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Development of Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation at the University Level of Education

YAKI, A. A[1].
Email: yaki.aa@futminna.edu.ng
Phone Number: +2347067074366

SAIFULLAHI, M[1].
Email: muhammed.saifullahi@futminna.edu.ng
Phone Number: +2348083365024

BAWA, S[1].
Email: saratu.bawa@futminna.edu.ng
Phone Number: +2347056590755

GAMBARI, A. I[2].
Email: gambari@futminna.edu.ng
Phone Number: +2348036897955

[1]Department of Science Education, Federal University of Technology Minna, Niger State
[2]Department of Educational Technology, Federal University of Technology Minna. Niger State

Abstract
The educational system of many nations is undergoing noteworthy changes with the implementation of policies and instructional strategies that will help the future workforce and learners to acquire 21st-century skills. There seems to be a paucity of pedagogical modules to guide university administrators in implementing it in the training of their lecturers. Therefore, this study focused on the Development of a Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation. A three-round Modified Delphi method was used to develop the Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation. For the development of the module, ten (10) experts were recruited from the field of Science Education, and curriculum development and planning with a minimum rank of Senior Lecturer from the Federal University of Technology, Minna, and participated in the study. Mean experts' consensus was ensured using Content Validity Ratio Index (CVRi), Item Content Validity Index (I-CVI), and Scale Content Validity Index (S-CVI). The findings show that experts' consensus was attained, and the module has good content validity. The findings also indicate that all the phases, elements, and items for module validation have CVRi of greater than 0.5 and therefore are very appropriate, ensuring the attainment of experts' consensus. It was confirmed from the computation that all the phases, elements, and items for module validation have I-CVI of >.70 and Scale Content Validity Index (S-CVI) of 0.81, 0.89, and 0.90 for the phases, elements and items used in developing the module, respectively. It was concluded that the general outlook of the module is appropriate and can be used for the training. Given the findings of this study, it is recommended that the developed Pedagogical Capacity Training Module should be implemented with University and Colleges of Education lecturers and that lecturers should be encouraged to implement the Pedagogical Module in their classroom instruction.

Key Words: *Pedagogical Capacity Training Module, Lecturers' Skills, Curriculum Implementation*

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Introduction

The trends in the global economy have created a paradigm shift in the skills needed in the labour market, which has, in turn, necessitated a shift in the process of education (the process of learning in general and pedagogical practices, particularly). 21st-century skills such as critical thinking, creativity, and collaboration are important requirements of the labour market and for competing successfully in the global market (Yaki, 2022). Consequently, the educational system of many nations is undergoing noteworthy changes with the implementation of policies and instructional strategies that will help the future workforce and learners to acquire 21st-century skills.

It is in recognition of this that the National University Commission (NUC) has come up with the Core Curriculum Minimum Academic Standards (CCMAS) to make university education in Nigeria more relevant to the manpower needs of the 21st-century. The focus of the CCMAS is to foster meaningful learning and the acquisition of 21st-century skills/ deep thinking, or higher-order thinking skills. The Successful implementation of the CCMAS will largely lie in the effective delivery and assessment of the course content. The tutors need to overhaul their approaches to teaching through the adoption of innovative pedagogy and assessment practices towards achieving the CCMAS learning objectives. Therefore, the need for professional development on the implementation of this curriculum.

The effective curriculum implementation requires lecturers to possess the necessary pedagogical skills and competencies. However, many lecturers face challenges in adapting to new curriculum demands, which can impact the quality of teaching and learning (Yaki *et al.,* 2020). To address this issue, there is a need for targeted professional development initiatives that focus on enhancing lecturers' pedagogical capacity. The rapidly changing educational landscape demands that lecturers stay up-to-date with innovative pedagogical approaches and technologies. Curriculum reforms often require lecturers to adopt new teaching methods, assessment strategies, and content delivery approaches. However, without support and training, lecturers may struggle to implement these changes effectively. The education sector is undergoing rapid changes, driven by factors such as technological advancements, shifting student demographics, and evolving societal needs (Saifullahi *et al.,* 2024). Curriculum reforms are being implemented to ensure students acquire the knowledge, skills, and competencies required to succeed in the 21st century. However, the success of these reforms depends on the ability of lecturers to adapt and implement them effectively.

The development of a pedagogical capacity training module is crucial for enhancing lecturers' skills and competencies in implementing curriculum reforms effectively (Chunmeng, *et al*, 2022). Lecturers face challenges in adapting to new curriculum demands, including limited pedagogical capacity, insufficient training and support, and resistance to change. A well-designed training module can provide lecturers with the knowledge, skills, and confidence to

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design and deliver instruction that aligns with curriculum requirements, promotes deep understanding, and supports diverse student needs. By focusing on instructional design, teaching assessment, and classroom management, the module can help lecturers develop the pedagogical capacity needed to improve student learning outcomes. Ultimately, the goal is to empower lecturers to become confident, reflective, and effective educators who can implement curriculum reforms with fidelity and enthusiasm.

Given the importance of pedagogical capacity for effective curriculum implementation, there is a need for targeted training initiatives that support lecturers in developing their skills and competencies. A pedagogical capacity training module can provide lecturers with the knowledge, skills, and confidence to implement curriculum reforms effectively.

Aim and Objectives of the Study

The main aim of this study is to develop a Pedagogical Capacity Training Module that could Enhance Lecturers' Skills for Effective Curriculum Implementation at the University level of Education in Nigeria. The specific objectives are:

1. To determine the phases/stages of the Pedagogical Capacity Training Module that could Enhance Lecturers' Skills for Effective Curriculum Implementation at the University level of Education in Nigeria?
2. To examine the elements/features of the Pedagogical Capacity Training Module that could Enhance Lecturers' Skills for Effective Curriculum Implementation at the University level of Education in Nigeria?
3. To ensure experts' consensus on the validity of the Pedagogical Capacity Training Module that could Enhance Lecturers' Skills for Effective Curriculum Implementation at the University level of Education in Nigeria?

Research Questions

The following research questions were raised to guide the study:

1. What are the phases/stages of the Pedagogical Capacity Training Module that could Enhance Lecturers' Skills for Effective Curriculum Implementation at the University level of Education in Nigeria?
2. What are the elements/features of the Pedagogical Capacity Training Module that could Enhance Lecturers' Skills for Effective Curriculum Implementation at the University level of Education in Nigeria?
3. What is the experts' consensus on the validity of the Pedagogical Capacity Training Module that could Enhance Lecturers' Skills for Effective Curriculum Implementation at the University level of Education in Nigeria?

Research Methodology

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The modified Delphi method was used to develop the Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation. The modified Delphi process outlined by Stewart and Shamdasami (1980) was adopted and used in the study. For the development of the instruments, ten (10) experts were recruited from the field of Science Education, and curriculum development and planning with a minimum rank of Senior Lecturer from the Federal University of Technology, Minna, and participated in the study. Mean experts' consensus was ensured using Content Validity Ratio Index (CVR_i), Item Content Validity Index (I-CVI), and Scale Content Validity Index (S-CVI). The phases/elements/items were scored by the specialists/experts based on a four-point rating scale of Very Appropriate (VA), Appropriate (A), Not Appropriate (NA), NAA, and Not Appropriate at All (NAA). The element/phase/item rated 1 or 2 by the expert is considered not appropriate, while the element rated 3 or 4 by the expert is considered appropriate. The Content Validity Ratio Index (CVR_i), Item Content Validity Index (I-CVI), and Scale Content Validity Index (S-CVI) were calculated from the ratings of the experts using equations I, II, and III viz:

$$CVRi = \frac{\left[ne - \left(\frac{N}{2}\right)\right]}{\frac{N}{2}} \qquad (Eqn\ I)$$

$$I - CVI = \frac{N0\ of\ Appropriate\ Items\ (score\ 3\ or\ 4)}{Number\ of\ Experts} \qquad (Eqn\ II)$$

$$S - CVI = \frac{\sum[I - CVI]}{Number\ of\ Items} \qquad (Eqn\ III)$$

Where **ne** is the number of experts that rated the item appropriate, **N** is the number of experts, CVR_i is the Content Validity Ratio Index, **I-CVI** is the Item Content Validity Index, and **S-CVI** is the Scale Content Validity Index.

Presentation of Results

Module Development: The modified Delphi method was used to develop the Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation. The modified Delphi process outlined by Stewart and Shamdasami (1980) was adopted and used in the study.

First Round Delphi: Elements Generation to be Included in the Module

Current literature was reviewed, and the elements to be included in the Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation were generated. Numerous pedagogical elements/components were implemented in the classroom with different levels of students by different researchers to enhance students' skills for effective curriculum implementation. Easterday (2014) conducted research and used a Design-Based Learning approach, which involves four phases: an analysis of real-world issues; solution

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development based on existing design concepts and technological advancements; evaluating and refining solutions in iterative cycles; and reflection to develop design ideas and improve solution implementation.

Based on ABET (Accreditation Board for Engineering and Technology), engineering design activities can be divided into nine activities, namely: (1) recognizing the need; (2) defining the problem; (3) planning the project; (4) gathering information; (5) conceptualizing alternative approaches; (6) evaluating the alternatives; (7) selecting the best alternatives; (8) communicating the design; and (9) implementing the preferred approach (Syukri, *et al.,* 2018). Yildiz and Ozdemir (2018) conducted a study on the effects of engineering design processes on spatial abilities of middle school students and utilized five steps of Engineering Design Processes: identifying the problem, developing possible solutions, analyzing the solutions, optimizing the solutions (testing, evaluating and repeating if necessary), and communication. Altan *et al.,* (2018) have developed another pedagogical model for the development of decision-making skills. The model contained five (5) section with nine (9) steps which includes: unpack the unit grand engineering challenge (identification of the problem), development of scientific knowledge and skills through series of mini-challenge and investigation (research need, development of possible solution, selection of the best solution and construction of the prototype), apply findings to potential design solution (test and evaluate), construct a solution to a grand design challenge (evaluation and communication) and test, improve and communicate (redesign and make decision).

Geitz and de Geus (2019) developed an engineering design Learning model which involves five phases: (i) identify problems in the context of current situations and generate ideas; (ii) define a solution's objectives (iii) design and development; (iv) demonstration and reflection; (v) communication and evaluation. This model focuses on identifying issues in situations at present and producing innovative ideas to encourage students to design a solution based on their 21st-century skills. Research conducted by Azizan and Abu Shamsi (2022) provided five (5) phases of Design-Based Learning. These are: 1) identify the problem in the context of the current situation and generate idea; 2) define the solution objectives; 3) design and development; 4) demonstration and reflection; and 5) communication and evaluation. Başpinar (2022) investigated the effect of engineering design-based science instruction on 6th-grade students' astronomy understandings and engineer career interests and employed six (6) stages EDP viz: 1) Describe a problem, 2) Finding possible solutions, and 3) Choosing the best solution, 4) Building the prototype; planning prototype activity, planning design activity, 5) Test the prototype 6) Evaluation and presentation of each group project.

Reviewed work indicated that all the pedagogical phases reviewed provide a learning activity characterized by open-ended problem, giving both teachers and students enough flexibility for teaching and learning, presenting real-life scenarios for positioning the design challenge and arriving at a solution, multidisciplinary activity, development of prototype, hands-on techniques, tools, and materials for prototyping or testing, minds-on tools for design documentation and

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visualization during the defining phases. All the pedagogical phases reviewed have some elements in common. Looking at the stages in each pedagogy, so many elements are common to each other and have similar meaning. After compiling the generated innovative pedagogy for curriculum implementation, experts in the field of science education, curriculum development, and planning from the Department of Science Education, Federal University of Technology, Minna, were recruited and participated in the development of the module.

Research Question One:

What are the phases/stages of the Pedagogical Capacity Training Module that could enhance lecturers' skills for effective curriculum implementation at university level of Education in Nigeria?

To answer this research question, a modified Delphi method was used, and the result of the expert's consensus is presented in Tables 1 and 2.

Second Round Modified Delphi

The initial Delphi pedagogy phases generated by the researchers is distributed to the recruited expert requiring them to rate the items with respect to its element using four choice scale of Very Appropriate (VA), Appropriate (A), Not Appropriate (NA), NAA and Not Appropriate at All (NAA) in terms of the relevance, suitability, arrangement, user friendly and other variable relevant to the module. Content Validity Indices with CVRi, I-CVI, and S-CVI were used to analyze experts' responses, and the result is presented in Table 1.

Table 1: CVRi, I-CVI, and S-CVI of First Round Delphi Phases Issue Experts' Responses

S/N	Elements	NE	EC (3&4)	I-CVI	CVR_i	Decision
1	Analysis of real-world issues(identification of the problem)	10	9	0.9	0.8	CR
2	Defining the problem	10	5	0.5	0.0	CNR
3	Generate idea/gathering information	10	10	1	1.0	CR
4	Developing possible solutions	10	8	0.8	0.6	CR
5	Analyzing the solutions and select the best solution	10	6	0.6	0.2	CNR
6	Designing of prototype	10	9	0.9	0.8	CR
7	Construction of the prototype	10	6	0.6	0.2	CNR
8	Conceptualizing alternative approaches	10	3	0.3	-0.4	CNR
9	Optimizing the solutions (testing and evaluating)	10	7	0.7	0.4	CNR
10	Refining solutions in iterative cycles	10	8	0.8	0.6	CR
11	Communicating the findings	10	9	0.9	0.8	CR
12	Reflection to develop design ideas and improve solution implementation.	10	6	0.6	0.2	CNR

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	10	**S-CVI =0.72**	**CR**

Key:
NE: Number of Experts; EC: Experts Consensus; I-CVI: Item Content Validity Index CVRi: Content Validity Ratio Index; CR: Consensus Reached; CNR: Consensus Not Reached; S-CVI: Scale Content Validity Index

Table 1 present CVRi, I-CVI and S-CVI of First Round Phases Issue Experts' Responses. It was reveal from the table that phases 1, 3, 4, 6, 10, and 11 had a CVRi greater than 0.5 indicating consensus reached, which is the decision region while phases 2, 5, 7, 8, 9 and 12 had a CVRi of less than 0.5 indicating consensus not reached. It was revealed from the computation also that Scale Content Validity Index (S-CVI) is 0.72, which did not align with acceptable values as recommended by Polit and Beck (2006); Li & Lopes (2004). Therefore, it was concluded that expert consensus on the appropriateness of the general pedagogical phases is not attained.

Third Round Delphi

Feedback from the second-round responses is provided to the selected expert, and the third round Delphi, based on second-round responses, comments, and suggestions, is constructed and distributed to the experts. In the third round, each expert received a third round that included the element and summary of their ratings, CVRi, I-CVI, and S-CVI from round two. Experts were asked to reevaluate their opinions in this round when they differed significantly from the other experts. The purpose of the third round is to provide feedback from the previous round and to reach a final consensus, or to indicate that consensus cannot be reached. Third round expert responses are collected and analyzed. The reports are presented in Table 2.

Table 2: CVRi, I-CVI, and S-CVI of First Round Delphi Phases Experts' Responses

S/N	Elements	NE	EC (3&4)	I-CVI	CVR_i	Decision
1	Analysis of real-world issues(identification of the problem)	10	9	0.9	0.8	CR
2	Defining the problem	10	8	0.8	0.6	CR
3	Generate ideas/gathering information	10	10	1	1.0	CR
4	Developing possible solutions	10	8	0.8	0.6	CR
5	Analyzing the solutions and select the best solution	10	9	0.9	0.8	CR
6	Designing of prototype	10	9	0.9	0.8	CR
7	Construction of the prototype	10	8	0.8	0.6	CR
8	Conceptualizing alternative approaches	10	3	0.3	-0.4	CNR
9	Optimizing the solutions (testing and evaluating)	10	8	0.8	0.6	CR
10	Refining solutions in iterative cycles	10	8	0.8	0.6	CR
11	Communicating the design	10	9	0.9	0.8	CR

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12	Reflection to develop design ideas and improve solution implementation.	10	8	0.8	0.6	CR
		10		**S-CVI =0.81**		**CR**

Key:
NE: Number of Experts; EC: Experts Consensus; I-CVI: Item Content Validity Index; CVRi: Content Validity Index; CR: Consensus Reached; CNR: Consensus Not Reached; S-CVI: Scale Content Validity Index

Table 2 presents Content Validation Indices of Third Round Feedback and Experts' Responses. It was revealed from the table that consensus is reached for all phases except for phase eight (8), with CVRi of less than 0.5. It was revealed from the result also that Scale Content Validity Index (S-CVI) is 0.81, which aligned with acceptable values as recommended by Polit and Beck (2006); Li & Lopes (2004). Therefore, it was concluded that expert consensus on the appropriateness of the phases used in the development of the module is attained. However, experts recommended that phase eight (8) should be removed and phases 1 and 2, 4 and 5, 6 and 7, 9 and 10, and 11 and 12 should be merged respectively. Phase 8 is removed, and recommendations to merge some phases are considered, and the final copy of the phases used in the development of the module is presented in Table 3.

Table 3: Final Developed Phases that Form the Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation at University Level of Education in Nigeria

S/N	Elements	Final Modification
1	Analysis of real-world issues(identification and defining of the problem)	1 and 2 merged
2	Generate idea/gathering information	Unmerged 3
3	Selecting the best solution	4 and 5 merged
4	Designing and constructing a prototype	6 and 7 merged
5	Optimizing the solutions (testing, evaluating, and refining solutions in iterative cycles)	9 and 10 merged
6	Communication and reflection to develop design ideas and improve solution implementation.	11 and 12 merged

Table 3 presents the final developed phases that form the pedagogical capacity training module for enhancing lecturers' skills for effective curriculum implementation. The six phases are analysis of real-world issues, generate ideas, developing and selecting the best solution, designing and constructing of prototype, optimizing the solutions, and communication and reflection

Research Question Two:

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What are the elements/features of the Pedagogical Capacity Training Module that could enhance lecturers' skills for effective curriculum implementation at University level of Education in Nigeria?

To answer this research question, a modified Delphi method was used, and the result of the expert's consensus is presented in Tables 4 and 5.

Second Round Delphi: Development of the Module Elements

The initial Delphi pedagogy elements identified by the researchers from the reviewed literature are distributed to the recruited experts, requiring them to rate the. Content Validity Indices with CVRi, I-CVI, and S-CVI were used to analyze experts' responses, and the result is presented in Table 4.

Table 4: CVRi, I-CVI and S-CVI of Second Round Delphi Element Issue Experts' Responses

S/N	Items	NE	EC (3&4)	I-CVI	CVR_i	Decision
1	Presentation of an open-ended problem	10	9	0.9	0.8	CR
2	Presentation of a real-world problem Scenario	10	7	0.7	0.4	CNR
3	Hands-on activities	10	8	0.8	0.6	CR
4	Mind-on activities	10	8	0.8	0.6	CR
5	Inquiry	10	4	0.4	-0.2	CNR
6	Experimentation	10	6	0.6	0.2	CNR
7	The teacher as a facilitator	10	6	0.6	0.2	CNR
8	Collaboration	10	9	0.9	0.8	CR
9	Individualized learning	10	4	0.4	-0.2	CNR
10	Group project/prototyping	10	5	0.5	0	CNR
11	Communication	10	5	0.5	0	CNR
12	Authentic assessment	10	9	0.9	0.8	CR
13	Technology integration in learning	10	7	0.7	0.4	CNR
		10		**0.669**		**CNR**

Key:

NE: Number of Experts; EC: Experts Consensus; I-CVI: Item Content Validity Index CVRi: Content Validity Index; CR: Consensus Reached; CNR: Consensus Not Reached; S-CVI: Scale Content Validity Index

Table 4 presents the CVRi, I-CVI, and S-CVI of Second Round Delphi Element Issue Experts' Responses. The analysis shows that elements 2, 5, 6, 7, 9, 10, 11, and 13 have the CVRi of less than 0.5 and therefore are not appropriate and shall be reviewed. Items 1, 2, 4, 8, and 12 have a CVRi of greater than 0.5, which is the decision value, and therefore concluded that the consensus reached can be included in the training module. It was revealed from the

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computation also that Scale Content Validity Index (S-CVI) is 0.669, which did not align with acceptable values as recommended by Polit and Beck (2006); Li & Lopes (2004). A plethora of corrections, suggestions and comments were made by the experts and the corrections were done and sent it to the experts as a second round Delphi instrument

Third Round Delphi: Development of the Module Elements

Feedback from Second-Round responses is provided to the selected expert and the third round Delphi, based on second round responses, comments, and suggestions, is constructed and distributed to the experts. In the third round, each expert received a third round that included the element and summary of their ratings CVR from round two. Experts were asked to reevaluate their opinions in this round when they differed significantly from the other experts. The purpose of the third round is to provide feedback from the previous round and to reach a final consensus or to indicate that consensus cannot be reached. Third round expert responses are collected and analyzed. The reports are presented in Table 5.

Table 5: CVRi, I-CVI, and S-CVI of Third Round Delphi Element Issue Experts' Responses

S/N	Items	NE	EC (3&4)	I-CVI	CVR_i	Decision
1	Presentation of an open-ended problem	10	9	0.9	0.8	CR
2	Presentation of a real-world problem Scenario	10	10	1	1	CR
3	Hands-on activities	10	10	1	1	CR
4	Mind-on activities	10	10	1	1	CR
5	Inquiry	10	9	0.9	0.8	CR
6	Experimentation	10	8	0.8	0.6	CR
7	The teacher as a facilitator	10	8	0.8	0.6	CR
8	Collaboration	10	9	0.9	0.8	CR
9	Individualized learning	10	4	0.4	-0.2	CNR
10	Group project/prototyping	10	10	1	1	CR
11	Communication	10	10	1	1	CR
12	Authentic assessment	10	9	0.9	0.8	CR
13	Technology integration in learning	10	10	1	1	CR
		10		**0.89**		**CR**

Keys:
NE: Number of Experts; EC: Experts Consensus; I-CVI: Item Content Validity Index; CR: Consensus Reached; CVRi: Content Validity Index; CNR: Consensus Not Reached; S-CVI: Scale Content Validity Index

Table 5 presents the CVRi, I-CVI, and S-CVI of the Third Round Delphi Element Issue Experts' Responses. The analysis shows that element number 9 (individualized learning) had a CVRi of less than 0.5 and therefore is not appropriate and shall be reviewed. It was concluded that the

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element should not be removed from the training module. While all the remaining elements had CVRi of greater than 0.5, which is the decision value, and therefore concluded that consensus is reached and can be included/retained in the training module. It was revealed from the computation also that Scale Content Validity Index (S-CVI) is 0.89, which aligned with acceptable values as recommended by Polit and Beck (2006); Li & Lopes (2004). Few corrections were made by the experts, and the corrections were made before the development of the final copy of the module

Research Question Three:

What is the expert consensus on the validity of the general outlook of the Pedagogical Capacity Training Module that could enhance lecturers' skills for effective curriculum implementation at university level of Education in Nigeria?

To answer this research question, a modified Delphi method was used, and the result of the expert's consensus is presented in Tables 6, 7, and 8.

First Round Delphi: General Outlook of the Developed Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation at University Level of Education in Nigeria

The initial Delphi items generated to assess the developed Pedagogical Capacity Training Module is sent to the recruited expert, requiring them to rate the items using a four-point scale of Very Appropriate (VA), Appropriate (A), Not Appropriate (NA), NAA, and Not Appropriate at All (NAA). Content Validity Indices with CVRi, I-CVI, and S-CVI were used to analyze experts' responses, and the result is presented in Tables 6, 7, and 8.

Table 6: CVRi, I-CVI, and S-CVI of First Round Delphi General Aspect of the Developed Pedagogical Capacity Training Module

S/N	Items	NE	EC (3&4)	I-CVI	CVR_i	Decision
1	Arrangement of instructional materials	10	6	0.6	0.2	CNR
2	Logical arrangement of pedagogical phases	10	7	0.7	0.4	CNR
3	Possibility for attaining the objectives of the module	10	5	0.5	0.0	CNR
4	Activities (design-based task presentation)	10	7	0.7	0.4	CNR
5	Time allocation for different activities	10	3	0.3	-0.4	CNR
6	Clarity of instruction	10	6	0.6	0.2	CNR
7	Well organization of evaluation rubrics	10	7	0.7	0.4	CNR
8	Grammatical usage	10	5	0.5	0.0	CNR
9	Adequate assignment of the teacher role	10	7	0.7	0.4	CNR
10	Student's role/activities appropriate for the level of trainee	10	4	0.4	-0.2	CNR

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		10		**S-CVI =0.57**	**CNR**

Key:
NE: Number of Experts; EC: Experts Consensus; I-CVI: Item Content Validity Index CVRi: Content Validity Index; CR: Consensus Reached; CNR: Consensus Not Reached; S-CVI: Scale Content Validity Index

Table 6 presents the CVRi, I-CVI, and S-CVI of the First Round Delphi General Aspect of the Developed Pedagogical Capacity Training Module. The analysis shows that all items had a CVRi of less than 0.5 with an S-CVI of 0.57, and therefore, the module with respect to the items is not appropriate and shall be reviewed.

Second Round Delphi: Assessing the General Outlook Module

Feedback from first-round responses is provided to the recruited expert, and the second round Delphi, based on first-round responses and suggestions, is constructed and distributed to the experts. Third round expert responses are collected and analyzed. The reports are presented in Table 7.

Table 7: CVRi, I-CVI, and S-CVI of Second Round Delphi General Aspect of the Developed Pedagogical Capacity Training Module

S/N	Items	NE	EC (3&4)	I-CVI	CVR_i	Decision
1	Arrangement of instructional materials	10	7	0.7	0.4	CNR
2	Logical arrangement of pedagogical phases	10	7	0.7	0.4	CNR
3	Possibility for attaining the objectives of the module	10	6	0.6	0.2	CNR
4	Activities (design-based task presentation)	10	8	0.8	0.6	CR
5	Time allocation for different activities	10	5	0.5	0.0	CNR
6	Clarity of instruction	10	7	0.7	0.4	CNR
7	Well organization of evaluation rubric	10	9	0.9	0.8	CR
8	Grammatical usage	10	7	0.7	0.4	CNR
9	Adequate assignment of the teacher role	10	8	0.8	0.6	CR
10	Students role/activities appropriate for the level of trainee	10	6	0.6	0.2	CNR
		10		**S-CVI =0.70**		**CNR**

Key:
NE: Number of Experts; EC: Experts Consensus; I-CVI: Item Content Validity Index; CVRi: Content Validity Index; CR: Consensus Reached; CNR: Consensus Not Reached; S-CVI: Scale Content Validity Index

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Table 7 presents the CVRi, I-CVI, and S-CVI of the Second Round Delphi General Aspect of the Developed Pedagogical Capacity Training Module. The analysis shows that consensus was attained for only three items (4, 7, and 9) with a CVRi of greater than 0.5 and S-CVI of 0.70, while the CVRi for the remaining items falls below 0.5. Therefore, the general aspect of the module is not appropriate and shall be reviewed again.

Third Round Delphi: Assessing the General Outlook Module

Feedback from Second-Round responses is provided to the selected expert, and the third round Delphi, based on second round responses, comments, and suggestions, is constructed and distributed to the experts. In the third round, each expert received a third-round instrument with the summary of their ratings CVR from round two. Experts were asked to reevaluate their opinions in this round when they differed significantly from the other experts. The reports are presented in Table 8.

Table 8: CVRi, I-CVI, and S-CVI of Third Round Delphi General Aspect of the Developed Pedagogical Capacity Training Module

S/N	Items	NE	EC (3&4)	I-CVI	CVR_i	Decision
1	Arrangement of instructional materials	10	8	0.8	0.6	CR
2	Logical arrangement of pedagogical phases	10	9	0.9	0.8	CR
3	Possibility for attaining the objectives of the module	10	10	1.0	1.0	CR
4	Activities (design-based task presentation)	10	8	0.8	0.6	CR
5	Time allocation for different activities	10	9	0.9	0.8	CR
6	Clarity of instruction	10	8	0.8	0.6	CR
7	Well-organized evaluation rubric	10	10	1.0	1.0	CR
8	Grammatical usage	10	9	0.9	0.8	CR
9	Adequate assignment of the teacher role	10	10	10	1.0	CR
10	Student's role/activities are appropriate for the level of trainee	10	9	0.9	0.8	CR
		10		**S-CVI =0.90**		**CR**

Key:
NE: Number of Experts; EC: Experts Consensus; I-CVI: Item Content Validity Index; CVRi: Content Validity Index; CR: Consensus Reached; CNR: Consensus Not Reached; S-CVI: Scale Content Validity Index

Table 8 presents the CVRi, I-CVI, and S-CVI of the Third Round Delphi General Aspect of the Developed Pedagogical Capacity Training Module. The analysis shows that consensus was attained for all ten items with a CVRi of greater than 0.5 and S-CVI of 0.90. It was therefore concluded that the general outlook of the module is appropriate and can be used for the training.

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Discussion of Findings

This study aimed to develop a Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation. The modified Delphi process outlined by Stewart and Shamdasami (1980) was adopted and used in the study. The findings show that the expert's consensus was attained and the module has good content validity. This concurs with Yaki *et al.,* (2020), and Retnawati (2015), who reported that the content validity index of 0.70 for developed instructional material is considered high.

The findings also indicate that all the phases, elements, and items for module validation have CVRi of greater than 0.5 and therefore are very appropriate, ensuring the attainment of experts' consensus. It was confirmed from the computation that all the phases, elements, and items for module validation have an I-CVI of > 0.70 which confirmed that phases, elements, and items used in developing the module have clear and high content validity as recommended by Shrotryia and Dhanda (2019), therefore, consensus is reached. However, the Scale Content Validity Index (S-CVI) for phases, elements, and items for module validation was found to be 0.81, 0.89 and 0.90, respectively, which aligned with acceptable values as recommended by Polit and Beck (2006).

Conclusion

This study successfully developed a Pedagogical Capacity Training Module to enhance lecturers' skills for effective curriculum implementation using the modified Delphi process by Stewart and Shamdasani (1980). The six instructional phases of the module are analysis of real-world issues, generate idea, developing and selecting the best solution, designing and construction of prototype, optimizing the solutions and communication and reflection while the twelve features include open-ended problem, real world scenario, hands-on and minds-on activities, inquiry, experimentation, teacher as facilitator, collaboration, prototyping communication, authentic assessment and technology integration. It was also concluded that the general outlook of the module is appropriate and can be used for the training. These outcomes confirm that the developed training module is both valid and appropriate for its intended purpose, offering a strong foundation for enhancing lecturers' pedagogical capacity in curriculum implementation.

Recommendations

Given the findings of this study, it is recommended that:

1. The developed Pedagogical Capacity Training Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation should be implemented with University and Colleges of Education lecturers.

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2. Lecturers should be encouraged to develop a Pedagogical Module for Enhancing Lecturers' Skills for Effective Curriculum Implementation for teaching and learning in an integrated manner.
3. Lecturers should be encouraged to implement the Pedagogical Module in their classroom instruction.

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