

Evaluation of Local Food Processing Training Design Based on ADDIE and FAO Food Security Pillars in Central Java

**Agus Subhan Prasetyo^{12*}, Kim E. Dooley¹, Gary Briers¹, Darlene H. Locke¹,
Michael E. Shehane¹**

¹Texas A&M University, 400 Bizzell St, College Station, TX, United States

²Universitas Diponegoro, Jl Prof. Soedarto, Tembalang, Semarang, Indonesia

*Correspondence Email: setyo.subhan@live.undip.ac.id

Submitted 30 March 2026; Approved 18 June 2026

ABSTRACT

Food security is a strategic issue in Indonesia; however, evaluations of training programs supporting food security rarely systematically assess program design quality. This study analyzes the design of the Local Food Diversification Processing Training Program and evaluates its alignment with the Analysis and Design phases of the ADDIE model and the FAO's Four Pillars of Food Security. A qualitative approach was employed, using content analysis of program reports and training materials prepared in 2024 by the Central Java Provincial Food Security Agency and its technical partners. The results indicate that the program design considered local food potential, participant characteristics, and objectives related to food processing skills and entrepreneurship development. Conceptually, the program design aligns with the FAO's Four Pillars of Food Security. However, the needs analysis lacked standardized instruments, and learning outcome indicators had not been formulated in operational terms. These findings suggest that while the program has a strong substantive foundation, strengthening the Analysis and Design phases is necessary to enable more systematic measurement of its contribution to food security. The study confirms that the ADDIE model and the FAO's Four Pillars can serve as an evaluation framework for assessing the design quality of food security-oriented training programs.

Keywords: *ADDIE model, content analysis, diversification of local food, FAO, food security, training program*

BACKGROUND

Food diversification based on local potential is an important strategy for strengthening national food security. In Indonesia, this strategy is not only intended to reduce dependence on specific food commodities but also to increase the added value of local resources through the development of food processing enterprises. In this context, local food processing training programs serve as one of the instruments widely utilized by local governments to enhance community capacity in processing, marketing, and developing food products based on local resources. The success of such programs is determined not only by the availability of raw materials or policy support but also by the quality of the training design that underpins their implementation. Well-designed training programs

influence the relevance of instructional content, learning strategies, and the achievement of program objectives aligned with participants' needs and broader food policy goals (Cotter et al., 2023).

Within the food security literature, the Four Pillars of Food Security framework developed by the Food and Agriculture Organization (FAO) emphasizes that food security extends beyond food availability to include access, utilization, and stability (FAO, 2008). These four dimensions position community capacity development as a critical component in strengthening sustainable food systems. Consequently, local food processing training programs are not merely intended to improve participants' technical skills but also have the potential to serve as development instruments that support the strengthening of regional food systems.

From the perspective of instructional design, the ADDIE model is widely recognized as a systematic framework for designing learning programs. The model consists of five interconnected phases: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009). Among these phases, Analysis and Design are often regarded as the foundation because they determine how participant needs are identified, learning objectives are formulated, instructional strategies are developed, and success indicators are established (Molenda, 2015). In other words, the effectiveness of subsequent implementation phases is strongly influenced by the quality of processes undertaken during these initial stages.

However, the application of the ADDIE model in Indonesia remains largely associated with research and development (R&D) studies aimed at producing educational products such as modules, instructional media, and curricula. Its use as a framework for evaluating the quality of training program design remains relatively limited. At the same time, evaluations of public-sector training programs tend to focus on implementation processes, participant satisfaction, or post-program outcomes. As a result, the quality of the instructional design that guides program implementation is often overlooked and rarely examined systematically. This situation creates a gap between instructional design principles, which emphasize systematic planning based on identified needs, and evaluation practices that are primarily oriented toward end results.

The gap becomes particularly important in the context of food security-oriented training programs. A training program may be considered successful because it achieves participation targets or receives positive evaluations from participants, while the quality of the instructional design that underlies its implementation remains largely unexamined. Consequently, program effectiveness should not be assessed solely through implementation outcomes but also through the quality of the design that shapes learning experiences and guides program delivery. This perspective is consistent with the view that instructional design constitutes a critical component of program quality and therefore warrants evaluation as a subject of inquiry in its own right (Branch, 2009; Molenda, 2015).

Despite the widespread use of ADDIE in educational and training settings, limited research has examined the Analysis and Design phases as standalone objects of evaluation, particularly within public-sector training programs aimed at strengthening food security. Existing studies have predominantly focused on the effectiveness of implementation, participant satisfaction, or program impacts, while relatively little attention has been given to the quality of the instructional design that precedes those outcomes. Moreover, studies that connect instructional design evaluation with broader food security objectives remain scarce. As a result, there is limited understanding of how the quality

of training design may influence the potential contribution of training programs to food system development.

This study addresses these gaps by positioning the Analysis and Design phases of the ADDIE model as the primary focus of evaluation rather than merely as preliminary stages in instructional product development. In addition, the study integrates the FAO's Four Pillars of Food Security framework as an analytical lens for assessing the extent to which training design aligns with broader food system objectives. Through this integration, the ADDIE model and the FAO framework function as complementary best-practice frameworks that allow for the evaluation of both instructional rigor and policy relevance. By doing so, this study contributes to the literature by demonstrating that instructional design quality can serve as an early indicator of program readiness and potential effectiveness before implementation occurs.

Based on these considerations, this study aims to evaluate the design quality of the Food Processing Training Program by focusing on the Analysis and Design phases of the ADDIE model and to assess the extent to which the program design aligns with the FAO's Four Pillars of Food Security. Specifically, this study seeks to answer the following research question: How is the Food Processing Training Program designed through the Analysis and Design phases of the ADDIE model, and to what extent does the design align with the FAO's Four Pillars of Food Security?

Literature Review and Conceptual Framework

Food security has the following four crucial dimensions: availability, access, utilization, and stability (FAO, 2008). In Boliko (2019), the FAO states that food security is realized when, on a sustained basis, all people, including the vulnerable, have physical, social, and economic access to adequate, safe, and nutritious food. The four pillars advocate for a food system with emphasis on production and equitable distribution, diversity, and sustainability of supply. In the case of Indonesia, food security relates to local food self-sufficiency and the food entrepreneurial empowerment of regional economic growth drivers.

Regardless of the abundant opportunities for the diversification of local foods in the Central Java Province due to the varied topography and biological resources, community members still depend only on rice and wheat (Rijanta, 2022). Sari et al. (2024), state that teaching community members to process local foods adds value to locally sourced products and strengthens the regional food security.

In the context of training development, the ADDIE model provides a systematic framework consisting of five stages: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009). The first two stages form the foundation that determines the relevance and effectiveness of the program because they include needs analysis, participant characteristics, and the design of learning objectives and strategies (Molenda, 2015).

Nevertheless, some authors have shown that, despite being administratively oriented, the public training programs in Indonesia have not been evaluated from the perspective of instructional design in a systematic manner (Charisma et al., 2025). Conversely, the food security training literature advocates for the incorporation of practical food production skills within the instruction of sustainable and diversified food production theory (Clapp, 2017; Godfray et al., 2018). With this in mind,

integrating the FAO and ADDIE models offers a means to address this issue by developing a model to evaluate how well-designed the training programs developed by local governments for food security are, considering the local context.

Incorporating barriers to alternative food sources and local food resources in the community, the Analysis phase of the ADDIE model can be conceptually aligned with the dimensions of accessibility and availability. Alongside this, the Design phase can be linked to utilization and stability, as it pertains to the design of learning strategies and curricula that promote the ongoing use of local food resources. Thus, the conceptual framework of this study combines the two initial pillars of ADDIE with the FAO's Four Pillars to analyze the alignment between training design and food security principles.

RESEARCH METHODS

This study applied a qualitative method consisting of content analyses of the official documents pertaining to local food-processing training programs conducted by the Central Java Provincial Food Security Agency. This approach was chosen because it allowed me to explore the structure of meaning, patterns of ideas, and implicit assumptions behind policy texts and training materials (Krippendorff, 2019).

Data were gathered concerning the training planning and design elements, including training materials and activity reports for the 2024 fiscal year. The documents were purposefully chosen for their relevance and significance to the first two phases of ADDIE and to focus on the area of instructional design. All documents were authenticated to ensure veracity and reliability to the objectives of the study (Bowen, 2009). In detail, the documents used can be found in Table 1.

Table 1. Local Food Processing Training Program Documents

No.	Documents	Codes
1.	The 2024 training program final report	D1
2.	PRPL report 2024	D2
3.	Entrepreneur tax material	D3
4.	Quality standards for mocaf flour raw materials	D4
5.	Material Strategy economy circular	D5
6.	Business management materials	D6
7.	Local food in building food security material	D7

Data analysis was conducted in several stages. First, all program documents were thoroughly reviewed to identify information related to the Analysis and Design phases of the ADDIE model such as identifying participant needs, setting training objectives, developing materials, learning strategies, and program success indicators. Second, relevant data were coded based on categories deductively derived from the Analysis and Design components of the ADDIE model (Mayring, 2000; Branch, 2009; Holmes & Mellanby, 2022). Third, the coding results were re-analyzed using the FAO's Four Pillars of Food Security framework such as availability, access, utilization, and stability to assess the extent to which the program design reflected food security principles. Through this process, each training design component was evaluated not only from an instructional design perspective but also

examined for its contribution to strengthening local food systems. The analysis results are presented as key themes that describe the program design's characteristics, its alignment with ADDIE principles, and its relationship to the FAO's Four Pillars of Food Security.

The trustworthiness of the data presented in this article have been achieved through the interpretive and reflective analysis model. In this model, the author regards documents and training materials as a particular form of material culture, namely, as a social artifact encapsulating the organization's culture, policy focus, and the educational objectives of the program's designers. It treats documents not merely as administrative data but as cultural texts that mirror institutional thinking and practices related to building food security. It recognizes the limitations of regarding data only from a documentary standpoint, since this type of data largely captures the perspectives of the program designers, rather than the firsthand experience of trainers or participants. To ensure depth of interpretation and transparency throughout the analysis, a reflective journal was maintained to document analytical decisions, developments, and reflections during the research (Denzin, 2012; Vicary et al., 2017).

RESULT AND DISCUSSION

Based on the analysis of the seven major documents pertaining to the Identifying Prospective Recipients and Prospective Locations (PRPL) for 2024, the most recent report on the 2024 training program, and five training materials made by the Central Java Provincial Food Security Agency, the training program aimed to develop entrepreneurial skills in the local food processing sector. The training program aimed to support food diversification based on local potential and cassava-based products, such as mocaf, log rice, and traditional Central Java food. It was thus linked to regional food security strategies. The document analysis showed that the needs analysis and village mapping conducted by the Central Java Food Security Agency are not yet fully structured according to the systematic model described by Branch (2009) in the ADDIE evaluation model.

Analysis Stage in Local Food Processing Training Program

One of the key foundations of developing a training program was the analysis stage. This phase defined the design approach and the significance of the activities in terms of the participant's needs and the goals of the training program. Document review indicated that the needs analysis for the training program narrowed down to two areas: (a) identifying the potentials and the obstacles to local food diversification, and (b) profiling the participants who were to be the focus of the training program. The 2024 PRPL report data indicate that the analysis of the needs was conducted through a field-based approach and direct observations of local food enterprises in several cities and regencies in Central Java. The PRPL 2024 report stated that *"The PRPL identification activity was carried out to obtain data on prospective participants who have active local food processing businesses, taking into account production readiness, equipment capacity, and the potential for developing regional superior products."*

This excerpt explained that the analysis process not only assesses participants' general training needs but also considers their technical readiness and business capacity. Thus, this training program

is intended for business actors who already possess basic skills and abilities and are equipped with the readiness and resources necessary for business development. As a result, the training program's outcomes can be implemented immediately and support participants' business development.

In addition, the final report of the 2024 training program indicated that the analysis of training program needs was conducted in collaboration with local stakeholders, including extension workers and city- and district-level food security agencies. This approach was taken to strengthen the program's relevance, as each training topic and material was developed based on actual field needs rather than solely through administrative planning. This was stated in the following statement: *“The training plan was developed based on the results of the needed assessment of local food businesses and technical input from extension workers in the field regarding the constraints in the production and marketing of local food products.”*

This collaborative approach aimed to ensure that all activities in the training program were designed to address the needs and challenges of business actors, such as limitations in managing local raw materials, access to appropriate technology, and difficulties in marketing processed products derived from local foods.

Table 2 showed that the analysis stage was conducted systematically by integrating quantitative and qualitative data to formulate the training program requirements. The PRPL data provided a strong basis for the Central Java Food Security Agency in determining the participants and the training location. Meanwhile, the final report for the 2024 training program indicates that competency gaps remain. For example, the 2024 training program final report notes that most business actors in the local food sector continue to struggle to access appropriate technologies and high-quality raw materials each year. As noted in the material, *“There are still many business actors who do not understand the principles of raw material sustainability and the use of simple, efficient, and hygienic processing technologies.”*

This statement demonstrated the continued need to introduce simple technologies suitable for business actors to support their production capacity. Thus, this analysis stage not only serves as an administrative basis but also reflects the social and economic realities of participants' actual conditions.

The food training program document stated that the national food policy self-sufficiency diversification strategically shifts focus to locally available diverse resources. This is reflected in the training program materials which give prominence to the *“Local Food Business Management Strategies Based on the Circular Economy”* that focused on supply chain and waste management. The Central Java training program goes beyond the technical knowledge and business skills enhancement to strengthening the local food system's sustainable ecosystem. In addition, analysis of all documents revealed the absence of a formal mechanism for evaluating the results of the needs analysis conducted. Furthermore, none of the documents provided explicit evidence of the use of participant-needs survey instruments or pre-assessments prior to the implementation of the training program.

These limitations could affect the accuracy of the training design by preventing the mapping of participants' needs. However, the active involvement of extension workers and technical partners

in the field identification stage is already a best practice that can serve as a basis for improving future training programs.

Table 2. Results of the Analysis of Local Food Processing Training Program Requirements

Aspects analyzed	Key findings from documents	Source document
Profile participant	Food Entrepreneurs local with capacity production, small to medium, and limited access to technology.	D1
Need technical training	Improving the ability to process flour, mocaf, packaging, and control quality.	D1
Need managerial	Strengthening management, business, digital marketing, and understanding tax regulations.	D3, D5
Constraint field	Lack of innovative products, lack of knowledge about standard quality industry, as well as dependence on certain material standards.	D2, D4
Regional potential	The height production of cassava and tubers in rural areas of Central Java has not yet been optimally utilized.	D1, D6

The Design Stage in Local Food Processing Training Programs

Document analysis suggested the training program offered by the Central Java Provincial Food Security Agency has been intentionally designed to structure the development of local food business practitioners. Each training activity was designed to bridge the gap between strengthening technical skills and improving the managerial capabilities of local food business actors. The training design explicitly emphasized the integration of production, quality, and business sustainability aspects. This was partly reflected in the final report of the 2024 training program that *“The training was conducted with the aimed of improving participants' knowledge and skills in processing local food ingredients into value-added products and supporting food self-sufficiency in the region.”*

This quote emphasizes that each training activity is designed to guide and assist participants in improving their technical skills and making a real contribution to regional food security. This training program covers several key components of learning design (see Table 3). The training design is developed through an integrated thematic approach across topics. As in the training material on mocaf flour quality standards taught by PT Sriboga Flour Mill, which outlines the material with a focus on strengthening the transfer of food production technology that meets industry standards. One part of the material stated, *“The application of quality standards in mocaf flour processing includes controlling moisture content, workplace hygiene, and selecting cassava raw materials that meet wheat flour industry standards.”*

This excerpt indicates that the training design emphasizes quality parity between local products and imported substitutes. This material is a strategic step in increasing the competitiveness of local food products in the domestic market. The integration of technical industry material in this

training program indicates that the program not only focuses on basic skills but also aims to enhance the professional competence of business actors, thereby ensuring they are better prepared to face broader market competition.

In addition, the training program also focused on managerial and business governance aspects. The material on business and taxation emphasizes the importance of tax administration and compliance as formal requirements of business. As explained in the material, as follows, *“business actors were expected to understand their tax obligations and financial record-keeping in order to legally access various government support programs and business financing.”*

This explanation confirms that the training design not only focuses on production capabilities but also aims to strengthen business institutional capacity. Commercial participants who possess solid knowledge of both taxation and financial record-keeping can achieve their goal of growing their business sustainably. This approach indicates that the Central Java Food Security Agency recognizes that the success of local food businesses depends not only on production but also on professional business management.

Furthermore, the material on Circular Economy-Based Local Food Business Management Strategies reinforces the training design's focus on sustainability. The material stated, *“The circular economy concept is applied to optimize resources, minimize waste, and create new added value from the by-products of food production processes.”*

The incorporation of circular economy components into the training design shows the program has expanded the learning dimension from food processing to innovation and the sustainability of business ecosystems. This suggests the training design was created to respond to the participants' immediate and future needs regarding the efficient use of resources and the sustainability of the environment within local food enterprises.

Regarding the learning approach, the final report of the 2024 training program indicates that the training was designed to be interactive and collaborative. The participants were given time to speak, discuss, and rehearse. This approach reflects the principles of adult learning, where participant experience was used as one of the learning materials. Consequently, the training design perceives the participants as knowledge creators, rather than knowledge receivers. This approach has been shown to increase participant motivation and involvement and improve the overall quality of learning that was attained.

Table 3. Training Design Structure for Local Food Processing in Central Java

Component design	Main description	Source document
Objective training	Increase food Entrepreneur skills locally in processing non-rice food materials, especially cassava and tubers, to support diversification in the food area.	D1
Main material	Processing techniques for flour, mocaf, and food-based cassava.	D1
	Improving the quality and standards of food security.	D4
	Strengthening management, business, and taxation.	D3

Component design	Main description	Source document
	Economics circular in business local food.	D5
Method training	Participants reflected on combination theory, practice, direct case studies, and discussions.	D7
Participant target	Actors, craftsmen, local food, and prospective entrepreneurs new to the food industry.	D1
Expected output	Product: food, local, worth, economy, and ready market; increase skills, technical, and business capacity.	D1

The Relationship between Training Programs and the FAO's Four Pillars of Food Security

The analysis of the documents showed that the design of the local food processing training program in Central Java implicitly reflects the four pillars of FAO food security: availability, access, utilization, and stability. Although the documents may not state this explicitly, the approach and the practice entail systematic efforts to enhance regional food security through food diversification based on local potentials.

Regarding accessibility, the 2024 Training Program Final Report and the 2024 PRPL Report highlight the need to make the best use of locally available commodities, such as cassava, corn, and tubers, which were readily available in Central Java. The training aimed to improve participants' ability to process local raw materials into value-added products, including mocaf flour, dried processed products, and wheat-flour substitutes. This effort was undertaken to increase the availability of alternative foods and reduce dependence on imported commodities such as wheat. This approach demonstrates that the training program serves as a strategic instrument for expanding the availability of diverse and sustainable local food sources.

In the access pillar, all documents, including the final report of the 2024 training program and training materials, emphasize the importance of enhancing participants' managerial and marketing competencies. During the training, participants gain an understanding of business strategies, financial planning, and tax obligations to strengthen their businesses' legal standing. This training was designed to enable business actors to expand their marketing networks, enhance product competitiveness, and gain broader access to local and regional markets. Thus, the training program can directly improve small business actors' economic access to resources and to opportunities for food distribution.

The developed technical training, conducted in partnership with industry collaborators such as PT Sriboga Flour Mill and Naruna Ceramics, provides practical training in quality control, food safety, and product innovation using local resources. Participants were instructed on nutrition preservation, hygiene, and industry-standard packaging. Through this improvement in technical capabilities, participants were expected to create products with added value that were marketable, nutritionally adequate, and safe. Therefore, the training initiative was expected to enhance the value-added, safe, and nutritious sustainable food.

Meanwhile, the final pillar stability was reflected in training strategies that emphasize sustainable management of local resources and supply chain efficiency. Training materials on Circular Economy Strategies emphasize recycling, production waste management, and the use of

locally available alternative raw materials to maintain business and production continuity. This approach was taken to ensure that local food availability was not only seasonal but also long-term sustainable by considering environmental and economic factors.

Based on document analysis, there was a strong link between the training program and the four pillars of FAO food security. The training programs run by the Central Java Food Security Agency sought to improve technical skills and, from a holistic perspective, strengthen the local food system from production, distribution, and consumption to supply chain sustainability.

Table 4. The Relationship between the Local Food Processing Training Program and the Four Pillars of FAO Food Security

FAO pillars	Implementation in the training program	Findings from document	Interpretation from content Analysis
Availability	Optimizing local commodities such as cassava and tubers to meet material standards before processing.	Training on production of flour Mocaf, dry process products, and food substitutions.	Increase diversification of food sources and reduce reliance on imports.
Access	Improving business capacity through training management, marketing, and taxation.	Taxation of entrepreneurs' training and materials for small business owners.	Expand the access to the economy and market for local food entrepreneurs.
Utilization	Implementation of standard quality and safety practices in food, along with the development of innovative products.	Quality standards for Mocaf flour raw materials and business management materials focus on quality, innovation, and local products.	Increase the nutritional and safety standards of food products.
Stability	Management sources power locally and improve supply chain efficiency through a draft economy circle.	Strategy emphasizes recycling materials repeatedly and reinforcing the local supply chain.	Ensure continuous production, food security, and a sustainable environment.

This study addressed the gap between the conceptual framework of instructional design, which emphasized the importance of the early stages of design, and training practices in the field, which tended to be implementation oriented. In this context, the research examined the design quality of the Local Food Processing Training Program, focusing on the first two stages of the ADDIE model: Analysis and Design. This view aligned with the emphasis that training program success depended not only on on-site implementation but also on the conceptual clarity developed during the planning stage (Branch, 2009; Molenda, 2015). Thus, this study did not merely evaluate procedures but also

examined the program design as a learning construct that could be academically assessed even before implementation.

Findings indicated that the Analysis phase was conducted through participant identification, mapping of regional potential, and the involvement of extension workers and local stakeholders. The practice showed context sensitivity and a tendency towards participatory practice, which agricultural education research recognizes as essential for improvement in community engagement (Gross et al., 2023; Prasetyo & Firdauzi, 2023; Prasetyo & Dooley, 2025). However, in contrast to an evidence-based approach that prioritizes using existing data to define a competency framework (Barthakur et al., 2022). The program's needs analysis was more limited. Torrance (2007) drew his observations from the lack of documented initial competency assessments or systematic gap analyses, which raises the question of whether the training objectives were evidence-based or merely a function of policy conjecture. In this context, the research findings reinforced the argument that one of the fundamental weaknesses in training practices lay not in implementation, but in the incompleteness of the analytical foundation underpinning program design.

At the Design stage, the program demonstrated a systematic structure of materials and integration between technical and entrepreneurial aspects. The design aimed to combine production needs with the potential to enhance economic value for the participants. In addition, the integration of the field issue of cassava processing and the training materials exhibited thematic coherence in the organization of the curriculum. Within the framework of instructional design, this reflected the principle of constructive alignment, in which objectives, learning activities, and content were structured to support one another (Martin, 2011; Koc, 2020). However, as in the Analysis phase, the program design was not yet supported by operationally defined learning performance indicators. Due to the lack of quantifiable measures, the program staff tended to rely on perception-based evaluations or success stories from program management, which further limited the program's ability to objectively assess participants' achievements (Sitzmann & Weinhardt, 2019; Farrelly et al., 2025). This finding reaffirmed that the quality of instructional design could not be assessed solely by the completeness of materials but also by the clarity of the accompanying evaluation parameters.

When viewed through the Food and Agriculture Organization's Pillars of Food Security framework, there was substantive alignment between the program design and the dimensions of food security. During the Analysis phase, barriers to local potential and production were mapped to provide additional understanding of food availability and access, and the Design phase articulated utilization and stability through components related to food safety, quality, and business management. Still, this remained implicit as it was not addressed through specific indicators for each pillar. Therefore, the food security measure is systematically justifiable for the program (FAO, 2017; Prasetyo et al., 2025). It demonstrated that the integration between training design and the wider developmental goals still needed to be reinforced both conceptually and operationally.

The analysis findings also described a phenomenon related to training in Indonesia, where the ADDIE approach was observed to be more common as a framework for product development (research and development) than as an evaluative framework for program design. In this sense, this study presented a distinct positioning by prioritizing the Analysis and Design phases, which vindicated that instructional design as a research output could be valuable and that evaluative

measures on it could be conducted even before implementation. Thus, this study filled a gap in the literature by demonstrating that evaluation during the pre-implementation stage played a strategic role in ensuring the conceptual readiness of a training program.

However, this study had limitations that required careful consideration. Due to the document-based analysis, conducting interviews with program developers to directly confirm aspects of the design process or measuring the design process's impacts on participants over time was not possible. Furthermore, with the limited emphasis on the Analysis and Design stages, the empirical aspects of the Implementation and Evaluation stages remained undisclosed. Nevertheless, these limitations were conceptual and simultaneously reinforced the study's status as a pre-implementation evaluation.

CONCLUSION AND SUGGESTION

This research demonstrates that the quality of a training program is determined not solely by its field execution but also by the strength of the instructional design established during the planning phase. By focusing the evaluation on the Analysis and Design phases of the ADDIE model, this study shows that instructional design can serve as a standalone unit of analysis for assessing a program's conceptual readiness prior to the development and implementation stages. These findings confirm the argument that a program that appears to function well is not necessarily underpinned by a systematic, measurable, and replicable design foundation across different contexts. In the case of the Local Food Processing Training Program, the design demonstrated substantive alignment with the goal of strengthening regional food security through the utilization of local food potential; however, this linkage remained implicit and had not yet been translated into performance indicators that directly represent dimensions of food security.

The study's primary contribution lies in its use of the ADDIE model and the FAO's Four-Pillar Framework of Food Security as a form of theoretical triangulation to evaluate the quality of the training program's design. This approach extends the application of ADDIE traditionally used as a framework for developing learning products to an evaluation instrument for assessing the robustness of a program's design prior to implementation. Thus, the research not only affirms the relevance of the ADDIE model in public training but also demonstrates that the quality of the Analysis and Design phases can serve as a preliminary indicator of a program's potential effectiveness in supporting broader development goals. From a theoretical perspective, these findings contribute to the instructional design literature by demonstrating that design evaluation can bridge the gap between learning quality and the achievement of public policy objectives, particularly in strengthening local food systems.

The practical implications of this research highlight the need to strengthen the needs analysis process by using more systematic, evidence-based instruments to map participants' baseline competencies and identify actual skill gaps in the field. Furthermore, learning objectives need to be translated into operational and measurable performance indicators so that program success can be evaluated objectively, rather than relying solely on participant perceptions or administrative reports. Integrating the FAO's Four Pillars of Food Security framework into the program planning process is also crucial to ensure that training serves not merely as a means to enhance technical skills, but also

as a strategic instrument to support food availability, access, utilization, and stability at the local level. In this way, training programs can be designed to generate change at the individual level while also making a tangible contribution to strengthening local food systems.

However, this study has limitations; the analysis was based on program documents and focused on the Analysis and Design phases, meaning the relationship between design quality and implementation outcomes could not be empirically tested. Therefore, future research should extend the scope to include the Development, Implementation, and Evaluation phases to understand how design quality influences program effectiveness, participant behavior change, the sustainability of local food enterprises, and contributions to community food security. Longitudinal studies and action research are also needed to strengthen empirical evidence regarding the link between instructional design quality and program impact on the broader food system. Thus, evaluating instructional design contributes not only to the development of learning theory but also to strengthening evidence-based practices and policies for building local food security.

REFERENCES

- Barthakur, A., Joksimovic, S., Kovanovic, V., Corbett, F. C., Richey, M., & Pardo, A. (2022). Assessing the sequencing of learning objectives in a study program using evidence-based practice. *Assessment & Evaluation in Higher Education*, 47(8), 1429–1443. <https://doi.org/10.1080/02602938.2022.2064971>
- Boliko, M. C. (2019). FAO and the situation of food security and nutrition in the world. *Journal of Nutritional Science and Vitaminology*, 65, S4-S8. <https://doi.org/10.3177/jnsv.65.S4>
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
- Branch, R. M. (2009). *Instructional design: The ADDIE approach*. Springer. <https://doi.org/10.1007/978-0-387-09506-6>
- Charisma, D., Hermanto, B., Purnomo, M., Herawati, T., & Charina, A. (2025). Sustainable business through local strength: A qualitative study of financial, social, and cultural strategies in Bandung's culinary micro-enterprises. *Sustainability*, 17(11), 5028. <https://doi.org/10.3390/su17115028>
- Clapp, J. (2017). Food self-sufficiency: Making sense of it, and when it makes sense. *Food Policy*, 66, 88–96. <https://doi.org/10.1016/j.foodpol.2016.12.001>
- Cotter, S., Yamamoto, J., & Stevenson, C. (2023). A systematic characterization of food safety training interventions using the analyze, design, develop, implement, evaluate (ADDIE) instructional design framework. *Food Control*, 145, 109415. <https://doi.org/10.1016/j.foodcont.2022.109415>
- Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research*, 6(2), 80-88. <https://doi.org/10.1177/1558689812437186>

- Farrelly, D., Esposito, L., Maulbeck, J., Kates, L., Morris, J., & Espinet, I. (2025). The collaborative development of a performance-based rubric for coaching teacher candidates in fieldwork practice. *The Teacher Educator*, 61(2), 255–282. <https://doi.org/10.1080/08878730.2025.2544925>
- Food and Agriculture Organization (FAO). (2008). *An introduction to the basic concepts of food security*. <https://www.fao.org/4/al936e/al936e00.pdf>
- Food and Agriculture Organization (FAO). (2017). *The future of food and agriculture: Trends and challenges*. <https://www.fao.org/3/i6583e/i6583e.pdf>
- Godfray, H. C. J., Beddington, J. R., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., Pretty, J., Robinson, S., Thomas, S. M., & Toulmin, C. (2018). Food security: The challenge of feeding 9 billion people. *Science*, 327(5967), 812–818. <https://doi.org/10.1126/science.1185383>
- Gross, G., Ling, R., Richardson, B., & Quan, N. (2023). In-person or virtual training?: Comparing the effectiveness of community-based training. *American Journal of Distance Education*, 37(1), 66–77. <https://doi.org/10.1080/08923647.2022.2029090>
- Holmes, C., & Mellanby, E. (2022). Debriefing strategies for interprofessional simulation—a qualitative study. *Advances in Simulation*, 7(1), 1–19. <https://doi.org/10.1186/s41077-022-00214-3>
- Koc, E. (2020). Design and evaluation of a higher education distance eap course by using the ADDIE model. *Elektronik Sosyal Bilimler Dergisi*, 19(73), 522–531. <https://doi.org/10.17755/esosder.526335>
- Krippendorff, K. (2019). *Content analysis*. Sage Publications, Inc.
- Martin, F. (2011). Instructional Design and the Importance of Instructional Alignment. *Community College Journal of Research and Practice*, 35(12), 955–972. <https://doi.org/10.1080/10668920802466483>
- Mayring, P. (2000). Qualitative content analysis. *Forum Qualitative Sozialforschung Forum: Qualitative Social Research*, 1(2), 1089. <https://doi.org/10.17169/fqs-1.2.1089>
- Molenda, M. (2015). In search of the elusive ADDIE model. *Performance Improvement*, 42(5), 34–36. <https://doi.org/10.1002/pfi.4930420508>
- Prasetyo, A. S., Dooley, K. E., Widyastuti, K., & Firdauzi, A. (2025). Comparing national food security policies in Indonesia and Thailand: A systematic meta-synthesis approach. *Frontiers in Sustainable Food Systems*, 9, 1676641. <https://doi.org/10.3389/fsufs.2025.1676641>
- Prasetyo, A. S., & Firdauzi, A. (2023). Determinants of farmer's participation in implementation community empowerment: A case study of thematic village in Indonesia. *Habitat*, 34(2), 178–189. <https://doi.org/10.21776/ub.habitat.2023.034.2.16>
- Evaluation of Local Food Processing Training Design Based on ADDIE AND FAO Food Security Pillars in Central Java (Prasetyo et al., 2026) 630

- Prasetyo, A. S., & Dooley, K. (April 2025). Challenges facing extension agents in the implementation of participatory communication on the urban agriculture program at Semarang, Indonesia [Poster presentation]. Conference of the Association for International Agricultural and Extension Education (AIAEE), Scotland. <https://doi.org/10.13140/RG.2.2.26387.59682>
- Rijanta, R. (2020). The prospects & challenges of local foods production in rural Java, Indonesia: the case of Kulonprogo Regency. *Human Geographies: Journal of Studies & Research in Human Geography*, 14(2), 321-335. <https://doi.org/10.5719/hgeo.2019.141.9>
- Sari, R., Muslim, M., & Ameliana, Y. (2024). Strategies for improving local food security in developing countries. *Advances in Community Services Research*, 2(2), 98-110. <https://doi.org/10.60079/acsrv2i2.364>
- Sitzmann, T., & Weinhardt, J. M. (2019). Approaching evaluation from a multilevel perspective: A comprehensive analysis of the indicators of training effectiveness. *Human Resource Management Review*, 29(2), 253-269. <https://doi.org/10.1016/j.hrmr.2017.04.001>
- Torrance, H. (2007). Assessment as learning? How the use of explicit learning objectives, assessment criteria and feedback in post-secondary education and training can come to dominate learning. *Assessment in Education: Principles, Policy & Practice*, 14(3), 281-294. <https://doi.org/10.1080/0969594070159186>
- Vicary, S., Young, A., & Hicks, S. (2017). A reflective journal as learning process and contribution to quality and validity in interpretative phenomenological analysis. *Qualitative Social Work*, 16(4), 550-565. <https://doi.org/10.1177/1473325016635244>