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An Empirical Study on Strengthening Student Food Security through the Development of an Ethnofood-Based Curriculum using a needs Assessment Approach

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ABSTRACT

Recent years have seen food insecurity among college students emerge as a public health concern affecting diet quality, mental health, academic achievement, and graduation rates. This study highlights the importance of developing an ethnofood-based curriculum to improve student food security. It used a mixed-methods approach with a convergent design. Participants and data sources included qualitative, quantitative, and secondary data. Qualitative data were gathered through in-depth interviews with curriculum and food experts using purposive sampling. Quantitative data came from 150 Universitas Pendidikan Indonesia (UPI) students via a needs analysis questionnaire. Secondary data included policy documents, official reports, and scientific literature related to food security. The results reveal that although students are very interested in ethnofood, they have limited knowledge of its nutritional benefits and lack practical skills in preparation and preservation. Lecturers and curriculum developers stress the need for flexible, competency-based programs aligned with national microcredentials and sustainable education policies. The study concludes that an ethnofood-based curriculum can enhance students' knowledge, attitudes, and skills in using local food resources, thereby promoting food security at both individual and community levels.

Keywords: Curriculum, Ethnofood, Food Security, Need Assessment, University Students.

INTRODUCTION

Most research on food insecurity among college students has raised concerns about the high prevalence of food insecurity among students, reaching critical levels (Ahmad et al., 2022). Reported rates of food insecurity among college students are significantly higher than those of the general population (Whatnall et al., 2020). University students worldwide are at a higher risk of food insecurity than the general population, ranging from 35% to 42% (Kent et al., 2022). One contributing factor is lifestyle. Lifestyle changes in the era of globalization affect all age groups, but young people, including college students, are relatively more affected by globalization (Sayekti et al., 2022). Most college students are in the young adult age range (18 to 24 years), a critical period for developing eating behaviors (Jauziyah et al., 2021).

Food is a fundamental human need. Every person has the right to access food as a basic human right, as stated in Article 27 of the 1945 Constitution and the Rome Declaration (1996). This also supports the regulation of Law Number 7 of 1996 concerning Food, which describes it as a crucial necessity for a nation's survival, especially

regarding individual needs. Despite national laws aimed at promoting food security, food security in Indonesia remains a challenge, particularly among university students. Issues related to food, water, and energy crises have the potential to cause additional conflicts (Muawanah & Laila, 2024). Students face the risk of experiencing food insecurity, meaning they lack consistent access to affordable, nutritious, and sufficient food (Tono & Fauzia, 2018).

Students often eat unhealthy foods irregularly, snack more, and frequently skip breakfast and lunch (Mustofa & Syafi'ah, 2018). Irregular eating patterns can affect stomach function (Kefi et al., 2022). An inconsistent diet can make it hard for the stomach to adjust. If this continues, excess stomach acid can irritate the gastric mucosa and cause gastritis (Angelica & Siagian, 2022). Most college students have unhealthy eating habits, such as skipping breakfast and eating fast food (Yurisqa et al., 2024). Among adolescents, fast food, soft drinks, and sugar are more popular than vegetables and fruit to meet nutritional needs (Ratih et al., 2022). Habits like spicy or sour foods, tea, coffee, and carbonated beverages can increase the risk of dyspepsia(Kefi et al., 2022). Reasons students eat processed foods include convenience, wide availability, and appetite (Tono & Fauzia, 2018). Food security is a condition where everyone has consistent physical, social, and economic access to sufficient, safe, diverse, nutritious, equitable, and affordable food in quality and quantity, which aligns with their religion, beliefs, and culture, allowing for good nutritional status and a healthy, active, and productive life (Sukandar et al., 2024). The Food and Agriculture Organization of the United Nations defines food security through four dimensions: food availability, access (both physical and economic), utilization, and stability over time (FAO et al., 2022). Food security remains one of the world's biggest challenges (Akbari et al., 2022). It is also central to discussions on sustainable development (El Bilali et al., 2020). Ensuring good health is a country's main health protection goal (García-Díez et al., 2021). Data shows that 149 million children worldwide suffer from food insecurity, often due to insufficient nutritional intake essential for growth and development, which remains a global issue (Yusriadi & Cahaya, 2022).

The role of education in addressing these issues is crucial. Education is essential for a country's progress (Dewi & Listiaji, 2024). Education and culture are two interconnected elements of daily life, as culture is deeply rooted in society, and education is necessary for every community (Fauzi et al., 2020). Education is the most strategic approach to fostering and implementing sustainable development values (Vilmala et al., 2022). It must empower individuals to observe their environment and engage in critical and systemic thinking to increase sustainability awareness (Sari et al., 2025). Education is a primary driver in achieving the Sustainable Development Goals (SDGs), especially SDG 4, which aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (Anwar et al., 2025).

Education for Sustainable Development (ESD) aims to empower everyone to make informed decisions that maintain environmental integrity, economic viability, and social justice for current and future generations, while honoring all cultural diversity. This effort is implemented across all levels and types of education (UNESCO 2009 & 2014). Cultural diversity, including food, can be effectively organized and documented through education. In line with SDG target number 4, point 7, by 2030, ensure that all students gain the knowledge and skills necessary to promote sustainable development, which includes education for sustainable development and sustainable lifestyles, human rights, gender equality, fostering a culture of peace and non-violence, global citizenship, and an appreciation of cultural diversity and its role in sustainable development. Education facilitates curricula specifically designed to address various food-related issues.

Ethnofood is part of local cultural wealth that has been underutilized, despite its significant potential to contribute to food diversity within a healthy and sustainable diet (Sultanbawa et al., 2023). In an educational context, ethnofood can serve as a relevant and contextual learning resource, as it relates to nutrition, health, and reflects cultural values, traditions, and local wisdom. Preserving ethnofood can be achieved by developing educational curricula that empower individuals to inherit, develop, and transform food-related cultural heritage as part of the growth of future civilizations (Hikmawati et al., 2021). Moreover, students need to cultivate national insight, patriotism, diversity, and tolerance. They should gain a broader understanding of the diversity of cultures, customs, ethnicities, languages, and Indonesia's rich resources (Wulandari et al., 2021). Therefore, creating an ethnofood curriculum is essential. To develop such a curriculum, analyzing the current ethnofood curriculum is necessary to determine the direction and foundation for creating a curriculum that aligns with the actual needs of students and the context of educational institutions. Needs analysis or assessment is a vital part of curriculum development (Widodo, 2017). Hence, this study aims to analyze the need for an ethnofood-based curriculum to enhance student food security.

METHODS

This needs analysis was conducted to identify the ethnofood curriculum needs of students, viewed from both the students' perspective and a professional perspective. This study used a mixed methods approach with a

convergent mixed methods design. In this design, quantitative and qualitative data are collected simultaneously, analyzed separately, and then combined to gain a comprehensive understanding of the research problem (Creswell & Creswell, 2018). The goal was to analyze the need to develop an ethnofood-based curriculum to improve student food security. Semi-structured interviews were conducted using a loosely prepared set of questions suitable for both professional and student groups, and a questionnaire was created to explore the complex topic of students' needs for an ethnofood and food security curriculum.

Participants and data sources included qualitative, quantitative, and secondary data.

1. **Qualitative data** were gathered through in-depth interviews with curriculum and food experts using purposive sampling. Initial semi-structured interviews were carried out with a loosely prepared set of questions (Bayyurt & Karataş, 2015).
2. **Quantitative data** were collected from 150 students of Universitas Pendidikan Indonesia (UPI) using a needs analysis questionnaire.
3. **Secondary data** were obtained from policy documents, official reports, and scientific literature related to food security.

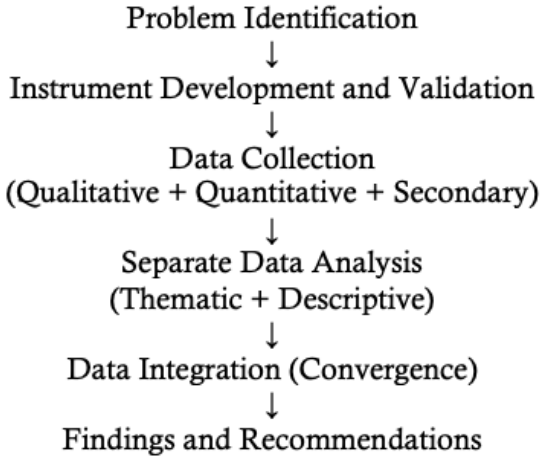

Figure 1. Flowchart of the ethnofood curriculum needs analysis research.

The instruments included a semi-structured interview guide, a needs analysis questionnaire, and an expert validation sheet. The interview guide explored academic needs, student needs, institutional support, social and industrial contexts, and technical aspects of microcredentials. In qualitative research, semi-structured interviews are often preferred because they are believed to produce reliable data through an 'interview guide,' which allows participants the freedom to express their views in their own way (Bayyurt & Karataş, 2015). Researchers can customize their questions to encourage meaningful two-way communication that is enhanced by empathy, rapport, and trust. Interviews with professionals, including the curriculum developer from Universitas Pendidikan Indonesia, a gastronomy expert lecturer at NHI Bandung Tourism Polytechnic, three department heads at Bandung City Food and Agriculture Security Service, the Director of System Technology and Information at Universitas Pendidikan Indonesia, representatives of study program heads at Universitas Pendidikan Indonesia, and student representatives, were conducted in Indonesian. Researchers visited their workplaces, where they felt comfortable exchanging ideas about ethnofood curriculum development needs. The professionals were asked structured questions such as:

1. How are food security policies put into practice in current courses?
2. What are your thoughts on your course textbooks, basic equipment, and technological resources?
3. Do you integrate technology into your teaching?
4. What are the essential materials to convey to students regarding ethnofood and food security?
5. Is ethnofood training important for students?
6. What if it was done online using a microcredential?

In the second phase of the needs analysis, students' perceived needs were identified through a questionnaire designed to highlight the need for an ethnofood curriculum among the statement items. This questionnaire aimed to gather information on several aspects, including the availability and stability of ethnofood, access and affordability, utilization, independent production and management, nutritional value and health benefits, resilience from foreign food sources, and the need for ethnofood training. The questionnaire, written in Indonesian,

consisted of three sections: personal information, a five-point Likert scale, and closed-ended statement items. It was administered to 150 students, starting with collecting personal details such as gender, study program, and faculty. Students then rated 22 items related to the need for an ethnofood curriculum using a scale from 1 (strongly disagree) to 5 (strongly agree).

Before implementing the above instruments in the field, expert judgment was first conducted with three specialists, including an ethnofood expert, a curriculum and higher education expert, and a linguist. After the three experts confirmed that the instrument was suitable for testing, the instrument was then tested. The questionnaire was initially tested on 26 students outside the research sample to assess its validity and reliability. The validity and reliability of the instrument were analyzed using SPSS software. The questionnaire is considered valid if the SPSS output shows that the instrument meets validity criteria—specifically, if the calculated r value (corrected item-total correlation) for each question exceeds the critical r value at a certain significance level, and if all items collectively measure the intended construct. Additionally, the questionnaire is deemed valid if the significance value (sig.) is less than 0.05 ($p < 0.05$), indicating that each question item is valid at the 0.05 significance level. The validity of each statement item is detailed in Table 1.

Table 1. Validity results of the questionnaire

No statement item	Sig. (2-tailed)	Criteria
1	0.008	Valid
2	0.006	Valid
3	< 0.001	Valid
4	0.13	Valid
5	0.13	Valid
6	<0.001	Valid
7	0.056	Invalid
8	0.036	Valid
9	0.005	Valid
10	<0.001	Valid
11	0.972	Invalid
12	0.001	Valid
13	<0.001	Valid
14	<0.001	Valid
15	0.004	Valid
16	0.001	Valid
17	0.226	Invalid
18	0.246	Invalid
19	0.005	Valid
20	<0.001	Valid
21	0.017	Valid
22	0.068	Invalid
23	0.007	Valid
24	0.105	Invalid
25	0.046	Valid
26	0.202	Invalid
27	0.002	Valid
28	0.002	Valid

Based on the SPSS output results, out of the 28 statement items, 7 were deemed invalid, specifically items number 7, 11, 17, 18, 22, 24, and 26. The invalid items were discarded or not used in data collection, except for item number 17. Since there were no statement items representing the measured indicators, item 17 was not removed but corrected. Further testing for the instrument's reliability was also conducted using SPSS software to determine the Cronbach's alpha value. The results showed a reliability of 0.886 for the ethnofood curriculum needs analysis questionnaire, categorized as high. The items deemed valid and reliable were then used to collect needs analysis data from students.

Qualitative data were analyzed thematically to identify key patterns and themes, while quantitative data were examined using descriptive statistics (frequency, percentage, and mean). The results were compared and integrated to combine both data sets. Divergent findings were interpreted critically to gain a comprehensive understanding of the research outcomes.

RESULTS AND DISCUSSION

The data for this ethnofood curriculum analysis research includes questionnaires and interviews. The questionnaires were completed by 150 students from various science and food study programs at Universitas Pendidikan Indonesia (UPI). Figure 2 displays the percentage of student participation in study programs at UPI.

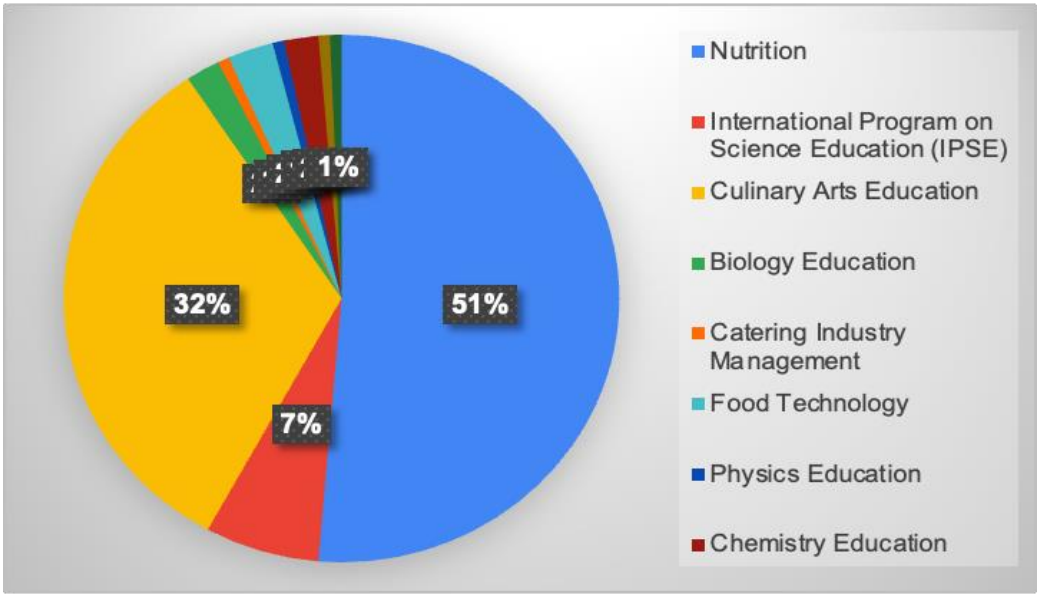

Figure 2. Percentage of involvement of study program students as respondents

The data from the ethnofood curriculum questionnaire show that the students who responded most to the ethnofood curriculum were Nutrition students (51%), followed by Culinary Arts Education students (32%), and the International Program on Science Education (7%). Other study programs responded, but not more than 7%. Most respondents were in the 19–22 age range, and most were female (Figure 3). This composition illustrates that the participating student group is dominated by aspiring professionals in the fields of science and food who have the potential to become agents of change in strengthening food security through sustainable education and practice.

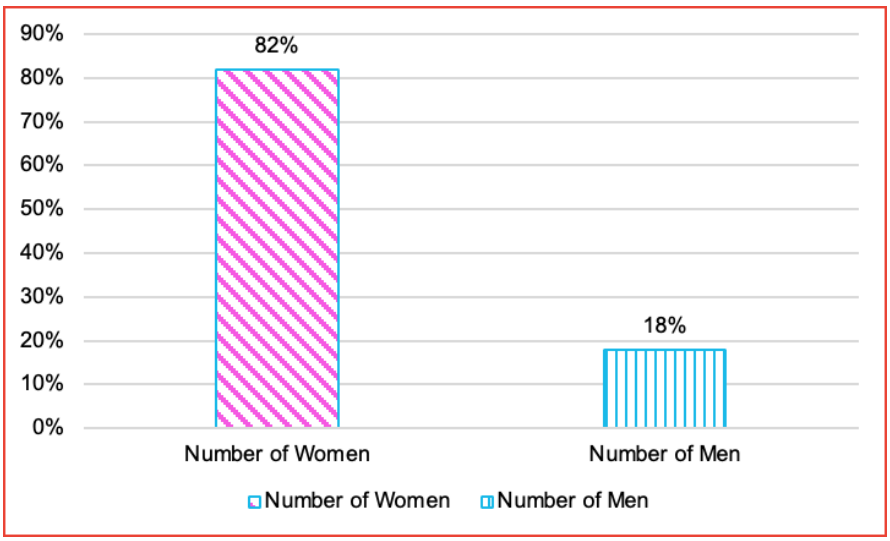

Figure 3. Percentage of respondents' gender

Before distributing the questionnaire to students to assess the need for an ethnofood curriculum to improve food security, a conceptual synthesis of ethnofood and food security was conducted to develop ethnofood indicators relevant to food security. These indicators were used to create each item in the questionnaire. The synthesis identified both conceptual and operational indicators, which were then used to formulate the statements. The results of the descriptive statistical analysis for each indicator are presented in Table 2.

Table 2. Descriptive Statistical Analysis

Indicator	No. Item Statement	Mean	Median	Modus	Standard Deviation
1) Availability and Stability of Ethnofood	1	4	4	4	0.827
	2	4	4	4	0.745
	3	3	3	3	1.115
	4	4	4	4	0.97
2) Access and Affordability of Ethnofood	5	4	4	4	0.89
	6	4	4	4	1.042
	7	4	4	4	0.994
3) Utilization of Ethnofood	8	4	4	4	1.094
	9	4	4	5	1.185
	10	4	3	3	1.044
4) Independent Ethnofood Production and Management	11	4	4	4	0.78
	12	4	4	5	1.209
	13	3	3	3	0.972
	14	3	3	4	1.217
5) Nutritional Value and Health of Ethnofood	15	4	4	4	0.993
	16	4	5	5	0.783
	17	4	4	4	0.839
6) Resilience from Foreign Food	18	4	3	3	0.842
	19	2	2	2	1.1
7) Ethnofood Training Needs	20	4	4	5	0.823
	21	4	4	5	0.813
	22	4	4	5	0.756

The scale used to evaluate the ethnofood curriculum needs analysis questionnaire for improving food security consists of five points on a Likert scale: 1 = Strongly Disagree (STS); 2 = Disagree (TS); 3 = Undecided (RG); 4 = Agree (S); 5 = Strongly agree (SS). According to Table 1, it is evident that among statement items 1 to 22, three items have an average response of 3, indicating undecided, and one item has an average response of 2, indicating disagreement. The remaining items have an average of 4, indicating agreement. The statement items that reflect hesitation or disagreement are (3) I am used to storing traditional food so that it can be consumed for several days without having to cook every day; (13) I am used to using traditional methods to store food so that it can be consumed in the next few days; (14) I know and have tried storing traditional food by drying, fermenting, or salting; and (19) I have participated in discussions, workshops, or seminars discussing the importance of traditional food. Based on the standard deviation, each indicator exhibits a smaller standard deviation compared to its mean value. This suggests that the data points are more homogeneous and clustered around the average, indicating low variability and a more reliable mean.

Interviews with the Bandung City Department of Food Security and Agriculture (DKPP) indicate that local food availability is a primary focus through the Buruan Sae and Tali Paranti programs. These programs emphasize the use of home gardens, integrated farming, and the preservation of local cultural values. This effort highlights the importance of including material on food self-sufficiency, local food diversification, and strengthening cultural identity within the ethnofood curriculum, ensuring students understand the origins of local food traditions as a foundation for sustainable food security. Regarding distribution and consumption, the One Day No Rice and B2SA programs are seen as effective food diversification campaigns, although interest among young people in local food remains low due to a lack of contextual education. This underscores the need for an ethnofood curriculum that not only introduces local food varieties but also promotes economic, social, and health values. On food safety, the DKPP emphasizes the importance of increasing awareness and engaging young people in food safety training and certification. Therefore, developing an ethnofood curriculum should address food availability, consumption, and safety in a comprehensive way.

Interviews with traditional culinary entrepreneurs at Cihapit Market reveal that traditional foods remain popular, but they face difficulties in preserving authentic flavors and sourcing quality ingredients. Business owners

highlight the importance of innovation to keep traditional culinary arts relevant to today's preferences without losing local values. They also mention that recipes and skills are passed down through generations, but interest among younger people in continuing traditional businesses is waning. This highlights the need for an ethnofood curriculum that combines culinary heritage preservation, practical skills, and product innovation strategies. Higher education can support practice-based learning, local entrepreneurship, and modern marketing rooted in local wisdom.

Interviews with representatives from the professional organization developing the curriculum (HIPKIN) revealed that microcredential programs in Indonesia have evolved through various digital efforts and the Independent Campus policy, but still face challenges related to standardization and integration. Ethnofood is seen as relevant for development as a microcredential because it reflects cultural, economic, and sustainability values, and could help improve food security by promoting diversification and preservation of traditional culinary arts. Its implementation requires collaboration between academia, industry, communities, and the government, supported by quality assurance, competency standards, and sustainable financing models such as CSR and MSME partnerships.

Interviews with international academics in the fields of gastronomy and traditional cuisine revealed that ethnofood serves not only as a scientific discipline but also as a way to preserve and empower local food traditions. Students need to develop three core skills—knowledge, skills, and attitudes—through experiential learning such as field observation, culinary practice, and community involvement. Values like hygiene, cultural ethics, and spirituality are considered essential for shaping students' character and achieving food security. The main challenge is the declining interest of the younger generation in traditional cuisine and the need for cross-sector policy support.

An interview with the Head of the Curriculum Development Division at University X revealed that the institution already has a foundation for implementing a microcredential program, but its rollout is still limited by the availability of modules and funding. The ethnofood microcredential program is seen to have great potential because it aligns with the university's policy direction, which is flexible and responsive to community needs. Developing an integrated training module that combines theoretical and practical aspects, involving collaboration among different fields and local food practitioners, is necessary to ensure the program's sustainability and relevance.

Meanwhile, the Head of the Catering Industry Management Study Program emphasized that developing an ethnofood curriculum is essential for increasing student awareness of local values and national food security. In the context of microcredential-based online training, knowledge areas such as basic ethnofood concepts, local food varieties, nutritional value, and cultural philosophy can be effectively taught. However, skills and attitudes require hands-on experience, so they need to be combined with offline practical activities. Online training can serve as a foundation for building conceptual understanding, which can then be applied through real-world experiences.

Research findings suggest that ethnofoods have strong potential for integration into higher education, especially for enhancing student food security. Food security is essential for adolescents' growth and well-being, and their perspectives are vital for shaping their dietary habits and overall biological, social, and cultural development—factors that influence their future health, well-being, and success (Alehegn et al., 2025). The World Health Organization (WHO) has identified diet as one of four key modifiable risk factors in the development of chronic diseases (Stanley et al., 2025). Low food security among university students is gaining more attention as post-pandemic economic pressures increase, affecting a large portion of society (McKay et al., 2025). Additionally, recent concerns about food insecurity among university students have become recognized as an emerging issue within the university community (Otekunrin & Otekunrin, 2025). College students are especially vulnerable, with food insecurity rates significantly exceeding those of the general population (Leung et al., 2025). Food security among college students is an increasing concern, with potential impacts on their health, academic performance, and future well-being (Ascencio-López et al., 2025).

Based on interviews with curriculum and food security experts, ethnofood is understood not only as traditional food but also as a knowledge system that combines cultural, ecological, and health aspects. Therefore, the urgency of preserving this knowledge is clear and requires careful integration into the sustainable food and health framework (Hassan et al., 2024). The connection between food, culture, and the environment plays a vital role in shaping community identity and maintaining traditional knowledge (Bharti et al., 2025). Students need to understand the links between local food culture, nutritional value, and sustainable practices in a learning environment relevant to everyday life. The rich interconnectedness of biodiversity and culture must be protected and utilized for future generations; one way to do this is through environmental education that uses local cultural learning resources (Fahrudin et al., 2023). Therefore, an ethnofood-based curriculum not only introduces traditional foods but also fosters scientific, cultural, and ecological values as a foundation for developing sustainable food awareness (Hikmawati et al., 2021).

A needs analysis revealed a gap between students' theoretical understanding of local food and their application of that knowledge in real-world contexts. Although most students are familiar with traditional foods, their

understanding is still limited to conceptual aspects and lacks the ability to relate these to issues of food security or local food sustainability. Education on nutrition and resource management is needed to reduce food insecurity (Sjaifuddin et al., 2019). This situation reinforces the need for curriculum development to improve food security, especially for university students. It is important for the developed curriculum to be dynamic and responsive, cater to student diversity, expand learning facilities, and foster assessment within learning (Pujiastuti & Haryadi, 2020).

Interviews with experts suggest that the microcredential approach is highly relevant to national policies, especially the Independent Learning-Independent Campus (MBKM) program. Launched in 2020, the MBKM policy aims to provide a more contextual and practical learning experience in real-world settings (Sensony et al., 2024). Students are expected to gain additional skills beyond their study programs to prepare them for the dynamic and constantly changing industrial environment (Wahyuningtyas et al., 2022). This curriculum also aligns with the direction of higher education development, which emphasizes experiential learning. Flexible approaches are designed to help students develop their potential based on their interests and talents (Ulum et al., 2023). Based on a synthesis of ethnofood concepts from Syamsuri et al. (2023); Syamsuri & Alang (2021); Sultanbawa et al. (2023); Almansouri et al. (2021); Rocillo-Aquino et al. (2021); Wibisono et al. (2020); Sudarmin et al. (2024) and food security from FAO et al. (2022); Anderson (2018); (Sukandar et al. (2024), seven main indicators relevant to students were identified: 1) Availability and stability of ethnofood, 2) Access and affordability, 3) Utilization of traditional food, 4) Independent production and management, 5) Nutritional and health benefits, 6) Independence from foreign food sources, and 7) Need for ethnofood training. This synthesis also highlighted the concept of ethnofood as all types of food ingredients or processed foods consumed by specific ethnic groups as part of their cultural traditions, which have been scientifically tested for their nutritional value, safety, and health benefits.

In the context of this research, ethnofood is defined as traditional food produced, processed, and consumed using local knowledge passed down through generations; it contains bioactive components or nutrients that are proven to benefit health through scientific studies; and it is connected to the aspects of local food production, processing, distribution, and consumption that support student food security. Other names include heritage food, ancestral cuisine, archipelago flavor, food heritage, wisdom of taste, legendary culinary, and taste traditions ((Syamsuri et al., 2023); (Syamsuri & Alang, 2021); (Sultanbawa et al., 2023); (Almansouri et al., 2021); (Rocillo-Aquino et al., 2021); (Wibisono et al., 2020); (Sudarmin et al., 2024)). Meanwhile, food security is defined as the condition where students' food needs are met in terms of quantity, quality, and adequate access to support their academic activities and health. In this research context, food security is operationalized as: food availability, which includes students' ability to access and maintain food stocks at home; food affordability, which includes students' financial capacity to purchase nutritious food; food utilization, which involves students' eating habits, cooking skills, and nutritional knowledge; and food stability, which involves the ability to sustain a healthy diet despite crises or limited supply ((FAO et al., 2022); (Anderson, 2018); Sukandar et al., 2024)).

The questionnaire results indicate that students have a high level of awareness of the importance of consuming local food, but this has not been followed by optimal management and utilization skills. These results align with the findings of (Rahayu et al., 2023), who stated that students' understanding of traditional food safety and processing is still theoretical and not yet integrated into learning practices. Therefore, these indicators can be used as a basis for formulating learning outcomes and developing ethnofood microcredential modules to strengthen student food security, both individually and as a community. Microcredentials offer a flexible and modular structure, enabling higher education institutions to design programs that can be quickly updated and integrated into existing curricula (Varadarajan et al., 2023). Effective microcredential design requires clear learning outcomes, authentic assessments, and alignment with institutional and professional standards(Reed et al., 2024).

Interviews also revealed that internally, the Indonesian University of Education (UPI) has significant potential to lead the development of an ethnofood microcredential curriculum. This is supported by the presence of an ethnoscience study center, a culinary and nutrition laboratory, and UPI's vision, which focuses on strengthening character and culture in education. However, challenges include coordination between units, the need for supportive policies, and the integration of a nationally recognized certification system. Furthermore, experts highlighted the importance of forming partnerships with local governments and local food micro, small, and medium enterprises (MSMEs) to give students practical experience in the production and distribution of traditional foods. This aligns with the quadruple helix approach to higher education development, where collaboration between campuses, industry, government, and the community is key to creating socially and economically relevant innovations (Etzkowitz & Leydesdorff, 2000). Integrating ethnofood into the curriculum also has implications for enhancing students' scientific literacy. Scientific concepts such as fermentation, oxidation, enzymatics, and microbiological food safety can be taught within the context of local culture. This makes learning more relevant and meaningful, as highlighted by the contextual science learning approach (Rapsanjani et al., 2025).

Furthermore, ethnofood supports the achievement of the Sustainable Development Goals (SDGs), especially goals 2 (Zero Hunger) and 4 (Quality Education). By using local food ingredients, students can help promote sustainable development and community-based food security, in line with the principles of Education for

Sustainable Development (UNESCO, 2014). Nutrition is essential for human health at both the individual and community levels, and it is closely connected to the social, economic, and environmental aspects of sustainable development (Onyeaka et al., 2024). Overall, the findings of this study suggest that developing a microcredential-based ethnofood curriculum is an innovative way to strengthen student food security. This curriculum combines knowledge, skills, and attitudes, grounded in scientific values, science, and local wisdom. Through practical learning, students are expected to become not only knowledgeable consumers but also competitive local food producers and innovators. Therefore, the ethnofood microcredential program can serve as a model for higher education that adapts to current needs, promotes sustainability, and reinforces national identity through food and culture.

CONCLUSION

This study concludes that creating an ethnofood-based curriculum is vital for strengthening students' food security by improving their knowledge, skills, and attitudes toward local foods. The needs analysis indicates that the key elements to include are the availability and stability of ethnofood, access and affordability, utilization of traditional foods, autonomous management, nutritional and health benefits, independence from foreign foods, and the need for ethnofood training. Experts emphasize that ethnofood education develops practical skills in processing and using local foods and supportincorporates cultural, ecological, and scientific values as part of scientific literacy and national identity. With institutional backing and collaboration among various stakeholders, the ethnofood microcredential curriculum can serve as a strategic innovation aligned with the vision of the Independent Campus and Education for Sustainable Development, aiming to cultivate a generation of self-reliant students with strong character who are competitive on a global scale.

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