Journal of Pedagogy and Education Science
Vol. 04, No.03, pp. 742-760
journal.iistr.org/index.php/JPES
DOI: 10.56741/IISTR.jpes.001354

Evaluating the Effectiveness of Backward Design in Enhancing Formative Assessment Practices

[1]Mojahed Mousa*
Corresponding Author: * mojahed.mousa@staff.alquds.edu
[1] Al-Quds University, Jerusalem, Palestine

ARTICLE INFO

Article history
Received 29 August 2025
Revised 16 September 2025
Accepted 16 September 2025

ABSTRACT

The research investigates backward design implementation in formative assessment practices to determine its effects on instructional effectiveness, student engagement, and curriculum coherence. It employed a mixed-methods design to gather data from 26 in-service teachers who specialized in STEM and English as a Foreign Language at public, private, and UNRWA schools in Palestine. The research used a combination of structured questionnaires and follow-up interviews to obtain both quantitative and qualitative data. Results showed that teachers acknowledge backward design benefits, which include better student comprehension and improved assessment-objective alignment and student motivation, yet they faced implementation difficulties. Teachers indicated that backward design planning led to increased student participation, better critical thinking abilities, and stronger student ownership of their learning. The participants suggested three modifications to backward design, which included adaptable templates, lighter curriculum requirements, and student reflection integration. The research indicates backward design shows potential to improve formative assessment, but its successful implementation needs specific professional development and contextual modifications. It also demonstrates backward design's value for teaching and learning, yet emphasizes the necessity of combining it with conventional curriculum methods in various educational contexts.

Keywords
Backward Design
Formative Assessment
Instructional Effectiveness
Mixed-Methods Research
Student Engagement

This is an open-access article under the CC–BY-SA license.

Introduction

Educators recognize formative assessment as an essential learning tool that gives instant student understanding while allowing teachers to adjust instruction [1], [2]. Studies demonstrate numerous advantages of formative assessment, yet many instructors face difficulties when implementing it consistently in their teaching practices [3], [4]. Backward design stands as a curriculum planning system that starts with final objectives to create instructional activities and assessments [5]. Educators who integrate formative assessment with backward design principles develop learning experiences that lead to better student understanding and achievement [6], [7].

Backward design requires educators to specify learning objectives first, then determine desired outcomes and construct assessments that evaluate student progression toward those objectives [8]. The educational framework of backward design supports the essential functions of formative assessment because it helps track student progress and direct teaching choices [9], [10]. The integration of formative assessment into backward design transforms assessment into an essential teaching element rather than an optional addition to the learning process [11]. The combination of assessments with learning goals creates data that teachers can use to improve instruction effectively [12], [13].

Research demonstrates that backward design strengthens formative assessment effectiveness by establishing more defined educational planning that produces better instructional coherence [14]. Through backward design, teachers are able to identify the gaps in students' understanding, and they are also able to adapt the instructions they provide to their diverse students to suit their needs while developing their growth mindset [15]. Moreover, the design can lead to better educational outcomes because it enables continuous evaluation and improvement of teaching methods through its cyclical process [16], [17].

Research on backward design with formative assessment integration in academic literature and educational practice was not evident enough. In addition, research on backward design and formative assessment shows individual advantages, but limited studies have investigated their combined impact on teaching effectiveness [18], [19]. Research on backward design-formative assessment synergy and their implementation challenges remains limited in academic literature, which requires additional studies to explore these areas [20], [21].

This research investigates how backward design enhances formative assessment practices within educational contexts. Backward design was analyzed as a framework for designing and implementing formative assessments that meet learning goals while supporting students' needs and deep learning through existing research (see also [22], [23]. This study provides insights into the educational implications of this method as well as its effects on teacher training, curriculum development, and educational policy making (see also [22], [23], [24])

This research aims to investigate the effectiveness of backward design in instructional planning; it also aims to test its effect on teaching and learning methods. Another focus for this research is comparing backward design to the traditional curriculum planning methods through the eyes of the teachers. The areas of comparison will be analyzing the effects on lesson coherence, student engagement, and instructional effectiveness. In addition to that, this study aims to find the main obstacles that teachers experience while applying backward design in their teaching methods and also identify the necessary professional development programs to improve the successful implementation of the design. This research focuses on these elements to find out the ability of the design to be successful across multiple educational settings and to understand its real-world application.

Therefore, this study seeks to answer the following questions:

- **RQ1**: To what extent do factors such as gender and school type influence teachers' perspectives and effectiveness in utilizing backward design for formative assessment?
- **RQ2**: How do teachers navigate the challenges associated with integrating backward design in diverse educational settings, and what strategies do they employ to overcome these obstacles?
- **RQ3**: How do teachers perceive the effectiveness of backward design compared to traditional curriculum planning, and what key factors shape their perspectives?
- **RQ4**: To what extent does implementing backward design enhance lesson coherence, student engagement, and overall instructional effectiveness?
- **RQ5**: How can professional development initiatives be designed to support teachers in effectively integrating backward design into their instructional practices?
- **RQ6**: How does the integration of backward design and traditional curriculum design impact student learning outcomes and instructional effectiveness in diverse educational contexts?

Literature Review

A. Formative assessment in student-centered learning

Student-centered learning (SCL) and formative assessment are closely related because they both stress student involvement in learning and deliver targeted educational experiences that meet students' needs [25], [10]. Student-centered classrooms use formative assessment to help students develop self-regulated learning skills by providing continuous feedback about their achievements and weaknesses [1], [15]. This method transforms traditional summative assessment into an ongoing learning process that allows students to lead their educational advancement [11], [26]. Studies demonstrate that students who participate in formative assessment activities like self-assessment and peer feedback develop better metacognitive abilities and improved knowledge about their learning processes [27], [28]. These educational results support the main goals of SCL, which focus on student empowerment through autonomous learning.

Student-centered learning spaces that incorporate formative assessment enable teachers to create individualized instructional approaches that accommodate different learning requirements [29]. Through formative assessment, teachers obtain immediate information about student comprehension, which helps them change their teaching methods instantly and provide individualized support [3]. The educational assessment methods, including exit tickets and think-pair-share activities, together with formative quizzes, enable teachers to detect student misconceptions for lesson modification purposes [14]. SCL promotes collaborative learning through assessments where students assess themselves and give helpful feedback to their peers [19]. Through collaborative approaches, students achieve better academic results while developing a learning community that demonstrates shared responsibility for education, which student-centered pedagogy emphasizes [30].

The implementation of formative assessment within student-centered learning environments faces multiple implementation barriers. Teachers need to move away from traditional teaching methods to develop facilitative skills that demand in-depth knowledge of formative assessment techniques [4], [17]. Teachers also need ongoing professional development alongside continuous support to acquire the abilities and self-assurance required for successful SCL formative assessment implementation [31]. A classroom environment that treats errors as growth opportunities alongside open teacher-student conversations stands as the foundation for successful formative assessment practice [32], [19]. The absence of such a culture turns formative assessment into a shallow procedure that fails to become a learning transformation tool. The successful resolution of these challenges demands an integrated

approach that combines policy backing with resource distribution and dedication to building collaborative learning environments [23], [16].

B. Enhancing Assessment Quality Through Backward Design

Through backward design, educators achieve better assessment development, clarity, and coherence, which minimizes the mismatch between instructional content and assessment criteria [6]. Educators who start with learning goals create assessments that become more meaningful and challenging while accurately measuring student comprehension [11]. The alignment between teaching and assessment goals stands as a crucial factor for formative assessment because it enables the delivery of actionable feedback, which supports student learning development [3].

Backward design enhances assessment quality through its focus on authentic performance-based assessments, which measure students' deep learning abilities and knowledge application [8]. In comparison with traditional assessment methods, backward design demonstrates assessments that allow students to understand through practical work and problem-solving activities, while the traditional methods mainly evaluate the ability of students to memorize information and their basic cognitive functions [7]. Performance tasks, together with portfolios and project-based assessments, function as typical backward design tools to measure higher-order thinking skills and learning transfer [16]. These assessment methods improve both assessment validity and reliability while creating meaningful learning experiences that mirror real-world complexities [20].

Material and Methods

A. Research model

The research model of this study involves a mixed-methods approach for data collection; it also focuses on diverse participants from different types of schools. This approach has proved to be a valid way to collect and analyze data (see [33]). The model is framed within the context of training and practical application, where in-service teachers were trained to use backward design with emphasis on its various stages. The designed framework enables this study to explore how effective backward design can be in the teaching and learning processes.

B. Research sample

The research sample includes 26 teachers, 21 females, and 5 males, from three different educational institutions. The participants consist of 19 public school teachers, 4 private school teachers, and 3 United Nations Relief and Works Agency for Palestine Refugees (UNRWA) school teachers. The participants specialize in STEM subjects or English as a Foreign Language (EFL) with multiple disciplines included. The science teachers make up 9 of the participants, while English as a Foreign Language specialists 9, and 4 mathematics teachers. The research

selected this diverse participant group to provide a broad perspective on the application of backward design across different schools and subject areas.

The research used purposive sampling to achieve representation from multiple educational institutions and subject specializations. The selection of participants occurred because they expressed interest in backward design training for educational implementation. The study adopted this selection method to achieve better depth and relevance, so it included educators who teach and develop instruction actively. The study includes teachers from different school types and disciplines to provide a complete understanding of backward design implementation across different educational settings.

C. Data Collection Tools and Procedure

A mixed-method approach was applied in this research to gather the data, and this was a combination of a questionnaire and a follow-up interview with the participants who are working as in-service teachers and studying in the Master of Arts in Teaching (MAT) program at Al-Quds Bard College, Al-Quds University. There are three main sections in the questionnaire, and that are (1) teachers' curriculum design experiences, (2) their perceptions about backward design effectiveness relative to traditional methods, and (3) backward design effects on teaching and learning. The questionnaire was structured to make it possible to evaluate teachers' backward design understanding and implementation within their educational settings.

Moreover, semi-structured interviews were conducted with the participants after they implemented the backward design in their classrooms. The interviews focused on two main things: the advantages and the challenges teachers faced while implementing the design in their classrooms. Teachers here took the chance to explain the implementation process of the design, focusing on its impact on their lesson coherence, student engagement, and instructional effectiveness. This helps in producing extensive qualitative data.

The participant teachers were involved actively during the study in training sessions to enhance their knowledge of backward design and its three stages: identify desired results, determine acceptable evidence, and plan learning experiences and instruction. This procedure helps the teachers to create their lesson plans and teaching methods after intensive training on applying the design and its principles. Thus, quantitative and qualitative data were collected to assess the experiences of the teachers in implementing the design, and the advantages and the obstacles they faced in their different educational settings.

D. Data analysis

This study used quantitative and qualitative methods to analyze the data that was collected. Quantitative measurement through descriptive statistics was used to analyze teachers'

responses to the questionnaire. The instrument reliability was confirmed through Cronbach's alpha calculation, which demonstrated that each section measured its intended concepts effectively. The study employed ANOVA and t-test statistical methods to determine the differences in teacher awareness levels between school types and subject areas.

The thematic analysis of open-ended question responses identified recurring patterns and emerging themes from qualitative data. The analysis required a detailed response evaluation to detect both recurring patterns and new themes. The research employed an inductive approach instead of pre-defined categories to identify themes that naturally emerged from the collected data. The research revealed three main findings about teacher backward design implementation challenges and benefits, and student engagement with backward design structured lessons. The themes received extensive review and refinement until their final analysis to guarantee the credibility of the findings.

E. Ethical

Ethical considerations were processed in this study to ensure the integrity of the research and the responsibility of the researcher. These considerations were the following:

- Informed *Consent*: All participants received complete details about the study, which included its research goals, methods, and possible advantages or disadvantages.
- *Confidentiality and Anonymity*: The researchers protected participant identities through anonymization of personal information and responses. The researchers stored the data securely while limiting access to authorized researchers only.
- *Right to Withdraw*: The participants maintained the right to exit the study whenever they wanted without facing any consequences. The participants received information about their right to withdraw from the study, which would not impact their professional career.
- *Transpa*rency *and Integrity*: Participants were informed about the purpose of the study and how the findings would be used. The research was conducted with honesty and transparency, ensuring unbiased data collection and analysis.

Results

A. Descriptive statistics and reliability analyses

A reliability analysis of the survey instrument was conducted through Cronbach's alpha ($\alpha = 0.856$), showing high reliability. An alpha value above 0.8 suggests strong internal consistency, confirming that the items in the instrument are effectively measuring the same underlying construct. This high alpha value reflects that the questions consistently assess teachers' perspectives, experiences, and effectiveness in utilizing backward design for formative assessment.

The mean score and standard deviation (M = 34.92, SD = 3.005) offer insights into the central tendency and variability of the data. The mean score represents the typical response level among teachers regarding backward design and formative assessment, while the standard deviation reveals the degree of variation in participants' responses. With a relatively small standard deviation, the results suggest that teachers' responses were consistent, with limited variability around the mean.

When comparing male and female teachers, the mean scores for male teachers (M = 35.00, SD = 2.00) and female teachers (M = 34.90, SD = 3.23) were found to be very similar, with males scoring slightly higher. However, the standard deviation for female teachers was higher, indicating more variability in their responses. The t-test (t = 0.062, p >.05) revealed that the difference between male and female teachers was not statistically significant. The p-value (p-value=0.686) suggests that gender does not significantly influence teachers' use of backward design for formative assessment, and the observed differences are likely due to random variation.

The mean scores by school type (M_public=35.21, M_private=33.75; M_UNRWA=34.92, F= 0.383 p>.001; r=0.119, p>.001) revealed that public school teachers scored the highest, followed by UNRWA school teachers, with private school teachers scoring the lowest. Despite these differences, the results from the ANOVA (F = 0.383, p >.001) indicated that the variance in mean scores across school types was minimal, and the p-value further confirmed that these differences were not statistically significant. Thus, we can confirm that the school type has no meaningful effect on teachers' use of backward design for formative assessment, meaning that school type does not encourage their teachers to implement backward design. Additionally, the correlation analysis revealed a very weak positive relationship between school type and the measured variable (r = 0.119, p >.001). Given that the correlation was not statistically significant, no strong association between school type and teachers' responses can be inferred (RQ1).

B. Challenges in Implementing Backward Design

The interview data showed that in-service teachers encountered several significant challenges while implementing backward design. The most significant issue teachers encountered was time constraints (see Fig. 1). Teachers reported problems implementing backward design because the school schedule did not accommodate enough time for planning and execution. The implementation of backward design faced additional challenges because schools reduced their weekly schedule to four days due to salary issues, which shortened the available time for effective execution. The need for multiple sessions to complete a unit through

backward design proved more demanding than traditional planning methods, thus making it difficult to fit into the available time frame.

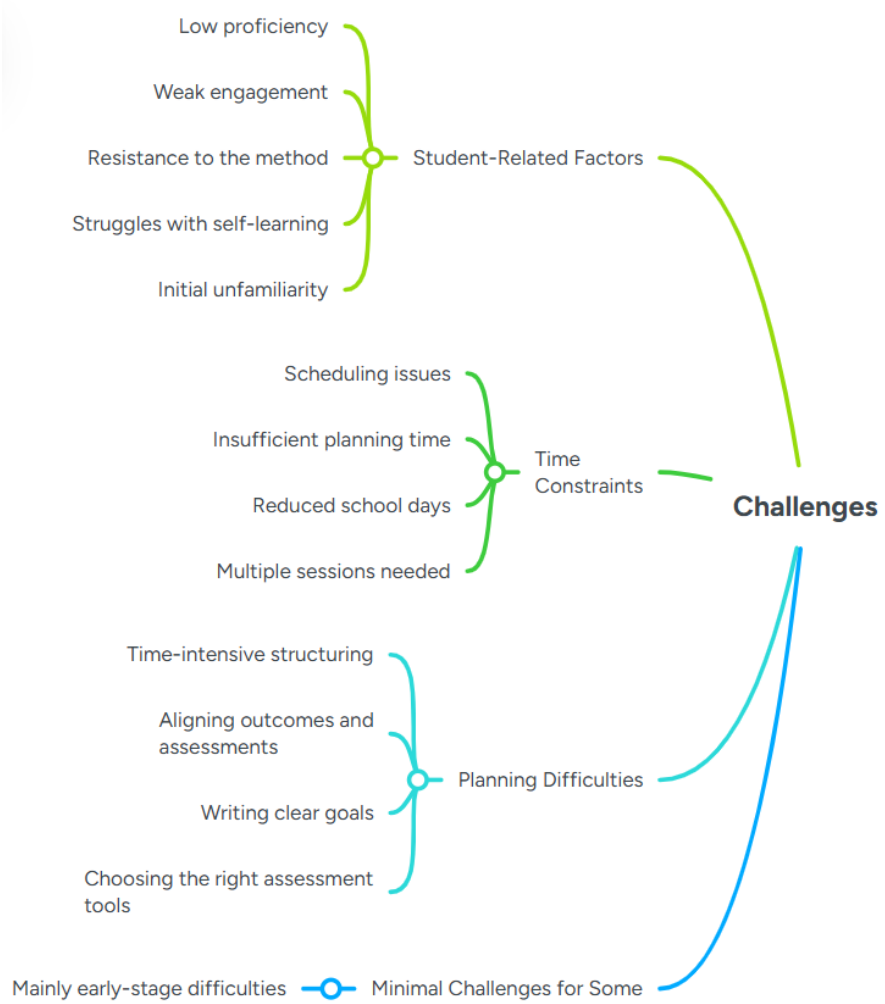

Fig. 1. Challenges of Backward Design According to Teachers' Responses

The implementation of backward design faced major challenges because students demonstrated low proficiency levels and showed weak engagement while also resisting this teaching approach. Teachers encountered difficulties when trying to motivate students who either refused to learn or struggled to convert self-directed learning into purposeful objectives. Students initially found the concept difficult to understand, according to several responses, which required additional support and time for adaptation.

The planning process was another recurring difficulty. Teachers explained that backward design demanded extended time for lesson organization and the process of linking learning objectives to assessments and extracting broad concepts from specific targets. The planning process under backward design took longer and required more effort than traditional educational methods. Several teachers experienced issues when creating specific big goals and selecting suitable assessment methods that matched their students' requirements.

A few teachers mentioned they encountered no specific challenges with backward design implementation, or their challenges occurred mainly during the initial phase of adoption. The survey results show that time constraints, together with planning difficulties and student-related factors, emerged as the primary obstacles for backward design implementation (RQ2).

C. Benefits of backward design compared to traditional curriculum design

The data analysis of in-service teachers revealed the principal advantages of backward design over traditional curriculum planning (see Fig. 2). Their opinions stress the importance of backward design because it produces effective learning through the alignment of objectives with assessments while improving instructional strategies and increasing student motivation and engagement.



Fig. 2. Benefits of Backward Design According to Teachers' Responses

Backward design stands out because it provides clear and coherent methods for curriculum planning, according to several teachers who participated in the study. Backward design enables teachers to develop structured curricula through the creation of clear learning outcomes and objectives from the beginning. Teachers who follow this structured planning method can eliminate both excessive activities and content coverage because each lesson must directly support the established learning objectives. Teachers achieve better results when they

understand the complete scope of the curriculum because they learn to identify essential concepts and skills instead of focusing on content coverage. This method creates an integrated and coherent learning experience for students.

Teachers observed that the approach enables students to achieve a deeper understanding of the material. Several teachers pointed out that backward design supports deep student learning because it prioritizes meaningful concepts above surface-level memorization. The backward design approach helps students learn authentically because it starts with goal setting before building lesson plans and assessment methods. This method enables teachers to create better connections between lessons, thus students can understand difficult concepts while applying their knowledge to real situations.

Additionally, teachers found that backward design improves their teaching methods. Teachers who link their educational targets with assessment methods and instructional techniques develop structured lesson plans better. The connection enables teachers to choose teaching methods and performance tasks that directly help students meet their learning objectives. Several teachers reported that this structured method makes teaching more effective because it removes unnecessary content while creating purposeful and interesting lessons.

The benefits of backward design include higher student engagement and motivation as two main outcomes. Teachers observed that when students understand the learning expectations and purposes, their involvement with the educational process becomes more active. Through backward design, students develop greater independence in learning because they assume responsibility for their academic progress and self-assessment. Student empowerment through backward design methods leads to better student participation and internal motivation while making them take ownership of their educational path. Teachers observed that students achieve higher assessment scores and improve their abilities to correct misconceptions because backward design structures learning intentionally.

Lastly, backward design promotes creativity through innovative teaching methods and active learning approaches, according to various teachers who have used this approach. Students experience authentic learning situations that encourage both critical thinking and innovative idea generation. The teaching approach enables teachers to employ multiple instructional approaches alongside fresh teaching materials, which create interactive and dynamic lesson experiences (RQ3).

D. Lessons planned using backward design

Several major themes emerged in analyzing the responses provided by in-service teachers regarding how their students reacted to lessons planned using backward design. The responses show that themes include increased student interaction, heightened motivation,

deepened understanding, initial challenges, and the effectiveness of student-centered approaches.

Student participation and interaction rates increased significantly based on teacher responses. The teaching staff observed better engagement from their students, especially from students with average achievement levels. Students showed strong interest in finishing their work according to multiple responses, and they interacted more during performance tasks and displayed intense enthusiasm. Backward design created an engaging classroom atmosphere, which made students actively participate by asking about upcoming activities before reaching them. Additionally, strategies such as cooperative learning, interactive game-based learning, and the Six Thinking Hats method facilitated engagement and encouraged students to think more critically.

The study revealed that students became more motivated as one of its major discoveries. The backward design methodology, which includes precise learning objectives alongside structured evaluation methods, made lessons more meaningful according to multiple teaching professionals. The educational content received stronger student interest, which caused them to actively work on mastering and applying what they learned. For example, some teachers reported that students' understanding in one of the English classes was developed by comprehending the process of individual assignments that led to their final persuasive essays, which consequently resulted in enhanced class participation and better self-assessment of their progress. Thus, it can be claimed that students developed intrinsic motivation to learn through the structured framework of backward design, which basically helped the students to understand the purpose of their learning.

The students achieved a deeper understanding of the material as one of the main results. The main areas of development here, as reported, were students' understanding of concepts through performance-based tasks. In addition to that, the assignments improved their presentation skills of knowledge. For example, a participant teacher observed students complete their work at a level that exceeded all expectations regarding their mastery of the subject matter. Teachers observed that students maintained their motivation through self-learning activities and continuous engagement, which demonstrated the approach's ability to help students retain and apply knowledge in the long term.

Despite the positive outcomes, teachers acknowledged specific initial challenges. Teachers noticed that their students needed time to understand the backward design structure and expectations, which resulted in their initial confusion. The activities enabled students to achieve significant progress in their participation levels, together with their understanding

abilities. The reports from students proved that this teaching strategy leads to long-lasting results because they showed how they applied new learning to their daily lives.

Finally, student-centered teaching methods proved highly effective when implemented through the backward design approach. Teachers proved that student-driven learning produced superior achievement results in tasks. One teacher described implementing a writing task for fifth graders, where they set clear goals, used peer review as an assessment tool, and modeled the process to scaffold learning. Through its structured student-centered framework, the method enabled students to become more invested in their own learning, which resulted in better results (RQ4).

E. Modifications Suggested for the Backward Design Approach

The responses from in-service teachers regarding potential modifications to the backward design approach revealed a diverse range of perspectives. A large number of teachers suggested particular improvements, yet most participants decided that no modifications were needed. The backward design approach did not need any alterations according to ten teachers among the participants. The majority of educators find the present backward design framework to be useful because it fulfills their instructional requirements. The remaining responses pointed out multiple possible improvement areas. The instructional design, together with lesson planning, emerged as the primary focus among all proposed modifications. Teachers emphasized that the planning of units must start earlier, with sufficient alignment to available time, as it would enhance the effectiveness of the approach. The teachers recommended that backward design would become more effective when the curriculum load was decreased while increasing the number of lessons.

Additionally, the responses highlighted that backward design needs to become more adaptable as a significant category. A teacher suggested transforming the three-stage template into a basic design that would allow flexible information addition. It was also suggested to extend collaborative planning sessions and divide complex goals into smaller parts, and give teachers the freedom to modify their lessons based on student needs and feedback. The responses show that backward design offers a structured framework, yet some instructors perceive it as too rigid, so they want more flexibility.

Teachers also suggested improving both the educational materials and the instructional activities that backward design uses. Several respondents suggested "adding more images" and incorporating "some fields, such as images," which may indicate a need for more visual elements in instructional planning. Additionally, one teacher proposed introducing "new exercises related to real life," suggesting a preference for practical, application-based learning experiences. Another participant recommended "focusing more on tasks so that they serve as a better alternative to exams," which indicated their desire for assessment variety.

The last observed theme involved integrating student reflection into the backward design structure. Two teachers recommended incorporating a "Reflection" section, which could appear either as a separate unit conclusion or embedded inside instructional templates to track student challenges and thoughts. This indicates a potential gap in the existing model, where student self-assessment and metacognition could be further emphasized (RQ5).

F. Backward design replacing traditional curriculum

The responses regarding backward design adoption for replacing traditional curriculum design in teaching practice contained different opinions from in-service teachers. A large number of teachers preferred backward design because it centers on deep understanding while also directing students toward specific goals and strengthening their critical thinking abilities. Teachers presented mixed opinions about teaching methods by supporting a combination of backward design and traditional curriculum design, while a small minority rejected any substitution of established methods.

Multiple participants chose backward design because they recognized its effectiveness for developing deep understanding and long-term learning. Teachers highlighted that backward design gives instructors a clear direction toward desired learning outcomes, which results in organized educational processes. The implementation of backward design leads to improved student outcomes because it develops metacognitive abilities, analytical thinking, and promotes student-centered education. One respondent emphasized that backward design "encourages the metacognition skills of students," while another stated that it "makes the learner the center of the educational process, capable of building their knowledge independently." Furthermore, several teachers linked backward design to better classroom outcomes, with one participant asserting that they had achieved better results with students compared to traditional design.

Additionally, some responses demonstrated the backward design's complete design framework that produces better instructional unit coherence. Participants described it as a technique that "provides greater comprehensiveness to the unit" and "helps both students and teachers understand and analyze lessons more quickly and easily." Moreover, one respondent emphasized that backward design is beneficial because it moves education away from "rigidity and traditionalism" while equipping students with useful skills for their daily lives and future careers.

Despite the strong support for backward design, teachers advocated for its use as an additional tool rather than a replacement for traditional curriculum design. The teachers supported both the structured framework and adaptable nature of traditional teaching methods while recommending their combination with backward design. The approach of

backward design works best when it functions as an addition to traditional curriculum design because backward design creates purposeful learning through outcome alignment, while traditional methods allow teachers to adapt their teaching to specific classroom needs. Various instructors shared similar perspectives by supporting the need to preserve multiple instructional approaches.

A small number of educators showed doubt about backward design effectiveness across all teaching scenarios and opposed its total substitution of traditional educational methods. The implementation of backward design remains limited to specific subjects because participants agreed that it works best for activity-based subjects, but poses challenges when teaching subjects like literature. One teacher strongly opposed the idea of switching to traditional methods while suggesting that both approaches should blend. The research shows that backward design receives praise for its structured approach to teaching, but educators continue to see value in traditional teaching methods, which support classroom creativity and adaptability (RQ6).

Discussion

The study findings demonstrate key points about backward design use in formative assessment, together with its advantages and disadvantages, and teacher assessment of its performance relative to traditional curriculum design. Teachers demonstrated universal comprehension of backward design principles as well as their effects on formative assessment methods. The small variation in teacher responses is indicated by the low standard deviation, which shows uniformity in their views about backward design's ability to guide their instructional planning. These findings align with prior research, which demonstrates backward design's structured approach as a vital element for enhancing instructional planning and assessment alignment [5].

The statistical results indicated no considerable distinction in backward design usage between male and female teachers since they demonstrated comparable efficiency and participation in this instructional framework. The analysis showed no statistical differences between public schools, private schools, and UNRWA educational institutions, which indicates that institutional settings do not affect teacher adoption of backward design principles. The research findings differ from other studies, which show that school type affects pedagogical methods because institutions vary in terms of resources and administrative support [34]. The lack of significant variance in this study could be attributed to the widespread availability of professional development opportunities that support teachers across different school settings.

Despite the understanding of its advantages, the main obstacle teachers encountered when implementing backward design was time constraints. Teachers found it difficult to manage their workload because they needed to create detailed plans before aligning

assessments to learning objectives, despite having shorter school schedules. The findings confirm earlier research studies, which show backward design implementation demands extensive time investment, particularly when operating within established curricular structures [35]. The major student-related difficulties that teachers experienced involved low student engagement, together with challenges to adapt to backward design principles. The students faced problems with independent learning tasks as well as difficulties in understanding performance-based assessment requirements. The results demonstrate that teachers need additional training along with scaffolding methods to support their students in making the transition to this model. Teachers experienced difficulties during the planning stage because they encountered problems creating general objectives and choosing suitable evaluation methods. The results demonstrate that backward design implementation needs additional training alongside resources to help educators achieve success (see also [6], [7].

Teachers acknowledged multiple benefits from backward design despite encountering implementation obstacles. The main benefit of backward design was its power to enhance understanding because it made lessons goal-focused with assessment-driven instruction. This aligns with research that backward design leads to better conceptual understanding and critical thinking abilities [18]. The implementation of backward design, according to teachers, improved classroom instructional coherence and eliminated superfluous content while boosting student engagement. The research findings demonstrated that backward design promotes stronger student involvement in classroom activities. The students became more interested in their learning and took ownership of it when they understood what they needed to learn and how their work would be assessed. Backward design serves as an effective method for student-centered learning because it enables students to take part actively and manage their learning process effectively [36].

Several instructors proposed improvements to the backward design methodology, which they believed would improve both its application and its results. Teachers repeated the need for more flexibility by suggesting a basic template alongside flexible lesson formats. The field maintains ongoing discussions about finding the right balance between curriculum planning systems and the requirement for flexible approaches in different learning settings [29]. Some teachers proposed adding visual elements and interactive components to their lesson planning process. The teachers believed that adding real-life examples and images to instructional materials would help students understand the content better while keeping them more interested in learning. Multiple educators supported adding student reflection activities to backward design because this would help students develop metacognitive skills while

assessing their work. The proposed recommendations match current educational theories that place reflection at the core of deep learning processes [37].

The research results showed that backward design enjoyed more popularity than traditional curriculum design, yet many teachers opted for a combination of both methods. Traditional curriculum design received praise from teachers because it allows teachers to accommodate different classroom requirements. The study aligns with broader curriculum research, which supports hybrid approaches that combine predetermined learning objectives with flexible teaching methods [38]. The teachers expressed reservations about eliminating traditional curriculum design because backward design might not be suitable for all teaching contexts. Thus, the research needs to investigate backward design adaptations for specific subjects because these modifications impact the effectiveness of the approach across different academic disciplines.

Conclusion

The research demonstrates that backward design functions as an effective educational framework that enhances student learning while improving engagement and assessment alignment. The complete potential of backward design requires improvement because time constraints, student adaptation difficulties, and planning complexity requirements exist. The majority of teachers endorse backward design implementation, yet practical solutions for different educational settings seem to combine backward design principles with conventional curriculum design methods. Consequently. Teachers will be able to create more effective, meaningful learning experiences for their students once these challenges are addressed.

Recommendations

The research results from this study produce several implications for educational practice. First, educational institutions should direct their professional development programs toward teaching teachers efficient backward design planning and implementation methods that work within limited time frames. Training programs should teach teachers how to link learning objectives to assessments while teaching student-focused teaching methods. Second, school administrators need to develop policies that support flexible curriculum planning because this enables teachers to execute backward design effectively. The implementation of backward design could involve administrators redesigning professional learning communities for collaborative unit planning and assessment design support (see also [39]). Finally, future research needs to study the extended effects of backward design on student learning results throughout various subjects and grade levels. Additional studies could also examine how technology integration helps backward design implementation within digital and blended learning settings.

Acknowledgment

The subjects of this research have been generously awarded scholarship support through the "Qatar Scholarship" program at "Education Above All Foundation (EAA).

Conflict of Interest

The authors declare no conflict of interest.

References

[1] P. Black and D. Wiliam, "Assessment and classroom learning," *Assessment in Education: Principles, Policy & Practice*, vol. 5, no. 1, pp. 7–74, 1998, doi: 10.1080/0969595980050102.
[2] J. Hattie, *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. New York, NY: Routledge, 2009.
[3] M. Heritage, *Formative Assessment: Making it Happen in the Classroom*. Thousand Oaks, CA: Corwin Press, 2010.
[4] R. E. Bennett, "Formative assessment: A critical review," *Assessment in Education: Principles, Policy & Practice*, vol. 18, no. 1, pp. 5–25, 2011, doi: 10.1080/0969594X.2010.513678.
[5] G. Wiggins and J. McTighe, *Understanding by Design*, 2nd ed. Alexandria, VA: ASCD, 2005.
[6] J. McTighe and K. O'Connor, "Seven practices for effective learning," *Educational Leadership*, vol. 63, no. 3, pp. 10–17, 2005.
[7] C. A. Tomlinson and J. McTighe, *Integrating Differentiated Instruction and Understanding by Design*. Alexandria, VA: ASCD, 2006.
[8] G. Wiggins and J. McTighe, *Understanding by Design Framework*. Alexandria, VA: ASCD, 1998.
[9] D. R. Sadler, "Formative assessment and the design of instructional systems," *Instructional Science*, vol. 18, no. 2, pp. 119–144, 1989, doi: 10.1007/BF00117714.
[10] D. J. Nicol and D. Macfarlane-Dick, "Formative assessment and self-regulated learning: A model and seven principles of good feedback practice," *Studies in Higher Education*, vol. 31, no. 2, pp. 199–218, 2006, doi: 10.1080/03075070600572090.
[11] L. M. Earl, *Assessment as Learning: Using Classroom Assessment to Maximize Student Learning*. Thousand Oaks, CA: Corwin Press, 2003.
[12] M. Heritage, "Formative assessment: What do teachers need to know and do?," *Phi Delta Kappan*, vol. 89, no. 2, pp. 140–145, 2007, doi: 10.1177/003172170708900210.
[13] J. Chappuis, *Seven Strategies of Assessment for Learning*. Boston, MA: Pearson, 2015.
[14] D. Fisher and N. Frey, *Checking for Understanding: Formative Assessment Techniques for Your Classroom*. Alexandria, VA: ASCD, 2007.
[15] J. Hattie and H. Timperley, "The power of feedback," *Review of Educational Research*, vol. 77, no. 1, pp. 81–112, 2007, doi: 10.3102/003465430298487.
[16] L. Darling-Hammond, L. Flook, C. Cook-Harvey, B. Barron, and D. Osher, "Implications for educational practice of the science of learning and development," *Applied Developmental Science*, vol. 24, no. 2, pp. 97–140, 2020, doi: 10.1080/10888691.2018.1537791.
[17] D. Wiliam, *Embedded Formative Assessment*. Bloomington, IN: Solution Tree Press, 2011.
[18] J. McTighe and G. Wiggins, *Essential Questions: Opening Doors to Student Understanding*. Alexandria, VA: ASCD, 2013.
[19] S. M. Brookhart, *How to Use Grading to Improve Learning*. Alexandria, VA: ASCD, 2017.
[20] L. A. Shepard, W. R. Penuel, and J. W. Pellegrino, "Using learning and motivation theories to coherently link formative assessment, grading practices, and large-scale assessment," *Educational Measurement: Issues and Practice*, vol. 37, no. 1, pp. 21–34, 2018, doi: 10.1111/emip.12189.
[21] H. L. Andrade, "Classroom assessment in the context of learning theory and research," in *Handbook of Human and Social Conditions in Assessment*, G. J. Cizek, M. B. Holter, and K. F. Geisinger, Eds. New York, NY: Routledge, 2019, pp. 17–32.
[22] T. R. Guskey, "How classroom assessments improve learning," *Educational Leadership*, vol. 60, no. 5, pp. 6–11, 2003.
[23] M. Fullan, *The New Meaning of Educational Change*, 4th ed. New York, NY: Teachers College Press, 2007.

[24] L. Alvarez-Llerena, J. Coutinho dos Santos, D. E. Vélez Sacoto, and J. M. Vera Balbuca, "Exploring the application of the Backward Design Model in EFL classrooms: Teachers' perceptions and practices," *Research, Society and Development*, vol. 12, no. 4, e14912441102, Apr. 2023, doi: 10.33448/rsd-v12i4.41102.
[25] M. Weimer, *Learner-Centered Teaching: Five Key Changes to Practice*. San Francisco, CA: Jossey-Bass, 2002.
[26] I. Lungu, "Backward Design – an Innovative Instructional Model in Planning Higher Education Courses," *Bulletin of the Transilvania University of Braşov, Series VII: Social Sciences & Law*, vol. 17 (66), 2025, doi: 10.31926/but.ssl.2024.17.66.4.9.
[27] H. L. Andrade, "Students as the definitive source of formative assessment: Academic self-assessment and the self-regulation of learning," *NERA Conference Proceedings*, vol. 25, 2010. [Online]. Available: https://opencommons.uconn.edu/nera_2010/25
[28] E. Panadero, G. T. Brown, and J. W. Strijbos, "The future of student self-assessment: A review of known unknowns and potential directions," *Educational Psychology Review*, vol. 28, no. 4, pp. 803–830, 2016, doi: 10.1007/s10648-015-9350-2.
[29] C. A. Tomlinson, *The Differentiated Classroom: Responding to the Needs of All Learners*, 2nd ed. Alexandria, VA: ASCD, 2014.
[30] D. W. Johnson and R. T. Johnson, "An educational psychology success story: Social interdependence theory and cooperative learning," *Educational Researcher*, vol. 38, no. 5, pp. 365–379, 2009, doi: 10.3102/0013189X09339057.
[31] H. Timperley, A. Wilson, H. Barrar, and I. Fung, *Teacher Professional Learning and Development: Best Evidence Synthesis Iteration*. Wellington, NZ: Ministry of Education, 2007.
[32] C. S. Dweck, *Mindset: The New Psychology of Success*. New York, NY: Random House Publishing Group, 2006.
[33] M. Mousa, "AI-supported formative assessments: Enhancing student-centered learning and teacher perceptions," *Journal of Pedagogy and Education Science*, vol. 4, no. 2, pp. 127–141, 2025, doi: 10.56741/jpes.v4i02.857.
[34] M. Fullan, *The New Meaning of Educational Change*, 5th ed. New York, NY: Teachers College Press, 2015.
[35] H. L. Reynolds and K. D. Kearns, "A planning tool for incorporating backward design, active learning, and authentic assessment in the college classroom," *College Teaching*, vol. 65, no. 1, pp. 17–27, 2016, doi: 10.1080/87567555.2016.1222575.
[36] B. J. Zimmerman, "Becoming a self-regulated learner: An overview," *Theory Into Practice*, vol. 41, no. 2, pp. 64–70, 2002, doi: 10.1207/s15430421tip4102_2.
[37] D. A. Schön, *The Reflective Practitioner: How Professionals Think in Action*. New York, NY: Basic Books, 1983.
[38] A. C. Ornstein and F. P. Hunkins, *Curriculum: Foundations, Principles, and Issues*, 7th ed. Boston, MA: Pearson, 2018.
[39] W. S. Lu, "Backward Design: An Approach to the Professional Development of School Leaders," *Innovare Journal of Education*, vol. 11, no. 3, pp. 40–47, May 2023, doi: 10.22159/ijoe.2023v11i3.48013.

Author



Mojahed Mousa is a dedicated faculty member at Al-Quds Bard College, affiliated with Al-Quds University in Palestine. He is actively involved in the Master of Arts in Teaching (MAT) program, where he teaches courses that integrate pedagogical theory with practical applications in classroom settings. His academic background and professional expertise are rooted in advancing effective teaching methodologies, with a particular focus on educational technology and assessment practices. His research interests include the integration of technology in teaching and learning, formative and summative assessment, and teacher professional development. (email: mojahed.mousa@staff.alquds.edu).