



# Geodupreneurship and Educational Innovation: Exploring the Need for Geography Education-Based Entrepreneurship Learning Materials

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## ABSTRACT

Digital transformation in the Industrial Revolution 5.0 requires higher education to produce graduates who are adaptive, creative, and possess entrepreneurial capacity. Geography education has strategic potential in supporting these goals through a geodupreneurship approach that integrates spatial literacy and entrepreneurial competencies. This study aims to identify the need for geography education-based entrepreneurship learning materials through a mixed-methods approach, incorporating both quantitative and qualitative descriptive analyses. The results show that 64.3% of students require the integration of real-life case studies, 54.8% desire interactive digital innovation, and 45.2% experience difficulties converting spatial data into business opportunities. These findings highlight the limitations of current learning materials, which remain theoretical and fail to address the contextual needs of 21st-century learning. Based on the analysis results, an adaptive geodupreneurship learning material model was designed that combines a project-based approach, digital technology, and inspirational narratives as a strategy to strengthen geography-based entrepreneurial competencies that are relevant, applicable, and sustainable.

**Keywords:** geodupreneurship, learning innovation, learning materials

## INTRODUCTION

The era of technological disruption and digital transformation has shifted the paradigm of higher education, focusing on strengthening academic competencies and developing entrepreneurial capacity. Universities are required to produce graduates capable of adapting to the increasingly complex and competitive dynamics of the workplace [1], [2]. Synergy between education and entrepreneurship is a strategic need in facing the industrial revolution 5.0, which emphasizes human-technology collaboration [3]. This condition requires an innovative approach in developing learning materials that are responsive to changes in the times that demand high levels of creativity and adaptability [4].

Geography, as a discipline that integrates spatial, environmental, and socio-economic dimensions, has excellent potential to serve as a foundation for sustainable entrepreneurship. Geography provides a comprehensive perspective in identifying local potential that can be designed as sustainable business opportunities based on local resources [5], [6]. The geodupreneurship approach offers innovative solutions through the use of geographical knowledge for the development of a sustainable creative economy [7]. However, the implementation of this approach in the higher education curriculum still faces obstacles,

especially in the availability of contextual and applicable learning materials [8].

Educational innovation through the integration of entrepreneurship in geography learning is in line with the 2030 Sustainable Development Goals (SDGs) agenda, especially the fourth goal on quality education and the eighth goal on decent work and economic growth [9]. Entrepreneurship education integrated into academic disciplines increases the creativity and competitiveness of graduates [10]. Studies reveal that a context-specific approach to entrepreneurship education is more effective in building entrepreneurial motivation [11]. However, studies on integrating entrepreneurship in geography education are still minimal, especially regarding the availability of applicable and contextual learning materials.

The availability of learning materials that integrate entrepreneurship into geography education can be a strategic solution to address these limitations. Previous research has identified the need to develop learning materials that can equip students with the skills to analyze geographic potential as a business opportunity [12]. Similar findings reveal the importance of needs analysis in developing entrepreneurship learning materials [13]. However, no research has comprehensively analyzed the need for geodupreneurship learning materials in Indonesia's geography education context. This research gap

underscores the need to identify the specific requirements for such innovative learning materials.

Needs analysis is a critical foundation in developing learning materials that are responsive to the demands of 21st-century competencies [14], [15]. The systematic process of identifying needs enables the design of materials that are appropriate to the characteristics of students and the needs of the industrial world [16]. A comprehensive needs analysis is the key to the successful development of innovative learning materials [17]. Without in-depth analysis, learning materials risk becoming irrelevant and less effective in building student competencies. The information obtained from this analysis serves as a foundation for determining the optimal structure, content, and delivery methods of learning materials [18], [19]. Accuracy in identifying needs will ensure that the learning materials developed can benefit students the most.

Analyzing the need for geodupreneurship learning materials is a crucial step to ensure that learning materials are aligned with industrial developments and community needs [20]. This study outlines an in-depth analysis of the need to develop geodupreneurship learning materials as a strategic approach combining geographical insight with entrepreneurial innovation. This approach aims to design learning materials that can encourage students' professional adaptation to the dynamics of geography-based industries. This study aims to identify learning needs that form the basis for developing an adaptive and relevant geodupreneurship learning material development plan. This analysis was conducted to ensure that the geodupreneurship learning material plan is highly relevant to industrial developments, community needs, and professional demands in the field of geography [21]. The results are expected to contribute to the development of a curriculum that is applicable and relevant to the needs of the workplace, supporting the achievement of sustainable development goals.

## RESEARCH METHODS

This research uses a mixed-methods approach that integrates quantitative and qualitative methods descriptively [22]. The quantitative approach was chosen to obtain an objective and systematic picture regarding the need for entrepreneurship-based learning materials in geography education, while the qualitative approach was used to dig into in-depth information regarding the context and nuances of developing geodupreneurship learning materials [23], [24]. The population in this study consisted of students from the Geography Education study program at Malang State University who had taken the Geoedupreneurship course. The sample was determined using the Slovin formula with a stratified random sampling method, referring to the characteristics of the year of entry, with a margin of error of 0.1, resulting in a minimum of 78 respondents [25], [26]. In addition, this research also involved lecturers who teach the Geoedupreneurship course in the Geography Education undergraduate study program at Malang State University.

The research instruments consisted of three main types. First, a curriculum analysis guide for the geodupreneur course refers to the course's learning outcomes and graduate competency standards. Second, a semi-structured interview guide for lecturers covered material suitability, learning constraints, and the need for innovative learning materials development. Third, a specially designed needs analysis questionnaire using a 1-4 Likert scale with indicators measuring aspects of geodupreneurship and educational innovation [27]. This questionnaire is designed in the form of a checklist using a Likert scale (1-4), which contains questions related to student learning conditions and student needs in developing learning materials [28]. In addition, the questionnaire included a suggestion or feedback section to allow respondents to express their opinions more openly. It consisted of 15 structured questions and an open-ended response section to accommodate constructive feedback from respondents.

**Table 1.** Variables for Analysis of Learning Material Needs [29], [30]

Question Indicator	Number	Number of Question Items
Characteristics of student learning types	1, 2	2
Achievement of Geoedupreneurship Learning Outcomes against the achievement standards of the Geography Education Study Program	3, 4	2
Material that experiences obstacles to achieving learning outcomes	5, 6	2
Characteristics of the learning materials used	7, 8, 9	3
The need for entrepreneurship-based learning materials for geography education	10, 11, 12, 13, 14, 15	6

Table 1 presents a research instrument designed to comprehensively map the current state of geodupreneurship learning. Each indicator is arranged sequentially to allow researchers to explore the relationship between student characteristics, the achievement of learning objectives, and the effectiveness of the teaching materials used. The layered

question structure facilitates more in-depth data collection on students' constraints and needs for relevant teaching materials. This arrangement pattern enables researchers to trace the logical flow from identifying learning characteristics to analyzing the needs for developing teaching materials based on geographical entrepreneurship, thereby ensuring a

strong and interconnected empirical basis for the resulting analysis.

The collected data were analyzed using quantitative descriptive analysis methods. This analysis was done by converting quantitative data into a percentage format [31]. Next, the data that has been transformed into percentage form is interpreted and presented in the form of a descriptive narrative [32]. This approach aims to provide a deeper understanding of the actual conditions in analyzing the needs for developing entrepreneurship-based learning materials

in geography education. Quantitative data are processed by applying the percentage formula to determine the response tendency of participants [33]

$$P = \frac{F}{n} \times 100\%$$

Information:

P : Percentage of responses

F : Response frequency

n : Number of respondents

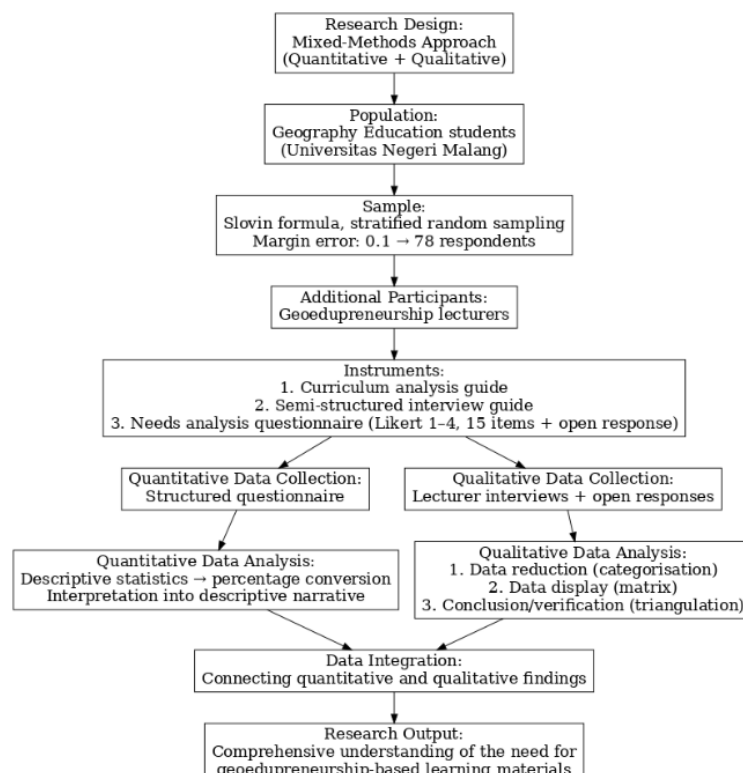
The results of the percentage calculation are then interpreted as follows:

**Table 2.** Interpretation of analysis results [34], [35].

Scale Value	Evaluation	Percentage (%)	Category
4	Strongly Agree	76 – 100	Very Good
3	Agree	51 – 75	Good
2	Disagree	26 – 50	Poor
1	Strongly Disagree	0 – 25	Very Poor

Table 2 explains the guidelines for interpreting the analysis results used to assess respondents' level of agreement with each question in the research instrument. The rating scale consists of four levels representing the intensity of responses, ranging from strongly disagree to agree strongly. A percentage range between 0 and 100 converts quantitative results into qualitative categories, allowing each value to be interpreted objectively and accurately. This classification helps researchers determine the extent to which respondents positively assessed the measured aspects, while also facilitating the analysis process in identifying data trends and the strengths and weaknesses of each research indicator.

Qualitative data were analyzed using content analysis techniques through three procedural stages. First, data was reduced by grouping interview transcripts and open-ended responses into thematic categories. Second, data presentation was carried out using a needs categorization matrix. Third, verification conclusions were drawn through source triangulation by comparing the results of lecturer interviews, open-ended student responses, and the quantitative analysis results. The integration of quantitative and qualitative data was carried out through a connecting technique, comparing and linking findings from both types of data to gain a comprehensive understanding of the needs for geoduprenurship learning materials.



**Figure 1.** Research flow diagram

This research framework is structured logically to ensure each stage is interconnected and yields a

deep understanding of the needs of geoduprenurship teaching materials. The

researchers began the process by emphasizing a mixed approach as the primary foundation for complementing quantitative and qualitative data. A well-planned sampling strategy demonstrated efforts to obtain proportional representation of respondents according to population characteristics. The instruments used were then designed in an integrated manner to capture both factual aspects through questionnaires and in-depth context through interviews. All collected data were analyzed using a coherent flow so that qualitative findings reinforced each quantitative calculation result. Connecting the two data sources resulted in a comprehensive conclusion, accurately and applicably illustrating the absolute need for developing entrepreneurship-based teaching materials for geography education.

## RESULT AND DISCUSSION

### 1. Integration of geodupreneurship into the Learning Outcomes of Geography Education Graduates

The integration of geodupreneurship into the geography education curriculum demonstrates a strong conceptual link between spatial analytical competencies and entrepreneurial skills. An analysis of the curriculum documents in the Geography Education Study Program at the State University of Malang shows significant alignment with the Learning Outcomes Standards, which emphasize mastery of geospheric concepts. This curricular approach broadens the meaning of geography learning, focusing not only on conceptualization but also on fostering adaptive skills to identify poverty-based economic potential. The integration of entrepreneurship within higher education significantly contributes to increasing the relevance of education to national development demands [36].

The integration between geodupreneurship and graduate learning outcomes is achieved through strengthening the applied dimension of geographic knowledge. Competence in analyzing geospheric phenomena develops into the ability to design business models used to local potential. The shift from theoretical understanding to applied skills demonstrates a transformation process oriented toward economic solutions based on geographic data. This approach makes contextual entrepreneurship education an effective medium for developing professional competencies relevant to the needs of society and the world of work [37].

The analysis of learning plans indicates that graduate learning outcomes are directed toward the ability to design, implement, and disseminate business activities based on geographic potential. This pattern of achievement suggests that contextually oriented entrepreneurship education can improve the quality of learning and provide added value to graduate competencies [38]. This integration highlights the strategic role of geography education in developing professionals

who can adapt to the needs of spatially based and multidimensional industries.

The link between geodupreneurship and students' analytical skills is evident in academic activities that require spatial data processing to support business decision-making. Students are encouraged to analyze regional potential, map local resources, and evaluate location-based business opportunities. These activities foster systematic, evidence-based reasoning and develop critical thinking skills. This perspective is in line with previous research, which states that contextual education encourages a sharper increase in spatial analysis skills compared to general approaches [39]. Learning outcomes that emphasize spatial analysis and environmental interpretation have strong potential to become the foundation for geography-based entrepreneurship learning.

The integration of geodupreneurship contributes to the improvement of graduates' innovative competencies. Students are encouraged to develop products that leverage local potential, design business models tailored to regional characteristics, and create spatially based marketing strategies. These activities strengthen the innovation orientation as a benchmark for the success of entrepreneurship education. Previous research has shown that entrepreneurship programs that emphasize creativity and innovation have a positive impact on students' readiness to face market dynamics [40]. These findings underscore that strengthening innovation elements in geography learning acts as a catalyst for developing adaptive and solution-oriented graduates.

Geodupreneurship's contribution to mastering applied competencies is evident in students' ability to design business plans, analyze business feasibility, and develop strategy implementation based on spatial analysis. Learning activities that emphasize hands-on experience play a crucial role in fostering students' self-confidence and readiness to face the realities of the workplace. A curriculum that emphasizes entrepreneurial practices based on real-world experiences has been shown to strengthen the connection between academic theory and field application [41]. These findings confirm that the strength of the application dimension makes Geography Education graduates more relevant to the needs of society and industry.

The primary factor underlying this relevance lies in the curriculum design, which emphasizes analytical skills and environment-based problem-solving skills. These abilities naturally align with entrepreneurial competencies, particularly in spatial data-based decision-making. The implementation of a spatial analysis-based curriculum encourages students' reflective and application skills, enabling them to connect the



results of their geography studies with the potential for developing a location-based creative economy [42].

The integration of geodupreneurship also strengthens graduates' job readiness by developing an entrepreneurial mindset that complements technical geography competencies. Analysis of curriculum documents reveals that the integration of entrepreneurial aspects provides a systematic foundation for developing the ability to apply spatial theory to business innovations. The entrepreneurial mindset developed through formal education plays a crucial role in enhancing graduates' adaptability to social and economic change [43]. The advantage of geodupreneurship lies in its ability to link spatial dimensions to business practices, resulting in more contextual and applicable learning products.

Research limitations are evident in the depth of the semester lesson plan documents that serve as the basis for the analysis. The structure of the Entrepreneurship course lesson plan document at the Geography Education Study Program, State University of Malang, does not fully explicitly display the geodupreneurship dimension in the learning objectives or learning activity design. The integrative elements between spatial analysis and entrepreneurship remain conceptual and have not been operationally measured through detailed achievement indicators. Several sections of the lesson plan also demonstrate a dominance of theoretical aspects over strengthening students' empirical experience in managing geography-based entrepreneurial projects. These conditions indicate that the integration process still requires further development in the form of implementation guidelines, such as adjusting project assignments, performance-based assessments, and expanding local industry partner networks. Nevertheless, these findings provide constructive development direction for curriculum refinement to better represent the holistic concept of geodupreneurship and orient it toward community needs.

Field-specific learning yields higher effectiveness than a general entrepreneurial approach [44]. This integration strengthens the learning outcomes of Geography Education graduates in analytical, innovative, and applied aspects. The implementation of a spatial entrepreneurship-based curriculum has implications for increasing the relevance of graduates to job market needs, which demand a combination of multidisciplinary skills. It emphasizes the importance of developing comprehensively integrated learning materials.

## **2. Analysis of Geodupreneurship Learning Material Needs in the Learning Process**

Analysis of the learning material needs for geodupreneurship is a fundamental step in

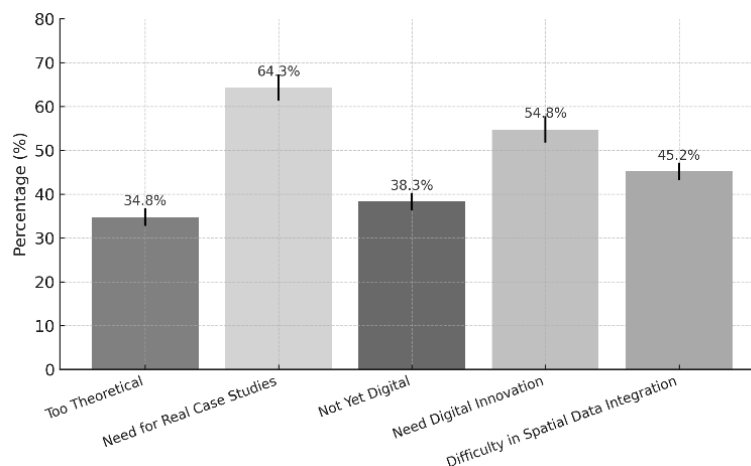
designing learning materials that align with student needs and the demands of 21st-century learning. The analysis approach is comprehensive, involving a review of curriculum documents, an evaluation of existing learning materials, and in-depth interviews with lecturers. The curriculum review provides a conceptual basis for integrating established learning outcomes with the actual conditions of lecture implementation. Meanwhile, the results of the student characteristics identification reveal diverse learning preferences, cognitive styles, and barriers to understanding concepts related to geography-based entrepreneurship. Evaluation of available learning materials provides an opportunity to assess the extent to which learning content fosters applied thinking skills. Lecturer perspectives, obtained through interviews, also enrich the understanding of the realities of learning, including practical obstacles that arise during the delivery process. This multi-method approach enables a comprehensive and accurate needs analysis as a foundation for developing contextual and applicable geodupreneurship learning materials.

An analysis of student perceptions revealed that 34.8% of respondents found the learning materials too theory-oriented, thereby providing insufficient opportunities for mastering practical skills. Sixty-four percent of respondents expected the integration of real-life case study-based projects into the learning materials. These data demonstrate that the learning materials remain conceptual in nature and do not fully encourage the internalization of contextual learning experiences. Students require facilitation to ensure that the learning process extends beyond knowledge transfer and develops applicable skills relevant to field conditions. Efforts to transform learning materials into learning instruments that guide students in developing practical skills based on empirical experience are considered crucial for strengthening geography-based entrepreneurial competencies [45]. This situation highlights the need to recontextualize learning materials as a bridge between entrepreneurial concepts and practice.

The still-abstract conceptual aspects impact students' ability to link spatial analysis with business opportunities. 45.2% of respondents reported experiencing difficulty transforming spatial data into business plans. The qualitative study indicated that this obstacle arises because the learning materials do not explicitly integrate geospatial analysis with business planning. Students need simple and easily accessible analysis tools to assist in the process of converting geographic data into applicable entrepreneurial ideas. The integration of digital literacy with entrepreneurial creativity is a crucial element in developing applied skills [47]. Therefore, learning

materials need to be structured to systematically connect geographic aspects with business strategies and support students' problem-solving skills in real-world situations. Other findings from the needs analysis emphasize the need for interactive digital-based innovations as learning support tools. As many as 38.3% of students assessed that the potential of digital technology has not been optimally utilized in the learning process. The majority of respondents, approximately 54.8%, recommended the use of learning videos, business simulations, and applications based on local

potential. These findings align with empirical studies that confirm the effectiveness of blended learning in increasing student engagement [46]. The use of digital technology through interactive platforms is expected to provide a dynamic, participatory, and adaptive learning experience that meets the needs of the modern generation of learners. Implementing a hybrid approach, which combines online activities and field projects, has the potential to strengthen digital literacy while enhancing the competitiveness of graduates.



**Figure 2.** Analysis of geodupreneurship learning material needs

The lecturers' perspectives also contributed significantly to mapping the needs for developing learning materials. Interviews indicated that learning materials require strengthening real-world case studies and intensive mentoring for entrepreneurship projects. Lecturers assessed that topics such as digital marketing, spatially based business potential analysis, and entrepreneurial characteristics require more contextual development. Presenting examples of businesses that leverage specific geographic potential, such as local product development or community-based ecotourism, is seen as enhancing the relevance of the learning experience. This finding aligns with research confirming the effectiveness of project-based learning in developing an innovative entrepreneurial mindset [48]. These lecturers' perspectives provide strategic direction for strengthening the application aspect in the development of geodupreneurship learning materials.

Further analysis revealed a gap between student expectations and the reality offered by existing learning materials. Students desired materials that were not only informative but also inspiring through narratives of entrepreneurial success stories based on local geographic potential. These narratives were deemed capable of fostering motivation, self-confidence, and entrepreneurial intentions, particularly in relation to geography. Previous studies have confirmed that entrepreneurial success stories can serve as an

effective motivational tool for students [49]. Learning materials containing narrative elements not only inspire but also enrich students' understanding of the entrepreneurial realities faced by communities in various regions.

Geodupreneurship learning materials are still conceptually oriented and do not fully provide practical guidance. This situation reflects the need to strengthen the practical aspect, particularly in activities that enable students to integrate spatial analysis with real-life projects. This trend demonstrates students' awareness of the importance of applying geography in the economic and social context of society. This need has implications for the demand for learning materials that not only present concepts but also guide students in an exploratory process based on field experience.

Factors influencing this situation relate to the characteristics of learning materials, which are still theory-centered and have not fully adapted to developments in project-based learning paradigms and digital technology. Students demonstrate a tendency to learn through exploration and real-world experiences, reflecting their readiness to apply geodupreneurship competencies directly. The need for practical guidance and interactive learning materials indicates a shift in learning orientation toward collaborative, reflective, and adaptive learning in response to socio-economic changes.

The analysis of learning material needs has strategic implications for the design of geodupreneurship learning in higher education. Learning materials should be designed to develop critical thinking skills, creativity, and digital literacy through analytical, collaborative, and reflective activities. Integrating technology into entrepreneurship learning has the potential to increase accessibility and enrich solution-based learning experiences [50]. An effective geodupreneurship curriculum must be applicable, integrative, and contextual in nature to prepare graduates who are adaptive to global challenges and sensitive to the geographic potential of their environment.

### 3. Adaptive and Relevant Geodupreneurship Learning Material Development Plan.

The design for developing geodupreneurship learning materials was created through a design approach that places the geographic context and entrepreneurial dynamics as the primary foundation. The development orientation is directed at integrating context-based entrepreneurship education principles that emphasize the relationship between open-ended materials and the spatial realities faced by students. This geographically context-based approach is expected to strengthen the internalization of entrepreneurship concepts that are in-depth, applicable, and aligned with the actual needs of the workplace. The developed design framework serves as a bridge between geographic theory and entrepreneurial practice, traversing systematic stages that emphasize the position of geodupreneurship as a learning model responsive to socio-economic and environmental changes.

The novelty of the geodupreneurship learning material design lies in the integration of entrepreneurial competencies with spatial literacy as core competencies. This integration provides a significant academic contribution because it has not been widely studied in research on the development of open-ended materials in other fields. Previous studies in non-geography fields have emphasized practice-based learning without considering the spatial dimension as a fundamental element [51]. Strengthening spatial literacy broadens understanding of the interrelationships between space, resources, and business opportunities, which can be identified through a geographic perspective. The integration of spatial literacy and entrepreneurial competencies presents a novel approach to innovative entrepreneurship learning grounded in a geographic context.

The structure of the learning materials is structured around five interconnected main elements: conceptual material, contextual case studies, discussion features, collaborative projects, and critical reflection. These five elements form a

unified learning cycle that gradually empowers students to develop entrepreneurial competencies. The stages begin with mastery of knowledge and progress to the ability to design creative solutions to real-world problems. This structure emphasizes that the learning materials serve as a means of developing analytical, critical, and creative skills [52]. This composition of interacting elements strengthens the integration of the cognitive, affective, and psychomotor aspects necessary for entrepreneurship education.

Digital components are a key component of the adaptive learning plan. The digital platform features a responsive interface, easily updated content, and interactive features, including business simulations and geospatial analysis tools. The integration of digital technology serves to expand access to learning, increase student participation, and enrich the learning experience through the exploration of spatial data that can be processed into concrete business ideas [53]. Geospatial analysis features provide students with the opportunity to convert spatial data into relevant business ideas; thus, digitalization plays a crucial role in ensuring the continuity and sustainability of the learning process amidst rapid technological change.

The results of the needs analysis indicate that the availability of geodupreneurship learning materials to support context-based learning is still limited. This situation suggests a gap between theoretical mastery and practical application skills. The limited availability of learning materials tailored to students' geographic locations, the scarcity of local case studies, and the suboptimal use of digital media are factors that hinder this. The design and development of learning materials must take into account the dynamic characteristics of geography, which constantly interact with spatial, social, and economic phenomena in society [54]. Adapting to these characteristics is the basis for strengthening the relevance between academic theory and practical needs.

A project-based approach is used as the primary strategy to strengthen the contextual aspects of open-ended materials. Students are guided to analyze regional potential and identify business opportunities based on local geographic characteristics. This strategy involves actively engaging students in decision-making, problem-solving, and the development of innovative ideas. Project-based learning models have been shown to enhance critical thinking and solution-based skills, as well as deepen theoretical understanding through empirical experience [55]. The implementation of this strategy produces students who not only understand the concept of geodupreneurship but are also able to design business models based on local potential that have applicative value.

Learning motivation is a crucial dimension in the design of learning materials. Narrative elements act as motivators, reference sources, and foster a spirit of continuous learning. Empirical findings indicate that intrinsic motivation, fostered by identifying with success stories, can increase entrepreneurial interest and strengthen commitment to self-development [56]. The integration of motivational elements highlights the importance of striking a balance between cognitive mastery and entrepreneurial character development.

The design of learning materials also emphasizes collaboration as a foundation for learning. Discussion and peer feedback provide a platform for exchanging ideas, fostering argumentative, negotiating, and academic communication skills. The structured interactive process strengthens students' ability to construct knowledge collectively. A collaborative approach has been shown to expand analytical capacity and develop social skills, essential assets for entrepreneurial activities [57]. This model fosters a participatory learning culture while strengthening a productive academic ecosystem.

The evaluation system is designed to assess students' conceptual understanding and application skills. Assessment instruments include conceptual quizzes, case study analysis, and field-based entrepreneurial projects. Authentically oriented evaluations provide a comprehensive snapshot of student competency development while enabling instructors to assess learning outcomes objectively. This project-based assessment offers students the opportunity to demonstrate their ability to apply geographic concepts to real-life business projects and assess their level of preparedness for the professional world.

The design for developing adaptive and relevant geoedupreneurship learning materials reflects a response to the demands of 21st-century learning, which emphasizes the integration of digital literacy, collaboration, and local context. Technology-based learning materials and real-world situations are expected to develop resilient graduates who can navigate complex economic and social dynamics. The contribution of this research lies in the innovative learning design that combines geographic and entrepreneurial dimensions within a coherent conceptual framework. These results affirm the position of geoedupreneurship as a strategic field of study in strengthening the competencies of geography education students.

Analysis of empirical data indicates that the development of this design was influenced by several factors, including lecturer and student aspirations for more applicable learning, the need for responsive digitalization of learning materials, and adjustments to graduate achievement standards for entrepreneurship courses in the

Geography Education study program at the State University of Malang. These factors emphasize the importance of academic stakeholder involvement in the success of adaptive learning designs. The active participation of both lecturers and students ensures that the learning design remains relevant to real-world needs and strikes a balance between theory and practice.

The strength of this research lies in its successful identification of real-world needs and the formulation of a learning design that bridges the gap between theory and practice. The use of a project-based approach and digitalized learning enriches the learning experience while increasing the relevance of learning outcomes to field needs. However, this research still has limitations. The prototype learning materials have not been widely tested at various levels of educational institutions, so their external validity still needs to be expanded. This limitation presents an opportunity for further research that could extend the testing area and adapt the learning materials to suit the diverse characteristics of various educational institutions.

The development plan for geoedupreneurship learning materials demonstrates a constructive direction in efforts to improve the quality of entrepreneurship-based geography learning. The resulting adaptive learning materials are expected to provide a means for students to creatively and ethically actualize the concept of geoedupreneurship in the context of sustainable regional development. Further research is recommended to expand the analysis of the effectiveness of implementing this learning material design at various levels of higher education and evaluate its impact on student job readiness. This development design provides a theoretical contribution to innovation in geography education and strengthens the synergy between geography and entrepreneurship as a response to the global challenges of the 21st century. The developed learning materials also have the potential to become a reference learning model for other educational programs that promote the integration of local context and entrepreneurial competencies.

## CONCLUSION

Integrating geoedupreneurship strengthens graduate learning outcomes by transforming spatial analytical competencies into the ability to design businesses based on local potential. However, its implementation is hampered by learning materials, which 34.8% of students consider too theoretical and not applicable, while 45.2% struggle to convert spatial data into business opportunities. The need for a contextual approach is extreme, with 64.3% of students requiring the integration of real-life case study-based projects. On the digital side, 38.3% consider technology utilization suboptimal, and 54.8% require innovative digital learning materials. Based on this needs analysis,



an adaptive and relevant learning material design was developed with an integrated structure, comprising five main components: conceptual materials, contextual case studies, collaborative discussion features, local potential-based projects, and critical reflection. This design emphasizes a project-based learning approach and is equipped with a digital platform that includes business simulations and user-friendly geospatial analysis tools to facilitate students in converting spatial data into sustainable business opportunities.

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## REFERENCES

- [1] M. I. Sholeh, Sokip, and A. Safi'i, "Strategi Hubungan Perguruan Tinggi Dengan Market Dan Bisnis Dalam Membangun Mutu Lulusan," *Compet. J. Educ.*, vol. 2, no. 4, pp. 235–264, Sep. 2023, doi: 10.58355/competitive.v2i4.42.
- [2] I. P. Herbert, A. T. Rothwell, J. L. Glover, and S. A. Lambert, "Graduate employability, employment prospects and work-readiness in the changing field of professional work," *Int. J. Manag. Educ.*, vol. 18, no. 2, p. 100378, Jul. 2020, doi: 10.1016/J.IJME.2020.100378.
- [3] C. Nagadeepa, K. P. J. Mukthar, E. Asnate-Salazar, J. Castillo-Picon, R. Y. Méndez, and S. Mory-Guarnizo, "Students Intention Towards Digital Entrepreneurship - Industry 5.0," in *The International Conference On Global Economic Revolutions*, Springer, 2024, pp. 233–249. doi: 10.1007/978-3-031-50518-8\_18.
- [4] C. C. Ledoh, L. Judijanto, A. Jumiono, A. Apriyanto, and H. Hakpantria, *Revolusi Industri 5.0: Kesiapan Generasi-Z dalam Menghadapi Persaingan Global*. PT. Sonpedia Publishing Indonesia, 2024.
- [5] M. Andersson and J. P. Larsson, "Geography and entrepreneurship," in *Handbook of regional science*, Springer, 2021, pp. 1361–1373.
- [6] E. Rasvanis and V. Tselios, "Do geography and institutions affect entrepreneurs' future business plans? Insights from Greece," *J. Innov. Entrep.*, vol. 12, no. 1, p. 3, Feb. 2023, doi: 10.1186/s13731-023-00266-3.
- [7] A. Wahyudi, T. Mutia, F. F. Maulana, and A. Maghfiroh, *Geoedupreneurship*, 1st ed., vol. 1. Malang, Jawa Timur Indonesia: PT. Literasi Nusantara Abadi Grup, 2024.
- [8] R. Sternberg, "Entrepreneurship and geography—some thoughts about a complex relationship," *Ann. Reg. Sci.*, vol. 69, no. 3, pp. 559–584, Dec. 2022, doi: 10.1007/s00168-021-01091-w.
- [9] M. Chekredji, V. Stefanovska, and K. Doda, *The Sustainable Development Goals - How to Accelerate Their Achievement in North Macedonia and Leave No One Behind*, vol. 1, no. 1. United Nations Development Programme North Macedonia (UNDP North Macedonia), 2023. [Online]. Available: <https://www.undp.org/north-macedonia>
- [10] Y. J. Wu and J. C. Chen, "Stimulating innovation with an innovative curriculum: A curriculum design for a course on new product development," *Int. J. Manag. Educ.*, vol. 19, no. 3, p. 100561, Nov. 2021, doi: 10.1016/J.IJME.2021.100561.
- [11] M. Blankesteyn, B. Bossink, and P. van der Sijde, "Science-based entrepreneurship education as a means for university-industry technology transfer," *Int. Entrep. Manag. J.*, vol. 17, no. 2, pp. 779–808, Jun. 2021, doi: 10.1007/s11365-019-00623-3.
- [12] A. Praditya, I. B. Pamungkas, and N. Rodiyana, "TINJAUAN LITERATUR: Pendidikan Entrepreneur Mahasiswa," *Sci. J. Reflect. Econ. Accounting, Manag. Bus.*, vol. 7, no. 4, pp. 993–1007, Oct. 2024, doi: 10.37481/sjr.v7i4.949.
- [13] B. Afwan, I. Vahlia, and S. Sholiha, "Analisis Kebutuhan Pembelajaran Kewirausahaan di Era Abad 21," in *PROSIDING SEMINAR NASIONAL PENELITIAN DAN PENGABDIAN KEPADA MASYARAKAT (SNPPM) UNIVERSITAS MUHAMMADIYAH METRO*, 2022, pp. 24–33.
- [14] D. Hasmidyani, D. E. Amrina, M. A. Budiman, F. Putriya, and F. A. Nuraidah, "Target and Learning Needs Analysis: The First Step in Developing an IBMEE-Based Entrepreneurship Module," *Int. J. Multicult. Multireligious Underst.*, vol. 10, no. 12, p. 69, Dec. 2023, doi: 10.18415/ijmmu.v10i12.5195.
- [15] R. Wanci, S. Sujariati, M. Maulina, and M. Abdullah, "Need Analysis for the Development of Teaching Materials Using Task-Based Instruction for Nursing Students," *J. Innov. Educ. Cult. Res.*, vol. 5, no. 3, pp. 390–397, Jul. 2024, doi: 10.46843/jiecr.v5i3.1541.
- [16] A. Ruppar, J. Kurth, S. Bubash, and E. Lockman Turner, "A Framework for Preparing to Teach Students With Extensive Support Needs in the 21st Century," *Teach. Educ. Spec. Educ. J. Teach. Educ. Div. Counc. Except. Child.*, vol. 46, no. 1, pp. 26–43, Feb. 2023, doi: 10.1177/08884064211059853.
- [17] A. Susanti and N. F. Ariffiando, "PENGEMBANGAN BAHAN AJAR PENDIDIKAN NILAI DAN MORAL BERBASIS CASE METHOD UNTUK MENGEMBANGKAN CIVIC INTELLIGENCE MAHASISWA PGSD UNIVERSITAS BENGKULU," *Pendas J. Ilm. Pendidik. Dasar*, vol. 9, no. 04, pp. 121–140, 2024, doi: 10.23969/jp.v9i04.20114.
- [18] N. A. Nurlaila Eka Erfiana and L. Rohmah, "Development of Digital Teaching Materials Through Canva and Book Creator for College Students of Elementary Education," *J. Integr. Elem.*

- Educ.*, vol. 5, no. 1, pp. 60–87, 2025, doi: 10.21580/jieed.v5i1.24060.
- [19] G. Z. Sujana, S. V. Susilo, and D. S. Saputra, "The Effectiveness of Interactive E-Book Teaching Materials Development to Improve Students' Reading Comprehension Skills," *EDUHUMANIORA J. Pendidik. Dasar*, vol. 17, no. 2, pp. 211–228, 2025, [Online]. Available: <https://ejournal.upi.edu/index.php/eduhumaniora/article/view/75267>
  - [20] W. Darmawan, "Analisis Kebutuhan dalam Pengembangan Modul Elektronik Berbasis STEM Materi Pelestarian Lingkungan," *J. Pendidik. Biol. Undiksha*, vol. 11, no. 1, pp. 44–52, 2024, doi: 10.23887/jjpb.v11i1.72673.
  - [21] A. Kosimov, "The importance of needs analysis in teaching and enhancing english language proficiency among uzbek efl learners," *Asian J. Res. Soc. Sci. Humanit.*, vol. 11, pp. 616–623, Nov. 2021, doi: 10.5958/2249-7315.2021.00294.X.
  - [22] R. L. Harrison, T. M. Reilly, and J. W. Creswell, "Methodological Rigor in Mixed Methods: An Application in Management Studies," *J. Mix. Methods Res.*, vol. 14, no. 4, pp. 473–495, Oct. 2020, doi: 10.1177/1558689819900585.
  - [23] M. S. Charli, S. K. Eshete, and K. L. Debela, "Learning How Research Design Methods Work: A Review of Creswell's Research Design: Qualitative, Quantitative and Mixed Methods Approaches," *Qual. Rep.*, vol. 27, no. 12, pp. 2956–2960, Jan. 2022, doi: 10.46743/2160-3715/2022.5901.
  - [24] W. Yuliani and E. Supriatna, *Metode penelitian bagi pemula*. Penerbit Widina, 2023.
  - [25] T. D. Nguyen, M.-H. Shih, D. Srivastava, S. Tirthapura, and B. Xu, "Stratified random sampling from streaming and stored data," *Distrib. Parallel Databases*, vol. 39, no. 3, pp. 665–710, Sep. 2021, doi: 10.1007/s10619-020-07315-w.
  - [26] S. J. Stratton, "Population Research: Convenience Sampling Strategies," *Prehosp. Disaster Med.*, vol. 36, no. 4, pp. 373–374, Aug. 2021, doi: 10.1017/S1049023X21000649.
  - [27] L. Lufthansa, Y. D. Saputro, L. N. Rohmah, H. Yusuf, and A. Artanty, "ANALISIS KEBUTUHAN PENGEMBANGAN BAHAN AJAR ELEKTRONIK MATA KULIAH PENJAS ADAPTIF DI IKIP BUDI UTOMO," *J. Sport Sci. Fit.*, vol. 8, no. 1, pp. 23–32, Aug. 2022, doi: 10.15294/jssf.v8i1.58141.
  - [28] B. Tanujaya, R. C. I. Prahmana, and J. Mumu, "Likert Scale in Social Sciences Research: Problems and Difficulties," *FWU J. Soc. Sci.*, vol. 16, no. 4, pp. 89–101, Dec. 2022, doi: 10.51709/19951272/Winter2022/7.
  - [29] A. Purwanto and E. Risdianto, "ANALISIS KEBUTUHAN PENGEMBANGAN BAHAN AJAR DIGITAL MATAKULIAH GEOFISIKA BERBASIS PLATFORM LMS MOODLE UNTUK MENUNJANG IMPLEMENTASI KURIKULUM MBKM," *J. Kumparan Fis.*, vol. 5, no. 1, pp. 7–14, Apr. 2022, doi: 10.33369/jkf.5.1.7-14.
  - [30] S. Ridha, E. Putri, P. A. Kamil, S. Utaya, S. Bachri, and B. Handoyo, "The importance of designing GIS learning material based on spatial thinking," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 485, no. 1, p. 012027, May 2020, doi: 10.1088/1755-1315/485/1/012027.
  - [31] M. N. Widarto, D. Soelistijo, and N. Insani, "Pengembangan media pembelajaran komik digital Geografi pada materi persebaran flora dan fauna di Indonesia," *J. Integr. dan Harmon. Inov. Ilmu-Ilmu Sos.*, vol. 2, no. 12, pp. 1214–1223, Jan. 2023, doi: 10.17977/um063v2i12p1214-1223.
  - [32] J. M. Sanchez, "The Need to Reinforce the Teaching of Basic Descriptive Statistics Required in Reporting Quantitative Laboratory Results: Diagnose of Common Students' Misconceptions," *J. Chem. Educ.*, vol. 100, no. 7, pp. 2713–2718, Jul. 2023, doi: 10.1021/acs.jchemed.3c00394.
  - [33] D. G. H. Divayana, A. Adiarta, and P. W. A. Suyasa, "Development of material contents and online assessment based on the SEVIMA EdLink platform for online learning of program evaluation subject during Covid-19 pandemic in Indonesia," *J. Technol. Sci. Educ.*, vol. 11, no. 2, p. 498, Sep. 2021, doi: 10.3926/jotse.1243.
  - [34] E. Risdianto and J. Fitria, "TPACK-Based Learning Management Training for Batch 2 Pekerti University of Bengkulu," *Aktual J. Pengabd. Kpd. Masy.*, vol. 1, no. 1, pp. 17–22, May 2023, doi: 10.58723/aktual.v1i1.19.
  - [35] T. Ioshimoto, D. I. Shitara, G. F. do Prado, R. Pizzoni, R. H. Sassi, and A. F. T. de Gois, "Education is an important factor in end-of-life care: results from a survey of Brazilian physicians' attitudes and knowledge in end-of-life medicine," *BMC Med. Educ.*, vol. 20, no. 1, p. 339, Dec. 2020, doi: 10.1186/s12909-020-02253-8.
  - [36] A. Kakouris and P. Liargovas, "On the About/For/Through Framework of Entrepreneurship Education: A Critical Analysis," *Entrep. Educ. Pedagog.*, vol. 4, no. 3, pp. 396–421, Jul. 2021, doi: 10.1177/2515127420916740.
  - [37] E. Samwel Mwasalwiba, "Entrepreneurship education: a review of its objectives, teaching methods, and impact indicators," *Educ. + Train.*, vol. 52, no. 1, pp. 20–47, Feb. 2020, doi: 10.1108/00400911011017663.
  - [38] L. Pittaway, "Entrepreneurship Education in Higher Education: A Review of the US Context," *SSRN Electron. J.*, vol. 17, p. 302, 2021, doi: 10.2139/ssrn.3942514.
  - [39] M. L. Rodero-Cosano, A. de los Ríos-Berjillos, S. Millán-Lara, and Y. Muñoz-Ocaña, "Application of Spatial Analysis to Identify the Location of Entrepreneurs Supported by the Regional Government in Andalusia (Spain)," *Appl. Spat. Anal. Policy*, vol. 15, no. 3, pp. 687–712, Sep. 2022, doi: 10.1007/s12061-021-09418-y.
  - [40] G. Secundo, P. Rippa, and R. Cerchione, "Digital Academic Entrepreneurship: A structured literature review and avenue for a research agenda," *Technol. Forecast. Soc. Change*, vol. 157,

- no. May, p. 120118, Aug. 2020, doi: 10.1016/j.techfore.2020.120118.
- [41] W. Nowiński, M. Y. Haddoud, D. Lančarič, D. Egerová, and C. Czeglédi, "The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries," *Stud. High. Educ.*, vol. 44, no. 2, pp. 361–379, Feb. 2022, doi: 10.1080/03075079.2017.1365359.
- [42] J. Zhang, Z. Wang, C. O. Antwi, X. Liang, and J. Ge, "Geospatial Thinking and Sense of Place: The Mediating Role of Creativity," *Sustainability*, vol. 15, no. 1, p. 523, Dec. 2022, doi: 10.3390/su15010523.
- [43] T. J. Bae, S. Qian, C. Miao, and J. O. Fiet, "The Relationship between Entrepreneurship Education and Entrepreneurial Intentions: A Meta-Analytic Review," *Entrep. Theory Pract.*, vol. 38, no. 2, pp. 217–254, Mar. 2020, doi: 10.1111/etap.12095.
- [44] A. R. Garcia, S. B. Filipe, C. Fernandes, C. Estevão, and G. Ramos, "Entrepreneurship in Education," Oct. 2015. doi: 10.1787/ccac96a-en.
- [45] C. Lukita, M. Hardini, S. Pranata, D. Julianingsih, and N. P. L. Santoso, "Transformation of Entrepreneurship and Digital Technology Students in the Era of Revolution 4.0," *Aptisi Trans. Technopreneursh.*, vol. 5, no. 3, pp. 291–304, Nov. 2023, doi: 10.34306/att.v5i3.356.
- [46] R. Kadian, "Effectiveness Of Blended Learning in Higher Education: A Systematic Review at Global Level," *Am. J. Psychiatr. Rehabil.*, vol. 28, no. 2, pp. 61–67, Feb. 2025, doi: 10.69980/ajpr.v28i2.347.
- [47] V. Alvadina, Pani Yuni Fitriisa, Azmi Yufriadi, Ferdi Syahrani, Fadilla Ngardi, "Integrating Entrepreneurship Education into the Islamic Madrasah Curriculum: A Qualitative Case Study of Experiential and Project-Based Learning under Indonesia's 'Merdeka Belajar' Initiative," *J. Pendidik. Islam*, vol. 13, no. 2, p. . 131–150, 2024, doi: 10.14421/jpi.2024.132.131-150.
- [48] S. Z. Novrita, N. Jalinus, Ridwan, R. Abdullah, W. Nelmira, and Adriani, "Effectiveness of Project-Based Learning in Textile Dyeing Course to Improve Work Readiness as Entrepreneurs in the Digital Era," *J. Penelit. Pendidik. IPA*, vol. 11, no. 7, pp. 484–492, Jul. 2025, doi: 10.29303/jppipa.v11i7.11616.
- [49] N. Bosma, J. Hessels, V. Schutjens, M. Van Praag, and I. Verheul, "Entrepreneurship and role models," *J. Econ. Psychol.*, vol. 33, no. 2, pp. 410–424, Apr. 2020, doi: 10.1016/j.joe.2011.03.004.
- [50] Ryan Gabriel Siringoringo and Muhamad Yanuar Alfaridzi, "Pengaruh Integrasi Teknologi Pembelajaran terhadap Efektivitas dan Transformasi Paradigma Pendidikan Era Digital," *J. Yudistira Publ. Ris. Ilmu Pendidik. dan Bhs.*, vol. 2, no. 3, pp. 66–76, May 2024, doi: 10.61132/yudistira.v2i3.854.
- [51] V. F. Motta and S. V. R. Galina, "Experiential learning in entrepreneurship education: A systematic literature review," *Teach. Teach. Educ.*, vol. 121, p. 103919, Jan. 2023, doi: 10.1016/J.TATE.2022.103919.
- [52] M. G. Nugraha, G. Kidman, and H. Tan, "Interdisciplinary STEM education foundational concepts: Implementation for knowledge creation," *Eurasia J. Math. Sci. Technol. Educ.*, vol. 20, no. 10, p. em2523, Oct. 2024, doi: 10.29333/ejmste/15471.
- [53] M. Farrokhnia, Y. Baggen, H. Biemans, and O. Noroozi, "Bridging the fields of entrepreneurship and education: The role of philosophical perspectives in fostering opportunity identification," *Int. J. Manag. Educ.*, vol. 20, no. 2, p. 100632, Jul. 2022, doi: 10.1016/J.IJME.2022.100632.
- [54] Z. Yang, "Human capital space: a spatial perspective of the dynamics of people and economic relationships," *Humanit. Soc. Sci. Commun.*, vol. 10, no. 1, p. 145, Apr. 2023, doi: 10.1057/s41599-023-01639-5.
- [55] R. T. P. B. Santoso, S. H. Priyanto, I. W. R. Junaedi, D. S. S. Santoso, and L. T. Sunaryanto, "Project-based entrepreneurial learning (PBEL): a blended model for startup creations at higher education institutions," *J. Innov. Entrep.*, vol. 12, no. 1, p. 18, Mar. 2023, doi: 10.1186/s13731-023-00276-1.
- [56] J. M. Lopes, S. Gomes, and E. Nogueira, "Educational insights into digital entrepreneurship: the influence of personality and innovation attitudes," *J. Innov. Entrep.*, vol. 14, no. 1, p. 16, Feb. 2025, doi: 10.1186/s13731-025-00475-y.
- [57] E. Dias-Oliveira, R. Pasion, R. Vieira da Cunha, and S. Lima Coelho, "The development of critical thinking, team working, and communication skills in a business school—A project-based learning approach," *Think. Ski. Creat.*, vol. 54, p. 101680, Dec. 2024, doi: 10.1016/J.TSC.2024.101680.