campus
13. Teaching related to business financial management
14. Role of cooperatives on campus
15. Mentoring by mentors/practitioners
16. Provision of materials related to business ideas
17. Entrepreneurship learning culture within the campus
18. Availability of consultation hours with entrepreneurship faculty
19. Creation of trial products
20. Validation of trial products with consumers
21. Ability of faculty to encourage students to participate in business competitions
22. Availability of business incubators on campus
23. Availability of Career Centre institution on campus
24. Availability of national and international entrepreneurship-related seminars
25. Role of entrepreneurial alumni association
26. Support from parents/family for entrepreneurship
27. Permission for using laboratories to test products
28. Addition of entrepreneurship courses tailored to each program
29. Direct practice in the business world
30. Teaching related to digital marketing

Subsequently, the researcher distributed these 30 questions to 200 student respondents at Universitas Muhammadiyah Sumatera Utara. Respondents' answers to these questions were expressed on a Likert scale as follows:

1. Signifies very low/poor/very weak
2. Signifies low/poor/weak
3. Signifies moderate
4. Signifies high/good/strong
5. Signifies very high/excellent/very strong

Factor Analysis Results

The outcome of the Kaiser-Meyer-Olkin (KMO) test in this stage was 0.469, which is less than (<) 0.5, indicating unacceptability. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy assesses the adequacy of the sample by comparing the observed correlation coefficients with their partial correlation coefficients. According to Wibisono (2003), the suitability criteria for factor analysis application are as follows:

1. A KMO value between 0.9 - 1.0 indicates a very satisfactory level.
2. A KMO value between 0.8 - 0.9 indicates a satisfactory level.
3. A KMO value between 0.7 - 0.8 indicates a moderate level.
4. A KMO value between 0.6 - 0.7 indicates an adequate level.
5. A KMO value between 0.5 - 0.6 indicates a less satisfactory level.
6. A KMO value less than 0.5 is considered unacceptable.

Table 1. KMO and Bartlett's Test Results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**,469**
Bartlett's Test of Sphericity	Approx. Chi-Square	458,116
	Df	435
	Sig.	,214

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

According to Santoso (2002), the value of Measure of Sampling Adequacy (MSA) ranges from 0 to 1, with the criteria used for interpretation as follows:

1. If MSA = 1, then the variable can be predicted without error by other variables.
2. If MSA is greater than 0.5, then the variable can still be predicted and further analyzed.
3. If MSA is less than 0.5 and/or approaches zero (0), then the variable cannot be further analyzed or may be removed from the set of variables.

Subsequently, to examine the correlation between independent variables, attention can be given to the Anti-Image Matrices table. The processed data yielded an Anti-Image Matrices, as presented in the following table. Based on the results obtained using the Anti-Image Matrices, the following conclusions can be drawn:

Tabel 2. Anti-Image Matrices

Questions No.	Factors	MSA
Q1	Grant funding provision	,389[a]
Q2	Entrepreneurship seminar arrangements	,417[a]
Q3	Teaching by certified entrepreneurship faculty	,491[a]
Q4	Collaboration with financial institutions for business instalment programs	,411[a]
Q5	Organization of expos for student entrepreneurs	,500[a]
Q6	Availability of entrepreneurship books in the campus library	,464[a]
Q7	Provision of spaces for entrepreneurial practices	,481[a]
Q8	Availability of a halal centre institution on campus	,482[a]
Q9	Role of academic advisors in promoting entrepreneurship	,496[a]
Q10	Internship programs with business practitioners	,520[a]
Q11	Implementation of entrepreneurship competency assessments	,492[a]
Q12	Availability of Intellectual Property Rights institutions on campus	,485[a]
Q13	Teaching related to business financial management	,529[a]
Q14	Role of cooperatives on campus	,499[a]
Q15	Mentoring by mentors/practitioners	,501[a]
Q16	Provision of materials related to business ideas	,519[a]
Q17	Entrepreneurship learning culture within the campus	,473[a]
Q18	Availability of consultation hours with entrepreneurship faculty	,391[a]
Q19	Creation of trial products	,534[a]
Q20	Validation of trial products with consumers	,525[a]
Q21	Ability of faculty to encourage students to participate in business competitions	,395[a]
Q22	Availability of business incubators on campus	,483[a]
Q23	Availability of Career Centre institution on campus	,418[a]
Q24	Availability of national and international entrepreneurship-related seminars	,424[a]
Q25	Role of entrepreneurial alumni association	,433[a]
Q26	Support from parents/family for entrepreneurship	,476[a]
Q27	Permission for using laboratories to test products	,476[a]
Q28	Addition of entrepreneurship courses tailored to each program	,398[a]
Q29	Direct practice in the business world	,521[a]
Q30	Teaching related to digital marketing	,518[a]

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

The table above indicates that the values of Measure of Sampling Adequacy (MSA) (observed from the diagonal values in the Anti-Image Correlation) are >0.5 (Q5, Q10, Q13, Q15, Q16, Q19, Q20, Q29, and Q30), signifying that the values of these variables can be predicted and further analyzed. On the other hand, variables Q1, Q2, Q3, Q4, Q6, Q7, Q8, Q9, Q11, Q12, Q14, Q17, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, and Q28 cannot be subjected to further analysis or should be excluded from the variable set.

After re-inputting the data, including only variables (Q5, Q10, Q13, Q15, Q16, Q19, Q20, Q29, and Q30) with MSA values greater than 0.5, these variables can still be predicted and subjected to further analysis.

The computed result indicates that the Barlett Test of Sphericity yields a value of 28.969 at a significance level of 0.791, signifying that there exists non-significant correlation among variables. Furthermore, the calculated KMO value of 0.505 indicates that the level of suitability for Factor Analysis falls into the category of less satisfactory but acceptable.

Table 3. KMO and Bartlett's Test Results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**,505**
Bartlett's Test of Sphericity	Approx. Chi-Square	28,969
	Df	36
	Sig.	,791

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

To observe the relationship between the original variables and the formed variables, refer to the communalities table as presented below:

Table 4. Communalities Results

	Initial	Extraction
Q5	1,000	,675
Q10	1,000	,381
Q13	1,000	,512
Q15	1,000	,469
Q16	1,000	,489
Q19	1,000	,360
Q20	1,000	,543
Q29	1,000	,666
Q30	1,000	,630

Extraction Method: Principal Component Analysis.

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

Communalities are used to observe the percentage contribution of a variable to the formed factors. Based on the table above, it can be determined that for Factor Q5, the value is 0.675, indicating that approximately 67.5% of the variance in variable Q5 can be explained by the formed factor. Similarly, this applies to other variables, with the principle that a higher communality value of a variable signifies a closer relationship to the formed factor.

In determining new factors, this can be achieved by examining the values in the Initial Eigenvalues table under the Total Variance Explained section. For a clearer understanding, please refer to the following table:

Table 5. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1,308	14,539	14,539	1,308	14,539	14,539	1,244	13,824	13,824
2	1,216	13,511	28,050	1,216	13,511	28,050	1,218	13,534	27,358
3	1,104	12,268	40,318	1,104	12,268	40,318	1,161	12,900	40,257
4	1,096	12,177	52,495	1,096	12,177	52,495	1,101	12,238	52,495
5	,940	10,446	62,941						
6	,921	10,232	73,173						
7	,881	9,794	82,967						
8	,794	8,826	91,793						
9	,739	8,207	100,000						

Extraction Method: Principal Component Analysis.
Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

Determining the number of factors formed can be observed from the magnitude of their Eigenvalues. The Total Variance Explained table indicates that there are 4 factors with total eigenvalues > 1, indicating that these factors can be retained. Meanwhile, factors starting from the fifth have eigenvalues < 1, and thus cannot be retained.

Each factor has a variance of 1, with a total variance of 9 x 1 = 9. If these 9 factors are summarized into components, the variance explained by each component is as follows:

1. Component 1: 1.308: 9 x 100% = 14.53%. Component 1 can represent 14.53% of the variability of the original nine factors.
2. Component 2: 1.216: 9 x 100% = 13.51%. Component 2 can represent 13.51% of the variability of the original nine factors.
3. Component 3: 1.104: 9 x 100% = 12.26%. Component 3 can represent 12.26% of the variability of the original nine factors.
4. Component 4: 1.096: 9 x 100% = 12.17%. Component 4 can represent 12.17% of the variability of the original nine factors.

Thus, it can be concluded that these four components can collectively represent the diversity of the original factors. The next step involves factor grouping, which can be observed in the component matrix. The component matrix contains factor loadings (correlation values) between each factor and the analyzed variables. Factor loadings determine factors worthy of consideration with significant values > 0.5. The component matrix table can be found in the following table:

Tabel 6. Component Matrix[a]

	Component			
	1	2	3	4
Q13	,637	-,165	,142	,242
Q16	,525	-,303	-,253	-,241
Q15	,520	,263	,358	-,028
Q19	-,351	-,229	,303	,304
Q30	,202	-,729	,226	,081
Q5	,272	,256	-,720	,131
Q10	,335	,357	,363	-,100
Q29	-,072	,187	,234	-,756
Q20	,038	,465	,211	,530

Extraction Method: Principal Component Analysis.
a. 4 components extracted.
Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

The Component Matrix table indicates that the 9 original factors will be distributed across Component 1, Component 2, Component 3, and Component 4 (new factors). In the process of creating the component matrix, if correlation values are found to be < 0.5, a re-rotation is necessary.

The objective of factor rotation is to address situations where difficulties arise in determining which variables should be allocated to a specific factor. This is particularly relevant when the factorization process yields only one factor or when the suitability of including a certain factor becomes uncertain. In this study, factor rotation was performed using the varimax method. The Rotated Component Matrix table is provided in the following:

Table 7. Rotated Component Matrix

	Component			
	1	2	3	4
Q30	**,699**	-,072	-,354	,101
Q16	**,572**	,058	,384	-,103
Q13	**,468**	,430	,079	,319
Q15	,086	**,677**	,053	-,012
Q10	-,087	**,600**	,009	-,115
Q5	-,072	-,123	**,762**	,273
Q19	-,048	-,160	-,539	**,203**
Q29	-,102	**,172**	-,013	-,791
Q20	-,419	,368	-,088	**,474**

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

Each initial factor can be allocated to one of the four emerging factors, and the outcomes are visible in Component 1 table, Component 2 table, Component 3 table, and Component 4 table presented below:

Table 8. Component 1

No.	Initial Factors	Loading Factors
1	Q30 Teaching related to digital marketing	**,699**
2	Q16 Provision of materials related to business ideas	**,572**
3	Q13 Teaching related to business financial management	**,468**

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

The three factor variables presented in Component 1 table are attributed to Component Factor 1. This is due to the fact that these three factor variables exhibit a strong correlation with Factor 1. The first component or factor holds the smallest % of Variance, which amounts to 14.539%. As a result, this factor becomes the fourth in line, influencing the entrepreneurial ecosystem within the university environment and the forms of support extended by the university to foster entrepreneurial endeavors, as indicated by Q30 (Digital marketing-related learning), Q16 (Provision of business idea-related material), and Q13 (Financial management in business operations).

Table 9. Component 2

No.	Initial Factors	Loading Factors
1	Q15 Mentoring by mentors/practitioners	**,677**
2	Q10 Internship programs with business practitioners	**,600**
3	Q29 Direct practice in the business world	**,172**

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

The three factor variables presented in Component 2 table are associated with Component Factor 2. This is attributed to the substantial correlation exhibited by these three factor variables with Factor 2. The second component or factor comprises a % of Variance equal to 28.050%, thereby becoming the third factor that influences the entrepreneurial ecosystem within the university environment and the various forms of support provided by the university to foster entrepreneurship, as indicated by Q15 (Guidance by mentors/practitioners), Q10 (Implementation of internship programs with business practitioners), and Q29 (Direct engagement in business practices).

Table 10. Component 3

No.	Initial Factors	Loading Factors
1	Q5 Organization of expos for student entrepreneurs	**,762**

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

The factor variable in Component 3 table is allocated to Component Factor 3. This decision is based on the strong correlation observed between the factor variable and Factor 3. The third component or factor constitutes a % of Variance equal to 40.318%, solidifying its

role as the third factor influencing the entrepreneurial ecosystem within the university environment and the range of support provided by the university for nurturing entrepreneurship, as indicated by Q5 (Organizing expos for student entrepreneurs).

Table 11. Component 4

No.	Initial Factors	Loading Factors
1	Q19 Creation of trial products	**,203**
2	Q20 Validation of trial products with consumers	**,474**

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 23.0

The two factor variables presented in Component 4 table are attributed to Component Factor 4. This decision is based on the substantial correlation observed between the two factor variables and Factor 4. The fourth component or factor accounts for a % of Variance equal to 52.495%, making it the primary factor influencing the entrepreneurial ecosystem within the university environment and the various forms of support provided by the university to foster entrepreneurship, as indicated by Q19 (Creating prototype products) and Q20 (Validating prototype products with consumers).

Please note that there seems to be a minor inconsistency in the text. You mentioned the first factor influencing, but based on the context, it should be the fourth factor influencing.

The two factor variables presented in Component 4 table are attributed to Component Factor 4. This decision is based on the strong correlation observed between the two factor variables and Factor 4. The fourth component or factor accounts for a % of Variance equal to 52.495%, making it the primary factor influencing the entrepreneurial ecosystem within the university environment and the various forms of support provided by the university to foster entrepreneurship, as indicated by Q19 (Creating prototype products) and Q20 (Validating prototype products with consumers).

There are four factors that influence the entrepreneurial ecosystem within the university environment and the forms of support provided by the university for nurturing entrepreneurship:

1. Learning Process Factor:

a. Q30 (Learning related to digital marketing)

b. Q16 (Provision of business idea-related material)

c. Q13 (Financial management in business operations)

This factor focuses on the learning process to enhance participants' entrepreneurship competencies, covering topics such as Generating Business Idea, Design Thinking, Business Plan and Business Model Canvas, Digital Marketing, and Financial Analysis.

2. Entrepreneurship Internship Factor:

a. Q15 (Guidance by mentors/practitioners)

b. Q10 (Implementation of internship programs with business practitioners)

c. Q29 (Direct engagement in business practices)

This factor pertains to an integrated learning and working program with business practitioners, where participants work and learn simultaneously under the guidance of mentors/practitioners.

3. Expo Factor:

a. Q5 (Organizing expos for student entrepreneurs)

This factor involves organizing expos where participants can showcase their products and connect with potential investors through business matching.

4. Prototyping Factor:

a. Q19 (Creating prototype products)

b. Q20 (Validating prototype products with consumers)

This factor emphasizes prototyping and validation processes for innovative product creation, involving validation from consumers and testing prototypes to ensure their suitability for commercialization.

Based on the content analysis provided above, several conclusions can be drawn:

1. The role of public speaking is crucial for micro, small, and medium-sized enterprise (MSME) entrepreneurs. It's not only important for them to possess effective public speaking skills, but it's also essential for entrepreneurs to understand the factors that contribute to strengths, weaknesses, opportunities, and threats. These considerations are vital when engaging in public speaking (Noor et al., 2020).

2. The quality of an entrepreneur's aspirations and their mental fortitude significantly impact their entrepreneurial capacity in the pursuit of success in the globalized era. Strong entrepreneurial aspirations and mental attitudes enhance an entrepreneur's ability to achieve high-performance entrepreneurship (Prasetyo, 2020).

3. Team collaboration plays a pivotal role in enhancing performance. Effective teamwork aids in solving tasks and challenges, leading to improved employee performance. Additionally, a sense of enthusiasm towards work acts as a driving force,

motivating employees to perform at their best and consequently improving their performance (Kusuma & Susanto, 2018).

4. Entrepreneurial leadership and entrepreneurial culture have a positive and significant impact on customer value and competitive advantage. These factors contribute to the overall success of a business (Sundari & Mawardi, 2020).

5. A good leader is one who possesses a vision for achieving goals while considering the well-being of their subordinates (Bahruddin et al., 2019).

From the content analysis presented, it can be concluded that students also need to participate in boot camps to enhance their skills in public speaking, teamwork, and leadership. This effort aligns with the goal of improving the quality of graduates, specifically their readiness for the workforce. In today's professional landscape, proficiency in public speaking, teamwork, and leadership is crucial, both in the corporate world and during the entrepreneurial phase of business experience.

CONCLUSION

Based on the results of interviews, focus group discussions, questionnaires that ultimately served as inputs for conducting factor analysis, coupled with content analysis, the design of an entrepreneurship learning model supported by the campus entrepreneurship ecosystem and business incubator to stimulate the down streaming and commercialization of products and services generated by students is formulated as follows: 1). Entrepreneurship Learning Process: This process is aimed at enhancing the entrepreneurial competencies of participants, encompassing topics such as Generating Business Ideas, Design Thinking, Business Plans and the Business Model Canvas, Digital Marketing, and Financial Analysis. 2). Entrepreneurship Internship: This program integrates learning and working experiences for participants engaged in entrepreneurial activities. The term "integrated learning and working program" is used because during the internship, participants engage in both work and learning in an integrated manner. 3). Bootcamp for Students: Students will partake in a bootcamp with the objective of honing skills in Public Speaking, Teamwork, and Leadership. This effort aligns with the enhancement of graduate quality, specifically their preparedness for the job market. In the current landscape, proficiency in Public Speaking, Teamwork, and Leadership holds significant importance, both within the realm of employment and entrepreneurship. 4). Prototyping Phase: Students will engage in prototyping to develop innovative products, validate them with consumers, and conduct product trials. This iterative process ensures the viability of

products for commercialization. 5). Exposition (Expo): The Expo serves as a platform for participants to showcase their products and engage with potential investors. The effectiveness of this model's development can be evaluated through the significant differences in learning outcomes before and after the implementation of entrepreneurship education based on local potential (Sari, et al., 2017).

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ANNEXES

Table 1: Original Data.

NO	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
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