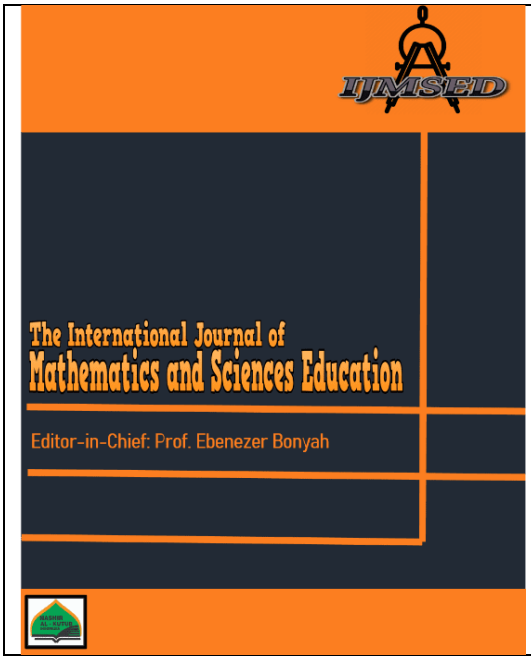
The International Journal of Mathematics and Sciences Education
Publication details, including instructions for authors and subscription information:
https://nakiscience.com/index.php/IJMSEd



Reframing multifaceted roles of teachers through developing educational research method design: design-based classroom action research

Audi Yundayani[a*], Fiki Alghadari[b]
[a*]STKIP Kusuma Negara, DKI Jakarta, Indonesia,
audi_yundayani@stkipkusumanegara.ac.id
[b]Universitas Jambi, Jambi, Indonesia,
fikialghadari@unja.ac.id

To cite this article:
Yundayani, A & Fiki Alghadari, F. (2024). Reframing multifaceted roles of teachers through developing educational research method design: design-based classroom action research. *International Journal of Mathematics and Sciences Education*, *2*(2), 60-81.
To link to this article:
https://nakiscience.com/index.php/IJMSEd
Published by:
Nasir Al-Kutub Indonesia
Residential Street Kila Rengganis, Block I, Number 11, Labuapi, Indonesia, 83361

International Journal of Mathematics and Sciences Education
Volume 2, Number 2, pp. 60-81
https://nakiscience.com/index.php/IJMSEd

Reframing multifaceted roles of teachers through developing educational research method design: design-based classroom action research

Audi Yundayani[a*], Fiki Alghadari[b]
[a*]STKIP Kusuma Negara, Jakarta, Indonesia, audi_yundayani@stkipkusumanegara.ac.id
[b]Universitas Jambi, Jambi, Indonesia, fikialghadari@unja.ac.id

*Correspondence: audi_yundayani@stkipkusumanegara.ac.id

Abstract
The central concern in educational research was determining which model of a teacher's multiple roles was preferable. In the general debate on this issue, precise positions were frequently adopted. The research examined this central question and the various stances taken within the field of education. Furthermore, the study aimed to develop the design-based classroom action research as an educational research method design. Researchers synthesized qualitative research to interpret the multiple roles of teachers, which were strongly linked to their professionalism through the development of DCAR. This qualitative study gathered data through (1) focus group discussions (FGD) and (2) expert judgment. The application of the ADDIE development model—comprising analysis, design, development, implementation, and evaluation—was initiated, but the process ended during the development phase with the inclusion of an expert design evaluation. The findings from the needs analysis indicated that teacher professional development programs should focus on (1) enhancing teaching skills and knowledge, (2) improving the teacher's ability as a course designer, and (3) nurturing research skills. In response, researchers introduced DCAR as a research method design that combined the roles of course designer and classroom action researcher. Additionally, expert judgment recommended DCAR as an alternative research method design suitable for educational research. These findings highlighted the expansion of the teacher professional development model as a tool for creating a comprehensive profile of a professional teacher.

Article History
Received:
14 November 2024
Revised:
1 December 2024
Accepted:
30 December 2024
Published Online:
31 December 2024

Keywords:
Educational Research Method Design; Design-based Classroom Action Research

1. Introduction

The Indonesian educational system evolves and actively pursues substantial and beneficial improvements. TPD, or teacher professional development, is one of the most critical contributors to educational reform. It is a growing and demanding field because teachers are the most influential change agents in the educational reform movement. Since it has ushered in rapid change, which is so encouraging for the future of education, it is a process that extends throughout teachers' professions as an opportunity for growth. Moreover, TPD encourages teachers' growth, exploration, learning, and development, thereby promoting the teaching profession. Due to the increasing complexity and diversity of the environments in which teachers operate, the requirements for their professional growth are highly variable and continually evolving (Livingston, 2017; Trent, 2020). These learning needs may be particular to teachers or their working environment, necessitating tailored professional development opportunities and teacher educators with a wide range of knowledge, skills, and competence to aid and challenge teachers throughout their careers.

Teachers must increase their knowledge and comprehension of the learning process to facilitate the growth of their students. TPD enables the goal by creating competent teachers. It is a complex process that requires teachers' cognitive and emotional engagement on an individual and group level, the ability and willingness to investigate each teacher's beliefs, and the consideration and

implementation of appropriate improvement options (Beatrice Avalos, 2011). In addition, teachers' and students' objectives and needs should be considered when selecting proper development tools. It entails participation in the development of curricula, discussion of assessment data, and the exchange of teaching methods. Being an excellent teacher is a lengthy process that requires not only the result of complex and practical skills but also the acquisition of knowledge, values, and attitudes that reflect knowing what, knowing how, knowing why, and knowing when (Calderhead & Shorrock, 2004).

Preliminary research indicates that the majority of student teachers must recognize that their responsibility extends beyond mere teaching; they must also possess the ability to design the learning process, which entails ongoing reflection. Teaching activities actively connect the concept's theoretical basis to its actual use in the classroom and beyond. As a result of critical reflection in the classroom, an opportunity arises to examine how well the teaching process fits the requirements of satisfying students' needs and attaining their learning objectives. Teaching and research have been considered mutually complementary endeavors since teachers must manage multiple tasks (Lapoule & Lynch, 2018). However, more research is required to determine whether a teacher should also be a designer and researcher. In addition, the researchers believe that there should be a concept that incorporates the teaching, designing, and research principles as an integral part of the teacher's role in order to assist the continuous improvement of the teaching process.

Researchers are keen on merging design-based research (DBR) and classroom-action research (CAR) methodologies. The concept of DBR examines the design, implementation and study of product or process in educational setting (Parsons & Hjalmarson, 2017). Further, CAR is a collective self-reflective examination conducted by participants in social circumstances to improve the rationality and fairness of their own social or educational practices, as well as their understanding of these practices and the contexts in which they are carried out (Kemmis, 2009; Kemmis et al., 2014; Kemmis & McTaggart, 1988). This is done to improve social or educational processes by identifying and resolving the students' actual problems in the classroom.

The researchers propose integrating DBR and CAR as a new model that merges the designer and researcher roles of the teacher. It is significant given that the early investigation revealed several learning process phenomena. For example, the majority of teachers prefer textbook-based teaching. Most teachers also have not prepared lesson plans with the needs and profiles of their students in mind, including the learning components of instructional material, teaching process, media, and assessment. In addition, they did not create a lesson plan as a teaching scenario since they viewed the lesson plan as an administrative issue. The discrepancy between the government's demand and teachers' curriculum knowledge indicates that teachers continue to lack this expertise (Saputra, 2019). It may have occurred because they did not fully comprehend the concept of the curriculum, which caused teachers to alter their teaching methodologies. These modifications, among others, can be observed in their lesson plans which should align with the curriculum, as reflected in the course outline. However, not all teachers see the importance of creating lesson plans and teaching materials. This study explores teachers' multiple roles, closely tied to the growth of teacher professionalism, by developing the design-based classroom action research (DCAR) as an educational-based research method design. In particular, three questions are addressed in this study:

a. How is the result of the need analysis of the student teachers related to educational-based research method design?
b. How is the design of design-based classroom action research (DCAR) as an educational-based research method design?
c. What are the results of the expert review of design-based classroom action research (DCAR) as an educational-based research method design?

2. Method

The research design employed a research and development (R&D) approach using the ADDIE development model, which traditionally consists of five phases: analyze, design, develop, implement, and evaluate. However, this study was limited to three stages: analyze, design, and development (Branch, 2009). The primary aim was to create a product by utilizing research methods grounded in education. To ensure the feasibility of the developed design, expert validation was conducted. The R&D method facilitated the development, refinement, and field testing of new products and procedures to

meet specific standards (Thiagarajan et al., 1974). The study's outcome was a design for an education-based research methodology that explored teacher expertise and proficiency in teaching, course development, and research.

This qualitative study also utilized focus group discussions (FGDs) to identify the needs of student teachers, which were then analyzed and interpreted to inform the design of the educational-based research method. The FGDs included twenty-three lecturers from the field of education, whose study programs and educational backgrounds are detailed in Table 1.

Table 1.
Focus Group Discussion Participants

Study Program	Educational Background	
	Master Degree	Doctoral Degree
Pancasila and Civics Education	2	4
Mathematics Education	3	2
English Education	2	3
Primary Teacher Education	2	2
Early Childhood Teacher Education	0	1
PE Teacher Education	2	0

Focus group discussion (FGD) served as a critical phase aimed at gathering comprehensive information about the product to be developed and identifying the specific requirements for the learning process. FGDs generate evidence commonly used in evaluating programs and policies and play a crucial role in various evaluative processes, including needs analysis, program theory development, and implementation and outcome evaluations (Ryan et al., 2014). As an adaptable and effective method, FGDs enhance evaluations by incorporating a social dimension into verbal data collection.

The analysis of needs in FGDs employs the concept of needs analysis, which includes three components: present situation analysis (PSA) to evaluate the strengths and weaknesses of the learning experience, target situation analysis (TSA) to examine objective, perceived, and product-oriented needs, and learning situation analysis (LSA) to address subjective, felt, and process-oriented needs (Dudley-Evans et al., 1998; Hutchinson & Waters, 1991; Rahman, 2015; Yundayani, 2018; Yundayani et al., 2017). This phase focused on uncovering potential causes of deficiencies in teacher-education students' mastery of competencies required for their future roles as educators. By clarifying these gaps and exploring possible alternatives, this stage facilitated the identification of foundational elements for the preliminary design.

Learner analysis was conducted by examining the collective and individual attributes, capabilities, and experiences of teacher-education students. The FGDs further identified the essential responsibilities that students preparing for teaching careers would encounter. Task analysis was performed to examine fundamental teacher competencies, integrating these into the design phases of education-based research methods (Thiagarajan et al., 1974). The study advanced by determining the stages of research methods and systematically compiling and utilizing these stages to develop specific competencies. Finally, the identification of indicators for the development of education-based research methods marked the culmination of the design process.

2.1. The Design Stage

The data from the need analysis through FGD was analyzed and interpreted using thematic analysis through 6-step framework, namely, Step 1: Become familiar with the data, Step 2: Generate initial codes, Step 3: Search for themes, Step 4: Review themes, Step 5: Define themes, Step 6: Write-up (Boeije, 2010; Braun & Clarke, 2006; Byrne, 2022). The results were then used as the basis to design and develop an education-based research methodology.

The required competencies of students' instructors, including their projected role as future educators, were also compiled by researchers during the design phase. Additionally, the stages of classroom action research were examined and compared to the phenomenon observed in teacher-student practices by the researchers. It revealed a void that a progression of design-based research stages can

bridge. The researchers also establish the methodology for designing the stages of the research, which consists of determining the objectives and indicators.

2.2. The Development Stage

As an evaluation of its practicability, the expert opinion endorsed the design of an education-based research methodology. This category of external reviewers possesses a specialty in the design of educational-based research. After the data has been gathered and summarized, the designer should consider specific recommendations. Clarity, impact, and feasibility constituted the three primary validation criteria (Dick et al., 2015). External reviewers provided feedback on the feasibility of the Design-based Classroom Action Research research method design through the assessment questionnaire. The evaluation uses the rating scale: 5= Very precise/very good/very clear, 4= Precise/good/clear, 3= Quite precise/quite good/quite clear, 2= Less precise/less good/less clear, and 1= Not precise/not good/not clear. In addition, opinions and suggestions regarding the Design-based Classroom Action Research were solicited from them.

Moreover, all the collected data were selected and presented by the research objective. It adopted a qualitative descriptive approach in which the primary objectives were collecting and analyzing data to elucidate the occurrence (Heigham & Croker, 2009). It is a type of research that attempts to characterize a phenomenon, occurrence, or event in the present. Moreover, the objective of the descriptive approach is to systematically discover a comprehensive explanation and description of the study object (Creswell, 2012).

The initial context of the study had to be concerning design based research, which investigated the design, implementation, and study of products or processes within an educational environment (Parsons & Hjalmarson, 2017). Second, the study had to focus on the concept of CAR, which was defined as a collective self-reflective examination conducted by social participants to improve the rationality and fairness of their own social or educational practices, as well as their understanding of these practices and the contexts in which they are carried out (Kemmis, 2009; Kemmis et al., 2014; Kemmis & McTaggart, 1988).

3. Results and Discussion

3.1. The Result of the Need Analysis of the Student Teachers Related to Educational-based Research Method Design

FGD was employed in this research undertaking to determine the perspectives of teachers in the field of education regarding the needs of students. This objective was achieved by analyzing the viewpoints of lecturers on three dimensions: the analysis of the present situation, the analysis of the target situation, and the analysis of the learning situation. The objective of the learning circumstance analysis was to ascertain the essential needs of the students in order to inform the development of an educational research method. Table 2 shows the result of the need analysis of the student teachers related to educational-based research method design.

The present situation analysis demonstrated that student teachers most frequently implemented classroom action research, a strength. This activity is designed for professional development and indicates an ongoing learning process (Ulvik, 2014). As part of their research experience, student teachers also exhibited a comprehension and enthusiasm for conducting educational-based research, defined as the amalgamation of learning experiences they accumulate throughout their careers. The positive reception and engagement with research methodologies are suggested by the enthusiasm and comprehension they exhibit when conducting educational-based research. Intrinsic motivation can affect their research outcomes (Alamri et al., 2020). The enthusiasm of student teachers is also essential, as it indicates that they are not merely engaging in research for academic purposes but are genuinely interested in enhancing and exploring their teaching practices.

Furthermore, instructional courses enabled student teachers to engage in microteaching as part of their research experience, which acquired their practical experience in a controlled environment. They can apply and refine teaching strategies by engaging in microteaching before implementing them in their classrooms. This method fosters a more dynamic and responsive teaching practice by offering a critical opportunity for immediate feedback and iterative improvement (Murphy Odo, 2023). The discussion is fundamentally centered on classroom action research, which entails a methodical examination of

classroom phenomena, allowing student teachers to reflect on and investigate their teaching practices in their natural classroom environment (Mertler, 2019). The classroom action research process also provided student teachers with an authentic opportunity to implement course-based strategies by reflecting on their practice and a model they developed to investigate a phenomenon transpiring in the natural environment of their classroom (L. Black, 2021). Student teachers can refine their instructional strategies and generate actionable insights by developing models to investigate specific phenomena in their teaching contexts based on empirical evidence.

Additionally, action research was an information-gathering process intended to encourage and generate new insights, reflective practice, and facilitate constructive transformations, which also functions as an information-gathering process to improve reflective practice is noteworthy (Mertler, 2019; Morales et al., 2016). Furthermore, the reflective practices of student teachers were multifaceted due to engaging in self-study and inquiry to evaluate their teaching practice for further examination. It underscores the iterative nature of research in teaching, which leads to constructive transformations and the generation of new insights through continuous reflection (Watkins et al., 2016), which facilitates sustained professional development and enables student teachers to adapt and modify their teaching approaches in response to observed successes and challenges.

Integrating educational-based research and reflective practices into teacher education programs offers substantial benefits since it cultivates a culture of perpetual improvement (Liu, 2022), encourages student teachers to engage with their teaching practice deeply (Gentry et al., 2016), and contributes to the broader educational discourse (Alzahrani et al., 2022). Further, microteaching activity, action research, and collaborative dissemination underscore the significance of practical, reflective, and evidence-based approaches in developing influential teaching professionals (Saribas & Ceyhan, 2015). However, the present situation analysis revealed the student teachers' challenges, such as their need for support in executing research designs anchored in the teaching process, which impacts additional exposure to research methodologies that may be necessary during their education (Matos et al., 2023). This requirement for additional exposure may lead to difficulties in applying and understanding various research designs.

A gap may also result from a mismatch between theoretical knowledge and practical application. Transitioning the teaching knowledge into practice necessitates additional support and guidance, regardless of whether student teachers are acquainted with research concepts. They also encountered a fallacy in developing lesson plans by exclusively focusing on teaching practice since it is a fundamental component of effective instruction, which encompasses the development of educational objectives, the selection of pertinent content, the development of instructional activities, and the evaluation of student learning (John, 2006). A well-crafted lesson plan is a roadmap that directs teachers through the teaching process, facilitating and guaranteeing that learning objectives are achieved and that teaching methods are coherent and follow the students' needs (Skowron, 2001). They must be informed about the diverse responsibilities inherent in the teaching profession. They must be acquainted with the teaching process stages that could be incorporated into an educational-based research methodology. The comprehension of student teachers regarding integrating the learning design process with teaching practice could have been enhanced.

A lesson plan design that considers the learning goals, the student's needs, their backgrounds, characteristics, and learning preferences, as determined by the target situation analysis, must be incorporated by student teachers to implement an educational-based research method successfully. The necessity for them to develop a comprehensive lesson plan design that integrates educational-based research methodologies is emphasized (Barari et al., 2022) to meet students' diverse needs, backgrounds, characteristics, and preferences and achieve learning goals (Daniel, 2023). It underscores the importance of allowing student teachers to manage various responsibilities effectively, a critical skill for their future teaching careers.

A research method design with an educational foundation is essential to demonstrate the teacher's multifaceted roles as a learning designer and researcher. Providing student teachers with a strong foundation in educational-based research methods should be strengthened (Li, 2014) since it is essential for their future professions, as they are required to manage a wide range of responsibilities. To effectively fulfill these responsibilities, they must be proficient in integrating research methods into their practice, facilitating their growth as both learning designers and researchers (Edelson, 2002). It reflects

the potential of educational-based research methodologies to satisfy these requirements and emphasizes the implications for teacher education programs.

The learning situation analysis has revealed that student teachers require teaching materials that are both comprehensive and current in order to fulfill their multifaceted responsibilities as teachers effectively. Additionally, they must acquire reflective teaching experience and supported teaching practice, as well as become integrated with instructional design expertise, which emphasizes the necessity of reflective teaching experience (Harford & MacRuairc, 2008), the importance of up-to-date and comprehensive instructional materials (Smith & Tyler, 2011), and the necessity of solid instructional design expertise (Ritzhaupt & Kumar, 2015). These areas are essential for preparing student teachers to meet the diverse demands of their future responsibilities. They should be further investigated, and their implications for teacher preparation programs should be considered.

Student teachers also require mentoring programs to conduct research by focusing on the education field. Throughout the learning phase, they are obligated to participate in many micro-teaching experiences, which emphasizes the necessity of two critical components for the adequate preparation of student teachers involved in educational research: the provision of numerous micro-teaching experiences (Arslan, 2021) and the implementation of mentoring programs (Parker et al., 2021). These components are instrumental in developing the competencies necessary for successful teaching and research. Furthermore, student teachers must be capable of effectively engaging in reflective instructional practice. Consequently, they must possess instructional design expertise, educational research acumen, and instructing proficiency (Mandal, 2018). The research results underscore the urgent necessity for student teachers to effectively engage in reflective instructional practice by securing three core competencies: teaching proficiency, instructional design expertise, and educational research acumen, which are interconnected.

3.2. Design-Based Classroom Action Research (DCAR) as an Educational-Based Research Method Design

Through the result of need analysis from focus group discussion, the researchers proposed a concept of design-based classroom action research (DCAR) as a new paradigm which facilitates the teachers in performing their tasks. This novel concept in integrating the principles of design-based research (DBR) as a method for developing context-sensitive new theories and educational methods (Gerholz & Wagner, 2022; Huang et al., 2019; Reeves, 2006) with the principles of Classroom Action Research (CAR) as a practice, including sayings, doing, and relating (Kemmis, 2009; Kemmis et al., 2014). Design-based classroom action research (DCAR) is illustrated in Figure 1. Moreover, Figure 1 demonstrates the notion of design-based classroom action research (DCAR).

Figure 1.

Design-based Classroom Action Research Model

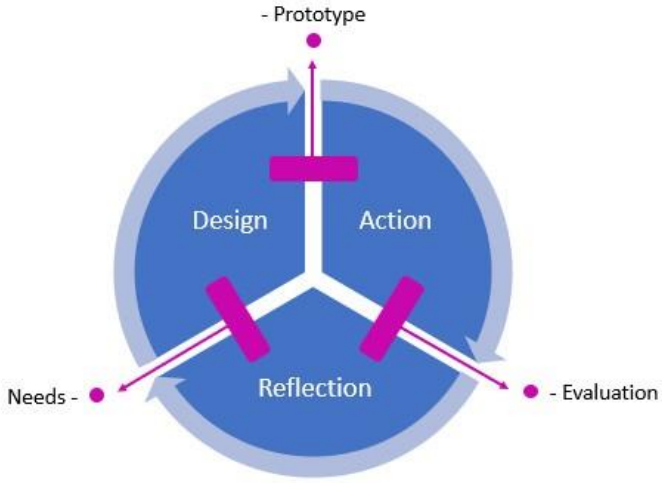
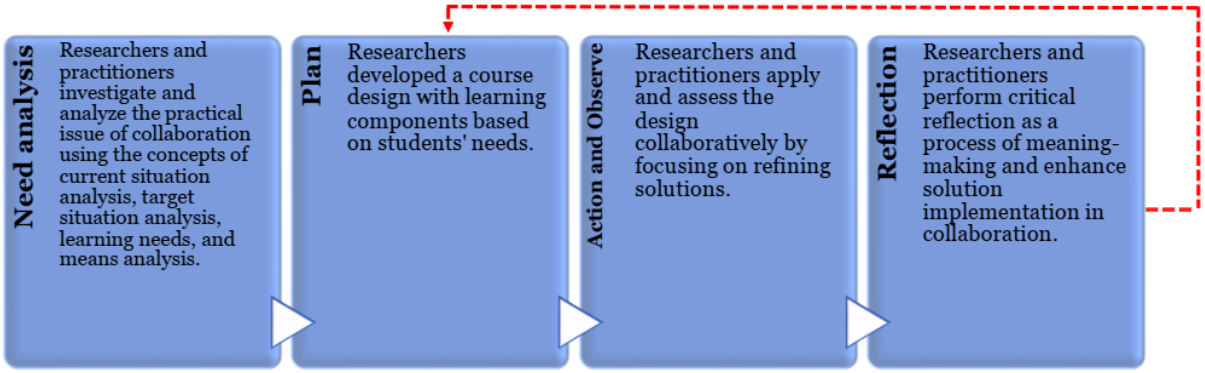


Figure 2.
Design-based Classroom Action Research



3.2.1. Need analysis

Need analysis is the initial phase of design-based classroom action research. As the process of diagnosing and assessing, it seeks to identify the problem. In addition, it often refers to the activities involved in gathering information that will serve as the foundation for designing a curriculum that meets the needs of a particular set of students (Hutchinson & Waters, 1991; Munby, 1978; Nicholls & Nicholls, 2018). Moreover, needs analysis is the cornerstone of course design, and a badly launched needs analysis will have a detrimental impact on the other processes of course design, including material selection, creation, instruction, and assessment (Assassi, 2020). In this phase, researchers and practitioners study and analyze the practical issue of collaboration by employing the ideas of current situation analysis (CSA), target situation analysis (TSA), learning needs analysis (LNA), and means analysis (MA).

Current situation analysis considered to be the umbrella that embraces students' lacks in competency or proficiencies. CSA encompasses numerous factors, including students' goals and backgrounds, their prior knowledge and experiences, as well as their profile, characteristics (Long & Fan, 2022; Tiwari et al., 2021; Yundayani, 2018). Needs will include what students know, don't know, and wish to know, and they can be collected and analyzed in a number of methods. It can be delivered through the observation to the students in the learning process or through document analysis, for instance through the previous learning result, which informs the students' prior knowledge or competency. If it is possible, we can do a diagnosing test to detect the students' needs.

The purpose of a target situation analysis is to determine what students will be expected to do in the target situation and how they can acquire the target competency most effectively throughout this period of learning. An analysis of the goal scenario is constituted by a concentration on the outcomes. It is a description of the features of required competency in terms of settings, themes, functions, and forms, allowing for the determination of long-term educational goals (Javid et al., 2020; Purpura & Graziano-King, 2004; Torregrosa Benavent & Sánchez-Reyes, 2015). Target situation analysis includes necessities, which define what the student must know to function well in the target situation, lacks, which indicate the gap between target and existing competency of the student, and wishes, which give the student's perspective on their needs. Moreover, TSA aims to assess the students' contexts that require the objective. It also determines the students' expectations to do outside the classroom in light of the aim.

Learning needs analysis aims to identify effective learning strategies and subjective, felt, and process-oriented needs. It also influences what students wish to study and the most effective learning strategies. it provides information to tailor teaching curricula to the needs of students (Hadley et al., 2007; Xiao, 2006). The overall aims and objectives of existing teaching courses need to be adapted to student's profiles that suggest a particular learning need. Further, it is also an umbrella term for all elements associated with the learning process, such as motivation, awareness, personality, learning styles and strategies, social context, Etc. The learning requirements are classified into attitude, motivation, learning styles, perceived challenges, and strategies (Xiao, 2006). For further clarification

of these elements, an effort will be made to examine the students' preferences for learning classroom activities, their attitudes toward student-centered and teacher-centered approaches, authority in class, culture learning in learning programs, their motivation, and the most significant challenges they encountered while learning and implementing learning strategies.

In addition to the CSA, TSA, and LNA, conducting a means analysis is also advisable. It seeks to determine the required learning situation and learning components. In addition, the outcome provides information about the functional environment of the course (Saragih, 2014). Moreover it looks at the environment in which a course will be run: what is available in terms of equipment, facilities, time and materials, and what is not (Romanowski, 2017).

The concept of need analysis is derived from the English specific purposes principles and learning design; however, the researchers noticed that the same objective was presented throughout the stages of need analysis and the results as a source for identifying the problem statement, research background, and research question and review. It is a corner stone how we commence our roles as teachers, designers, and researchers. Since the principles and objectives are comparable, the researchers claim that the method for analyzing the needs of students is customizable.

3.2.2. Plan

The second stage is a plan. Based on the result of the need analysis, we plan a course design, including its components. The lesson plan can be constructed by considering the concept of the ABCD model, which covers (1) determining who will achieve the objective, which is the Audience and their prior knowledge; (2) What is the desired change in Behavior? We can use action verbs (Bloom's taxonomy) to write observable and measurable Behavior that shows mastery of the objective; (3) What the Conditions under which the objectives must be completed. If any, state the condition under which Behavior is to be performed, and it is optional; (4) What Degree or standard must the students meet to reach acceptable performance? If possible, state the criterion for acceptable performance, speed, accuracy, quality, Etc., and it is also optional (Kurt, 2019). Teaching scenario design as the lesson plan, including developing necessary learning components.

In this stage, the teacher starts by developing the learning indicators as a measure to observe progress in the development of capacities that provide a simple and reliable means to measure achievements, reflect changes linked to an intervention, or help evaluate results. Teachers can use learning indicators as evidence to assess and analyze the level to which a student demonstrates engagement and development in their learning environment. Moreover, learning indicators can also provide helpful information into a teacher's impact on students' learning, accomplishments, and well-being when utilized to evaluate teaching practices (*Indicators of Learning*, 2012). They also provide useful insights on teaching success, such as the quality and effectiveness of teaching approaches, the delivery of content, and the capacity to respond to students' needs and effectively engage them.

The Bloom taxonomy of educational objectives is highlighted as a pedagogical tool that can assist teachers of personality assessment in developing effective and student-centered instructional design. It provides a progression of educational objectives for lesson planning, needs assessment, and measuring learning outcomes (Anderson & Krathwohl, 2001; Domain & 1956, n.d.; Krathwohl, 2010). The taxonomy consists of six categories of aims, organized hierarchically from the most basic to the most advanced. Knowledge, comprehension, application, analysis, synthesis, and evaluation are the levels.

The instructional material should also be created based on the findings of the initial need analysis. Material development refers to the production, evaluation, and adaptation of instructional materials by teachers. Additionally, when developing or writing instructional materials, we should evaluate how students learn (Tomlinson, 2010). Moreover, the development of teaching materials is guided by the following principles: (1) flexibility; (2) from the text to language; (3) engaging content; (4) natural language; (5) analytic approaches; (6) an emphasis on review; (7) personalized practice; (8) integrated skills; (9) a balance of approaches;(10) student development; (11) professional respect (Bell & Gower, 2011). Obviously, these concepts can be modified according to the learning objective and the students' needs.

Teaching procedure can be thought of as a predetermined series of stages to be followed throughout the learning process. It tends to be teaching methodology which can be through teaching model, approach, method, strategies, or techniques. The teaching method is a homogeneous system of

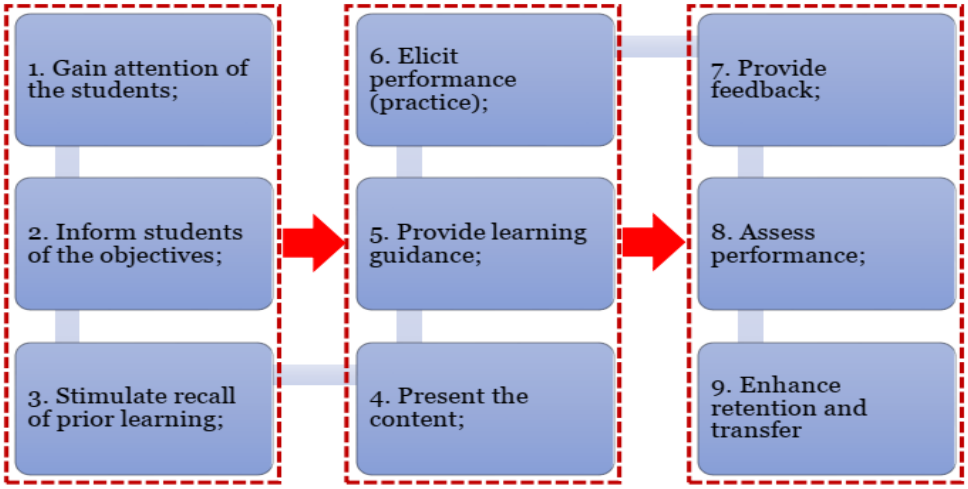
procedures, actions, and operations structured in a group of well-correlated activities based on several variables (Ciobanu, 2018). Establishing guidelines for students' conduct during the learning process is a vital aspect of classroom management. There is a common set of preparation principles that includes an opening statement or activity as a warm-up for a variety of lessons. It is also a set of activities and procedures for which sufficient time has been allotted for whole-class work, small-group and pair work, teacher discussion, student discussion, and closing. Innovative teaching methods are any techniques that do not compromise the fundamental educational goal (Subramani & Iyappan, 2018). However, the acquisition of information and knowledge by the students should be seen as the primary purpose of education.

The assessment is the most potent instrument for confirming that students have attained the learning objective. It is designed to demonstrate student achievement. Formative assessment is a spectrum of formal and informal assessment procedures undertaken by teachers during the learning process to modify teaching and learning activities to improve student achievement by focusing on the specifics of content and performance. In addition, the summative assessment focuses on the outcome of the learning program to evaluate students' learning, abilities, acquisition, and academic accomplishment after a specific instructional period, often at the program's finish. They should incorporate cognitive, emotional, and psychomotor evaluations as a result of an educational program. Moreover, it is the information from students' position on their learning journey to achieve the learning goal. It also describes how much they are ahead or behind their mate and to what extent the behavior changes are acceptable (Bhat, 2019; Panchal, 2020). Further, formative and summative evaluation describes how far the students can apply their present acquired knowledge to their future learning situations, at what point they are facing any difficulty, and many more.

3.2.3. Action and Observe

The idea of teaching theory can be viewed as an integrated set of learning theory-based concepts that predicts the effects of various instructional situations on a student's cognitive processing and the consequently acquired skills. A nine-step procedure is the events of instruction, which correlate to and address the learning conditions depicted in Figure 3 (Gagné, 1977). The first stage in grabbing students' attention is activating their receptors with stimuli. In addition, the stage of the learning objectives information seeks to establish a degree of learning expectations. The third stage of boosting recall of prior knowledge tries to retrieve and activate short-term memory. In addition, the fourth stage presents the content as the selective perception of content. The fifth stage provides learning guidance as the semantic encoding for storing long-term memory. The sixth stage of the instructional event describes eliciting performance or practice as a response to questions to enhance encoding and verification. Moreover, the seventh stage is providing feedback as reinforcement and assessment of correct performance. The eighth stage assesses performance through retrieval and reinforcement of content as the final evaluation. The ninth stage is enhancing retention and transfer to the job as retrieval and generalization of learned skills to the new situation (Ali & Ali, 2015; Ngussa, 2014).

Figure 3.
Gagné's Nine Events of Instruction (Gagné, 1977)



Attracting students to course material should be the first step in the teaching process, as learning cannot occur until students are guided toward new information. In addition, students must receive information regarding the learning objectives. They are aware of course objectives, are eager to learn, and are warier of stimuli related to course aims. Before presenting new information and expertise, the teacher should remind students' prior understanding of the topic. Students are provided with guidance on acquiring and retaining knowledge to engage in meaningful coding and showcase their knowledge by displaying their performance. In the subsequent stage, feedback offers students information regarding their performance, enabling them to comprehend their knowledge and remedy their errors. The student's performance is then explicitly evaluated via unit or chapter tests, projects, portfolios, skill demonstrations, Etc., depending on the topic's knowledge, skill, or attitude content. As the final step, numerous activities are done to improve retention and transfer; such activities may also be incorporated into the preceding (Çetin & Solmaz, 2020; Khadjooi et al., 2011; Weyers, 2006).

Observation of the classroom during the learning process is also anticipated to be a vital component of education since it enables students to maximize their classroom experience, hence boosting their academic success and the school's overall performance. Observation in the classroom is considered a vital aspect of teacher professional development, as any effort to improve the preparation of teachers and the quality of instruction, must focus on the teaching and learning processes occurring in the classroom (Lasagabaster & Sierra, 2011; Merç, 2015). Given that observation may be an effective method for boosting the learning process, the attitudes and beliefs of teachers regarding observation are both valuable and essential. Considering that observation can be a beneficial strategy for enhancing the teaching process. The learning process should assist teachers in understanding how instructional approaches are implemented, how teaching spaces are organized, and how students react to the atmosphere in the classroom. They can better serve as a bridge between the theoretical and practical aspects of the educational contexts due to classroom observation (Reed & Bergemann, 2001). It allows teachers to collect information about their teaching and classroom practice, which encourages them to examine the learning environment in the classroom more carefully.

3.2.4. Reflection

Reflection is an essential component of the educational process as a response to the professionalism of teachers. Since comprehending a descriptive, analytical, and critical educational experience requires logical reasoning, teachers can broaden and deepen their instruction through reflective teaching by continually examining their teaching practices. Such examinations assist individuals in revealing implicit ideas and weighing the ramifications of various activities, especially in the teaching context. Teachers apply the critical reflection through answering self-questioning, (1) what I do; (2) what this means; (3) how I came to be like this; (4) how I might do things differently. This self-questioning asks the teacher to describe, to inform, to confront, and to construct (Alsuhaibani, 2019). Teachers can bridge

the gap between their ideas and classroom practices through reflection, enabling them to behave analytically instead of in reactive feedback.

The development of teaching competence and the professional development of teachers require professional growth in the form of the formation of new ideas and the modification of existing concepts that have been shaping behavior through the process of reflection. Reflective practice is an intentional act of critical thinking and reflection over learning and teaching to get insightful views and enhance future experiences (Bawaneh et al., 2020). It asserts that teachers who actively engage in reflective practices can have a deeper understanding of their teaching, analyze their professional development, build skills for making informed decisions, and become proactive and confident in their teaching practice.

The stages of design-based classroom action research empower the teacher as a learning designer and a researcher as a commitment to continual improvement by concentrating on the needs, preferences, and background of students. The steps of the DCAR idea were outlined in Table 3. The study's findings presented design-based research (DBR) and classroom-action research (CAR) merging into design-based classroom-action research (DCAR). It is a tool for the continuous improvement of the educational system, which is achieved by examining the system through multiple lenses that seek engaging linkages between theory, practice, and experience. The DCAR method encourages teachers to bridge the gap between teaching practice, design, and research by establishing mutually beneficial connections between the three.

3.3. The Results of the Expert Review of Design-Based Classroom Action Research (DCAR) as an Educational-based Research Method Design

Tabel 4. *Feedback is documented*

Expert #1:	"Design-based Classroom Action Research (DCAR) possesses a lucid syntax, exhibits a comprehensive appearance, and emphasizes attaining a profound comprehension of the learning process. A firm foundation is established during the needs analysis phase for developing lessons that effectively address the students' needs. It grants lesson planning a structured and all-encompassing framework. Every element of the design contributes to the direction and concentration of lesson planning. Nevertheless, presenting the phases in the planning section as statements rather than questions is preferable."
Expert #2:	"The phases of the research method design fulfilled the criteria for DCAR research; however, they needed more thorough explanations and illustrative examples to aid students. Furthermore, it is recommended that the ultimate design be intricately connected to the need analysis phase."
Expert #3:	"A need analysis is necessary to determine which learning materials, media, assessment, and learning are essential for students to effectively and appropriately attain learning objectives in accordance with their academic standing. In light of the diverse range of students' needs, it would be more advantageous if this research provided a more precise delineation of the specific needs to be investigated and assessed."
Expert #4:	"The research method's design is highly intriguing. It offers advancements in the field of Classroom Action Research, suggesting that it be adopted by teachers at all levels, including student teachers."
Expert #5:	"The researchers must specify whether the resulting DCAR design constitutes a classroom action research method or a learning model or design. Additionally, for the benefit of future users, it is recommended that the stages of DCAR in each component be elucidated, particularly in the needs analysis phase, which ought to commence with a diagnostic test. Initiate the learning implementation phase with pre-, main, and post-activities. Focus should then be placed on the learning components that remain to be completed at the reflection stage."
(Suggestion transcript, Respondent # 01, # 02, and # 03, translated by the author)	

The need analysis resulted in the development of a model of educational research method design that reflects a conception of teachers' multiple roles in contributing to teacher professional development through DCAR. Through the assessment questionnaire, the external reviewers provided an evaluation of the design's feasibility, with an emphasis on clarity, impact, and feasibility (Dick et al., 2015). This feedback is documented in Table 4.

Excerpt 1 provides recommendations from external reviewers who have assessed the DCAR model. As per the initial external reviewer, DCAR is characterized by a comprehensive appearance, a lucid syntax, and a focus on achieving a fundamental understanding of the learning process. The instruction plan is integrated with teaching practice in DCAR, which serves as a model for designing educational research methods. This allows the teacher to be proficient in various roles, such as that of a learning designer and researcher, as DCAR involves a cycle of lesson design, action, and reflection. The cycle commences with a needs analysis phase, essential for developing lessons that effectively address the student's needs. It provides a comprehensive and structured approach to lesson planning (Doğ, 2023; Magliaro & Sambaugh, 1999). Every component of the design contributes to the direction and focus of lesson planning. Despite this, the initial external reviewer recommended that the phases in the planning section be presented as statements rather than queries.

Additionally, the research method design phases met the criteria for D-CAR research; however, the second external reviewer believed that the model required more comprehensive explanations and illustrative examples to assist students. Additionally, she advised that the final design be closely linked to the need analysis phase. It is crucial because the outcome of the need analysis serves as the basis for the lesson's design, which encompasses all aspects of the learning process, including the development of material and evaluation. It also determines the pedagogical principle that should be implemented. Furthermore, how teachers' lesson arrangements should align with the learning requirements of their students (Chizhik & Chizhik, 2018; Ndihokubwayo et al., 2022). In addition, a need analysis is required to ascertain which learning materials, media, assessment, and learning are essential for students to effectively and appropriately achieve their learning objectives following their academic status.

The third external reviewer contended that this model would be more advantageous if it provided a more precise delineation of the specific needs to be investigated and assessed, given the diverse range of student requirements. Nevertheless, the researchers contended that the model could accommodate students' learning preferences, characteristics, needs, and deficiencies by conducting a need analysis. In addition, the teacher is the primary actor in developing an appropriate teaching scenario and facilitating students' attainment of the established learning objectives in their capacity as a course designer (Herrington & Oliver, 2000). Course design also incorporates student uniqueness as a critical component (Rogers, 2021).

According to the fourth external reviewer, the research method's design is highly intriguing. It suggests that teachers at all levels, including student teachers, should implement it, as it provides advancements in Classroom Action Research. Classroom Action Research is valuable due to its specific methodological requirements, which include the empowerment of the target group, active participation, rich pre-analysis, focused technological design, embodied interaction, and the potential for emerging goals (Majgaard et al., 2011). Consequently, an iterative approach to design and change is adopted. Additionally, it offers a novel perspective on the subject matter. In this instance, DCAR offers a novel perspective on the learning processes interconnected with learning design and reflection as a cycle that enables the development of educational-based research designs.

The fifth external reviewer recommended that the researchers clarify whether the resulting D-CAR design is a classroom action research method, a learning paradigm, or a design. At this juncture, researchers asserted that the DCAR concept incorporates the principles of Classroom Action Research (Kemmis, 2009; Kemmis et al., 2014; Kemmis & McTaggart, 1988) and Design-based Research (Gerholz & Wagner, 2022; Huang et al., 2019; Majgaard et al., 2011). This also aligns with the concept of need analysis (Dudley-Evans et al., 1998; Hutchinson & Waters, 1991), the ABCD model (Kurt, 2019), and Gagné's Nine Events of Instruction (Gagné, 1977). In practice, DCAR enables the teacher to fulfill their dual responsibilities of course design, teaching practice, and reflection by facilitating a cycle that could be characterized as an educational-based research design. Furthermore, the fifth external reviewer suggested that the stages of D-CAR in each component be clarified, particularly in the needs analysis phase, which should have commenced with a diagnostic test for the advantage of future users.

Nevertheless, the researchers thought that the need analysis stage serves the same objective as a diagnostic test: to ascertain the students' prior knowledge. It can be viewed as a present situation analysis designed to identify the students' deficiencies (Dudley-Evans et al., 1998; Hutchinson & Waters, 1991). DCAR could be implemented as an educational-based research design, enabling teachers to conduct a cycle that integrates their multiple roles. In addition, teachers' responsibilities are not limited to the practice of teaching; they should also regard their classroom as a continuous research area dedicated to enhancing the quality of teaching by concentrating on students' requirements.

4. Conclusion

The globalization of the educational system encourages teachers to maintain very high pedagogical standards to excellence in academic activities that can be reflected through some teacher's role, as being a lesson designer or researchers as the result of continuous critical reflective teaching process. The concept of DCAR collaborates the role of the teacher as both a course designer and a classroom action researcher. These findings suggest a model of educational research method design which reflects the growth of the teacher professional development model as a tool for forming a professional teacher's profile.

The researchers strongly propose that higher education institutions for teachers adopt this idea, which states that a teacher is both a designer and a researcher, and reflect it in their curriculum in a way that makes it easier for students to move back and forth between theory and practice. The novel idea of DCAR needs to be seen as a new paradigm for teachers' ongoing professional development.

Even though this study makes some significant contributions, it has a number of drawbacks, such as its limited scope and research methodology. Initially, this study's scope was limited to the idea of DCAR. The application of this DCAR concept and its effects on the teaching paradigm must be investigated. Future research is anticipated to adopt a more exploratory and critical stance toward this DCAR notion. Adopting a broader perspective of this notion is strongly recommended to make it better, more accepted, and capable of reaching a more thorough perspective.

The globalization of the educational system has urged teachers to uphold high pedagogical standards, achieving excellence in academic activities through their multifaceted roles, such as lesson designers and researchers, which stem from a continuous critical reflective teaching process. The concept of Design-Based Classroom Action Research (DCAR) integrates these roles, positioning teachers as both course designers and classroom action researchers. This dual-role approach fosters teacher professional development and offers a model for an educational research method that contributes to the creation of a professional teacher profile. In light of these findings, the researchers recommend that higher education institutions for teacher training incorporate the DCAR concept into their curriculum. This integration should aim to bridge theory and practice seamlessly, enabling future teachers to adopt dual roles effectively. DCAR should be regarded as a groundbreaking paradigm for teachers' ongoing professional development, emphasizing the importance of reflective practice and research-oriented teaching.

However, this study has certain limitations, including its restricted scope and methodological focus, which centered solely on the conceptualization of DCAR. Future research is encouraged to expand on this concept by exploring its practical application and the impacts it could have on teaching paradigms. Investigations should adopt a more exploratory and critical perspective, assessing the feasibility and adaptability of DCAR across various educational contexts. Broadening the understanding and implementation of this concept is vital to enhancing its acceptance and ensuring it becomes a comprehensive framework for teacher professional development.

Limitations

This study has several limitations that should be considered. First, the findings may not be generalizable to other educational contexts as the focus is limited to the implementation of design-based classroom action research in a specific setting with unique characteristics. Second, the limited duration of the study affects the ability to evaluate the long-term impact of the developed approach on the multifaceted roles of teachers and student learning outcomes. Third, this study emphasizes the development of research

design methods and teacher roles, leaving other aspects, such as individual student engagement or mastery of specific learning content, less thoroughly explored.

Acknowledgments
Recognize those who helped in the research, especially funding supporters of your research. Include individuals who have assisted you in your study: Advisors, Financial supporters, or may another supporter i.e., Proofreaders, Typists, and Suppliers who may have given materials.

Author Contribution
Author 1: Conceptualization, Writing - Original Draft, Editing and Visualization;
Author 2: Writing - Review & Editing, Formal analysis, and Methodology;

Conflict of Interest
The authors declare no conflict of interest.

5. References

Alamri, H., Lowell, V., Watson, W., & Watson, S. L. (2020). Using personalized learning as an instructional approach to motivate learners in online higher education: Learner self-determination and intrinsic motivation. *Journal of Research on Technology in Education*, *52*(3), 322–352. https://doi.org/10.1080/15391523.2020.1728449

Ali, S., & Ali, L. (2015). Efficacy of Gagne's Nine Events of Instructions in Improving the Performance of Undergraduate Final Year Medical Students. *Advances in Health Professions Education*, *1*(2), 65–68. http://ahpe.kmu.edu.pk/article/view/29/0

Alsuhaibani, Z. (2019). *Perceptions and Practices of EFL Pre-service Teachers about Reflective Teaching*. *10*(4), 62–73.

Alzahrani, S. M., Almalki, M. S., & Almossa, S. Y. (2022). Conceptualizing life competencies: EFL teachers' qualitative perspective. *Saudi Journal of Language Studies*, *2*(4), 189–204. https://doi.org/10.1108/sjls-05-2022-0050

Anderson, L. W., & Krathwohl, D. R. (2001). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Addison Wesley Longman, Inc.

Arslan, A. (2021). Pre-service Teachers' Journey of "Teaching" through Micro-Teaching: A Mixed Design Research. *Egitim ve Bilim*, *46*(207), 259–283. https://doi.org/10.15390/EB.2021.9406

Assassi, T. (2020). Algerian Aeronautics Professionals' Needs Taxonomy: A Target Situation Needs Analysis. *International Journal of English Linguistic*, *10*(6), 90–103.

Barari, N., RezaeiZadeh, M., Khorasani, A., & Alami, F. (2022). Designing and validating educational standards for E-teaching in virtual learning environments (VLEs), based on revised Bloom's taxonomy. *Interactive Learning Environments*, *30*(9), 1640–1652. https://doi.org/10.1080/10494820.2020.1739078

Bawaneh, A. K., Abdulrahman, I., Arabia, S., Boudjema, A., Moumene, H., Studies, S., Bin, I. A., Arabia, S., Aldalalah, O., & Arabia, S. (2020). *Gauging the Level of Reflective Teaching Practices among Science Teachers*. *13*(1), 695–712.

Beatrice Avalos. (2011). Teacher professional development in Teaching and Teacher Education over ten years. *Teaching and Teacher Education*, *27*(1), 10–20.

Bell, J., & Gower, R. (2011). Writing course materials for the world: A great compromise. In B. Tomlinson (Ed.), *Materials development in language teaching* (pp. 135–150). Cambridge University Press.

Bhat, B. A. (2019). Formative and Summative Evaluation Techniques for Improvement of Learning Process. *European Journal of Business and Social Sciences*, *7*(5), 776–785. https://ejbss.org/

Boeije, H. (2010). *Analysis in Qualitative Research*.

Branch, R. M. (2009). *Instructional Design: The ADDIE Approach*. Springer.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Byrne, D. (2022). A worked example of Braun and Clarke's approach to reflexive thematic analysis.

Quality and Quantity, *56*(3), 1391–1412. https://doi.org/10.1007/s11135-021-01182-y

Calderhead, J., & Shorrock, S. B. (2004). *Understanding teacher education: Case studies in the professional development of beginning teachers*. Routledge. https://doi.org/https://doi.org/10.4324/9780203209332

Çetin, E., & Solmaz, E. (2020). *Gamifying the 9 Events of Instruction with Different Interactive Response Systems : The Views of Social Sciences Teacher Candidates*. *8*(2), 1–15.

Chizhik, E. W., & Chizhik, A. W. (2018). Using Activity Theory to Examine How Teachers' Lesson Plans Meet Students' Learning Needs. *The Teacher Educator*, *53*(1), 67–85.

Ciobanu, N. R. (2018). Active and Participatory Teaching Methods. *European Journal of Education*, *1*(2), 69–72.

Creswell, J. W. (2012). *Educational ReASEARCH: Planning, Conducting, and Evaluting Quantitative and Qualitive Research*. Pearson.

Daniel, A. (2023). *Murray State ' s Digital Commons TEACHING STRATEGIES FOR DIVERSE LEARNING STYLES*.

Dick, W., Carey, L., & Carey, J. O. (2015). *The Systematic Design of Instruction* (8th ed.). Pearson.

Doğ, S. (2023). *A Cluster Analysis for Teachers ' Designer Role : Three Profiles with Differing Focuses on Design*. *13*, 357–378. https://doi.org/10.31704/ijocis.2023.015

Domain, B. B.-C., & 1956, U. (n.d.). Taxonomy of educational objectives: The classification of educational goals. *Ci.Nii.Ac.Jp*. Retrieved September 7, 2021, from https://ci.nii.ac.jp/naid/10025289849/

Dudley-Evans, T., St John, M. J., & Saint John, M. J. (1998). *Developments in English for specific purposes: A multi-disciplinary approach*. Cambridge University Press.

Edelson, D. C. (2002). Journal of the Learning Design Research : What We Learn When We Engage in Design. *Journal of the Learning Sciences*, *11*(1), 37–41. https://doi.org/10.1207/S15327809JLS1101

Gagné, R. M. (1977). *The Conditions of Learning*. Holt, Rinehart, & Winston.

Gentry, J., Baker, C., Lamb, H., & Pate, R. (2016). Professionalization of Teaching in America: Two Case Studies Using Educational Research Experiences to Explore the Perceptions of Pre-Service Teachers/Researchers. *Administrative Issues Journal: Education, Practice, and Research*, *6*(1). https://doi.org/10.5929/2016.6.1.2

Gerholz, K.-H., & Wagner, A. (2022). Design-Based Research – Grounding, Understanding and Empirical Illustration in the Context of Vocational Education. In *Methods for Researching Professional Learning and Development* (pp. 513–534). Springer.

Hadley, J. A., Wall, D., & Khan, K. S. (2007). Learning needs analysis to guide teaching evidence-based medicine : knowledge and beliefs amongst trainees from various specialities. *BMC Medical Education*, *7*(11), 1–6. https://doi.org/10.1186/1472-6920-7-11

Harford, J., & MacRuairc, G. (2008). Engaging student teachers in meaningful reflective practice. *Teaching and Teacher Education*, *24*(7), 1884–1892. https://doi.org/10.1016/j.tate.2008.02.010

Heigham, J., & Croker, R. A. (2009). *Qualitative Research in Applied Linguistics*. Palgrave Macmillan.

Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, *48*(3), 23–48. https://doi.org/10.1007/BF02319856

Huang, R., Spector, J. M., & Yang, J. (2019). Design-Based Research. In *Lecture Notes in Educational Technology* (pp. 179–188). Springer.

Hutchinson, T., & Waters, A. (1991). *English for Specific Purposes*. Cambridge University Press.

Indicators of learning. (2012). Australian Institute for Teaching and School Leadership. https://www.aitsl.edu.au/docs/default-source/teach-documents/growth-focused-evaluations/indicators-of-learning.pdf

Javid, M., Mohseni, A., Ameri, A., & Baradaran, A. (2020). ESP Curriculum Development through Analyzing the Needs of Border Guarding Police Cadets in Amin Police University: Target Situation Analysis. *Journal of Language and Translation*, *10*(2), 63–86.

John, P. D. (2006). Lesson planning and the student teacher: Re-thinking the dominant model. *Journal of Curriculum Studies*, *38*(4), 483–498. https://doi.org/10.1080/00220270500363620

Kemmis, S. (2009). Action research as a practice-based practice. *Educational Action Research*, *17*(3),

463–474.
Kemmis, S., & McTaggart, R. (1988). *The Action Research Planner*. Deakin University Press.
Kemmis, S., McTaggart, R., & Nixon, R. (2014). *The Action Research Planner*. Springer.
Khadjooi, K., Rostami, K., & Ishaq, S. (2011). How to use Gagne's model of instructional design in teaching psychomotor skills. *Gastroenterol Hepatol Bed Bench*, *4*(3), 116–119.
Krathwohl, D. R. (2010). A Revision of Bloom's Taxonomy: An Overview. *Https://Doi.Org/10.1207/S15430421tip4104_2*, *41*(4), 212–218. https://doi.org/10.1207/S15430421TIP4104_2
Kurt, S. (2019). *Using Bloom's Taxonomy to Write Effective Learning Objectives: The ABCD Approach*. Educational Technology. https://educationaltechnology.net/using-blooms-taxonomy-to-write-effective-learning-objectives-the-abcd-approach/
L. Black, G. (2021). Implementing Action Research in a Teacher Preparation Program: Opportunities and Limitations. *The Canadian Journal of Action Research*, *21*(2), 47–71. https://doi.org/10.33524/cjar.v21i2.480
Lapoule, P., & Lynch, R. (2018). The case study method: exploring the link between teaching and research. *Journal of Higher Education Policy and Management*, *40*(5), 485–500.
Lasagabaster, D., & Sierra, J. M. (2011). Classroom observation: desirable conditions established by teachers. *European Journal of Teacher Education*, *34*(4), 449–463.
Li, L. M. (2014). *Student Teachers' Competence in Curriculum Development: Comparison between the Czech Republic and China*. PALACKÝ UNIVERSITY IN OLOMOUC.
Liu, T. C. (2022). A Case Study of the Adaptive Learning Platform in a Taiwanese Elementary School: Precision Education from Teachers' Perspectives. *Education and Information Technologies*, *27*(5), 6295–6316. https://doi.org/10.1007/s10639-021-10851-2
Livingston, K. (2017). The complexity of learning and teaching: challenges for teacher education. *European Journal of Teacher Education*, *40*(2), 141–143. https://www.tandfonline.com/doi/full/10.1080/02619768.2017.1296535?scroll=top&needAccess=true
Long, Y., & Fan, Y. (2022). Current Situation Analysis and Countermeasure Research of Party History Study and Education of College Students in the New Era. *Proceedings of the 2021 International Conference on Social Development and Media Communication (SDMC 2021)*, 469–473.
Magliaro, S. G., & Sambaugh, R. N. (1999). Teaching Instructional Design: Reframing the Relationships Between Teachers and Designers. *Proceedings of Selected Research and Development Papers Presented at the National Convention of the Association for Educational Communications and Technology [AECT]*, 349–357. http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED436163&ERICExtSearch_SearchType_0=no&accno=ED436163
Majgaard, G., Misfeldt, M., & Nielsen, J. (2011). How design-based research and action research contribute to the development of a new design for learning. *Designs for Learning*, *4*(2), 1–17.
Mandal, S. (2018). The competencies of the Modern Teacher IJRESM_V1_I10_93. *International Journal of Resarch in Engineering, Science and Management*, *1*(10), 351–360.
Matos, J. F., Piedade, J., Freitas, A., Pedro, N., Dorotea, N., Pedro, A., & Galego, C. (2023). Teaching and Learning Research Methodologies in Education: A Systematic Literature Review. *Education Sciences*, *13*(2). https://doi.org/10.3390/educsci13020173
Merç, A. (2015). *The Potential of General Classroom Observation : Turkish EFL Teachers ' Perceptions , Sentiments , and Readiness for Action*. *3*(4), 193–205. https://doi.org/10.11114/jets.v3i4.821
Mertler, C. A. (2019). *The Wiley Handbook of Action Research in Education*. John Wiley & Sons.
Morales, M. P. E., Abulon, E. L. R., Roxas-Soriano, P., David, A. P., Hermosisima, M. V. C., & Gerundio, M. G. (2016). Examining teachers' conception of and needs on action research. *Issues in Educational Research*, *26*(3), 464–489.
Munby, J. (1978). *Communicative Syllabus Design*. Cambridge University Press.
Murphy Odo, D. (2023). Perceptions of Preservice English Teachers Regarding Peer Reaction Video Feedback on Their Microteaching. *SAGE Open*, *13*(4), 1–13. https://doi.org/10.1177/21582440231210652

Ndihokubwayo, K., Byukusenge, C., Byusa, E., Habiyaremye, H. T., Mbonyiryivuze, A., & Mukagihana, J. (2022). Lesson plan analysis protocol (LPAP): A useful tool for researchers and educational evaluators. *Heliyon*, *8*(1). https://doi.org/10.1016/j.heliyon.2022.e08730

Ngussa, B. M. (2014). Gagne's Nine Events of Instruction in Teaching-Learning Transaction: Evaluation of Teachers by High School Students in Musoma-Tanzania. *International Journal of Education and Research*, *2*(7), 189–206. https://www.researchgate.net/publication/264618116

Nicholls, A., & Nicholls, S. H. (2018). *Developing a Curriculum*. Routledge.

Panchal, A. C. (2020). Formative and Summative Evaluation: Challenges and Remedy. *International Journal of Research*, *8*(3), 1–6.

Parker, A. K., Zenkov, K., & Glaser, H. (2021). Preparing School-Based Teacher Educators: Mentor Teachers' Perceptions of Mentoring and Mentor Training. *Peabody Journal of Education*, *96*(1), 65–75. https://doi.org/10.1080/0161956X.2021.1877027

Parsons, A. W., & Hjalmarson, M. A. (2017). Study of Self: The Self as Designer in Online Teacher Education. *Studying Teacher Education*, *13*(3), 331–349.

Purpura, J. E., & Graziano-King, J. (2004). Investigating the Foreign Language Needs of Professional School Students in International Affairs: A Case Study. *Teachers College, Columbia University Working Papers in TESOL & Applied Linguistics*, *4*(1), 1–33.

Rahman, M. (2015). English for Specific Purposes (ESP): A Holistic Review. *Universal Journal of Educational Research*, *3*(1), 24–31. https://doi.org/10.13189/ujer.2015.030104

Reed, A., & Bergemann, V. E. (2001). *A guide to observation, participation, and reflection in the classroom*. MA: McGraw-Hill.

Reeves, T. (2006). Design research from a technology perspective. In J. Van den Akker, K. Gravemeijer, S. McKenney, & N. Nieveen (Eds.), *Educational Design Research* (1st ed., pp. 64–78). Routledge.

Ritzhaupt, A. D., & Kumar, S. (2015). Knowledge and Skills Needed by Instructional Designers in Higher Education. *Performance Improvement Quarterly*, *28*(3), 51–69. https://doi.org/10.1002/piq

Rogers, S. (2021). Applying UDL to Online Active Learning: Instructional Designer Perceptions. *Journal of Applied Instructional Design*, *10*(1), 1–32. https://doi.org/10.51869/101/srsg

Romanowski, Pi. (2017). Proposing a comprehensive framework for needs analysis in ESP – on the integrality of needs analysis in Business English course design. *An International Journal of Applied Linguistics*, *44*(2), 147–159. https://doi.org/10.14746/gl.2017.44.2.09

Ryan, K. E., Gandha, T., Culbertson, M. J., & Carlson, C. (2014). Focus Group Evidence: Implications for Design and Analysis. *American Journal of Evaluation*, *35*(3), 328–345. https://doi.org/10.1177/1098214013508300

Saputra, D. B. (2019). The Implementation of Curriculum 2013: English Teachers' Perceptions on Developing Lesson Plan and Teaching Materials. *Linguists: Journal of Linguistics and Language Teaching*, *5*(2), 54–67.

Saragih, E. (2014). Designing ESP Materials for Nursing Students Based On Needs Analysis Designing ESP Materials for Nursing Students Based. *International Journal of Linguistics*, *6*(4), 59. https://doi.org/10.5296/ijl.v6i4.5983

Saribas, D., & Ceyhan, G. D. (2015). Learning to teach scientific practices: pedagogical decisions and reflections during a course for pre-service science teachers. *International Journal of STEM Education*, *2*(1). https://doi.org/10.1186/s40594-015-0023-y

Skowron, J. (2001). *Powerful Lesson Planning: Every Teacher's Guide to Effective Instruction*. Corwin Press.

Smith, D. D., & Tyler, N. C. (2011). Effective inclusive education: Equipping education professionals with necessary skills and knowledge. *Prospects*, *41*(3), 323–339. https://doi.org/10.1007/s11125-011-9207-5

Subramani, P. C. N., & Iyappan, V. (2018). Recent Trend of Teaching Methods in Education " Organised by Sri Sai Bharath College of Education. *Journal of Applied and Advanced Research*, *3*(Suppl. 1), S20–S22.

Thiagarajan, S., Dorothy a'., A., & Somme!, M. I. (1974). *Instructional Development for training teachers of exceptional children: A sourcebook*.

Tiwari, P., Séraphin, H., & Nimit R Chowdhary. (2021). Impacts of COVID-19 on tourism education: analysis and perspectives. *Journal of Teaching in Travel & Tourism*, *21*(4), 313–338.

Tomlinson, B. (2010). Materials Development. In R. Carter & D. Nunan (Eds.), *The Cambridge Guide to Teaching English to Speakers of Other Language* (pp. 66–71). Cambridge University Press.

Torregrosa Benavent, G., & Sánchez-Reyes, S. (2015). Target Situation as a Key Element for ESP (Law Enforcement) Syllabus Design. *Procedia-Social and Behavioral Sciences*, 143–148.

Trent, J. (2020). Wither teacher professional development? The challenges of learning teaching and constructing identities across boundaries in China. *Asia Pacific Journal of Education*, *40*(3), 315–329.

Ulvik, M. (2014). Student-teachers doing action research in their practicum: why and how? *Educational Action Research*, *22*(4), 518–533. https://doi.org/10.1080/09650792.2014.918901

Watkins, K. E., Nicolaides, A., & Marsick, V. (2016). Emerging Action Research Traditions: Rigor in Practice. *International Journal of Adult Vocational Education and Technology*, *7*(3), 71–81.

Weyers, M. (2006). *Teaching the FE curriculum: Encouraging active learning in the classroom*. Continuum.

Xiao, L. (2006). What can we Learn from a Learning Needs Analysis of Chinese English Majors in a University Context? *Asian EFL Journal*, *8*(4), 74–99.

Yundayani, A. (2018). Present situation analysis: Students' early characteristics in writing for academic purposes. *ENGLISH REVIEW: Journal of English Education*, *6*(2), 119–126. https://doi.org/10.25134/erjee.v6i2.1262

Yundayani, A., Emzir, & Rafli, Z. (2017). Need analysis: The writing skill instructional material context for academic purposes. *English Review: Journal of English Education*, *6*(1). https://doi.org/10.25134/erjee.v6i1.771

Attachment

Table 2.
The Result of the Need Analysis of the Student Teachers Related to Educational-based Research Method Design

Dimension	Themes	Subthemes
Present situation analysis (PSA) _ Lacks	Student teachers' strengths	The predominant method utilized by student teachers is classroom action research.
		As part of their research experience, student teachers express an awareness and interest in undertaking educational-based research.
		The opportunity for student teachers to engage in microteaching is facilitated through instructional courses.
	Student teachers' weaknesses	The implementation of educational-based research designs poses a challenge for student teachers.
		Student teachers are confronted with a fallacy regarding lesson plan design.
		Student teachers concentrate solely on teaching practice.
		They need to be made aware of the multiple roles of a teacher.
		Student teachers must be aware of the teaching procedure stages that could be incorporated into an educational-based research method.
		Integrating the learning design process and teaching practice is a knowledge gap among student teachers.
Target situation analysis (TSA) _ Wants	Objective	Incorporate a lesson plan design that considers the learning objective and the student's needs, backgrounds, characteristics, and preferences for student teachers to implement an educational-based research approach.
	Perceived	As future educators, student teachers are capable of assuming a variety of responsibilities.
	Product-oriented needs	A research method design rooted in education is necessary, as it demonstrates the teacher's multiple functions as a learning designer and researcher.
Learning situation analysis (LSA) _ Necessities	Subjective	Student teachers demand comprehensive and recent instructional materials that can effectively facilitate their multifaceted responsibilities as educators.
	Felt	Embedded with instructional design expertise, student teachers must acquire reflective teaching experience and supported teaching practice.

Process-oriented needs	Mentoring programs are necessary for student teachers to conduct educational-based research.
	Throughout the learning process, student teachers must complete multiple micro-teaching experiences.
	Student teachers must be capable of engaging in reflective instructional practice.
	The competencies essential for student teachers are teaching proficiency, instructional design expertise, and educational research acumen.

Table 3.
Elements and Outcome of Design-based Classroom Action research (DCAR) Phase

Phase of design-based classroom action research	Elements	Outcome
Phase 1: Need analysis	Current situation analysis is to determine the profile, characteristics, prior knowledge, and previous experiences of the students.	A preliminary study to identify the problem statement, research background, and research question and review
	Target situation analysis is to determine the needs of students concerning the learning objective at the end of a language course.	
	Learning needs analysis aims to identify effective learning strategies and subjective, felt, and process-oriented needs. It also influences what students wish to study and the most effective learning strategies.	
	Means analysis aims to identify the required learning scenario and learning components.	
Phase 2: Plan	Lesson plan design by considering the concept of ABCD model which covers, (1) who the Audience and What their prior knowledge; (2) What the desired change in Behavior; (3) What the Conditions under which the objectives must be completed; (4) What the Degree or standard that the students must meet to reach acceptable performance.	Teaching scenario design as the lesson plan, including with the development of necessary learning components.
Phase 3: Action and observe	A nine-step procedure referred to as the events of instruction which covers, 1) Gaining the attention of the students; 2) Informing the learner of the objective; 3) Stimulating recall of prior learning; 4) Presenting the content; 5) Providing learning guidance; 6) Eliciting the performance; 7) Providing feedback; 8) Assessing the performance.	Teaching procedure including pre-teaching, during-teaching, and post-teaching.
Phase 4: Reflection	1) Mapping: What am I to do as a teacher? 2) Informing; What is the significance of my instruction? What was my goal? 3) Questioning; How I came to be this way? How was it possible for my current perspective on teaching to evolve? 4) Evaluation: How can I modify my teaching?	A logical thinking required to interpret a teaching experience which is descriptive, analytical, and critical.

Table 4.
The Results of Expert Review

	Expert 1	Expert 2	Expert 3	Expert	Expert
Clarity					
Clarity of stages in the design of the research method.	5	3	5	5	4
The suitability of the research method design with the results of the needs analysis.	5	3	5	5	5
Objectivity clarity in the research method design that results.	5	3	5	5	4
The stages comprising this research method design adhere to the basic principles of research methods.	5	4	5	5	4
This research method design is applicable to educational research.	5	3	5	5	4
Impact					
The stages outlined in this research method design correspond to the competency requirements of a teacher.	5	3	5	5	5
The stages in developing this research method align with the stages in conducting learning scenarios.	4	4	5	5	4
The research method design enables student teachers to analyse students' needs before developing their learning process.	5	4	5	5	5
The research method's design embodies the teacher's proficiency as a learning designer and researcher in conjunction with their teaching practice expertise.	5	4	5	5	5
Feasibility					
This research method design is particularly applicable to student teachers.	5	4	5	5	5
This research method design is well-suited for implementation in the field of educational research.	4	4	5	5	5
Incorporating a component of student needs analysis, the design of this research method enhances the notion of classroom action research.	5	4	5	5	5