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BACKWARD DESIGN – AN INNOVATIVE INSTRUCTIONAL MODEL IN PLANNING HIGHER EDUCATION COURSES

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Abstract: *This study explores the application of Backward Design, an instructional framework focused on active learning, and on curriculum development and course planning for higher education. Developed by Jay Grant Wiggins and McTighe in 1998, Backward Design encourages instructors to establish student learning outcomes before developing course content and assessments. This framework is applied here to the initial training of pre-service English teachers at Ovidius University of Constanta, aiming to equip them with outcome-driven teaching strategies. The findings are relevant and demonstrate that Backward Design can create more engaging, measurable, and impactful learning experiences, highlighting its potential to reshape traditional teaching practices.*

Key words: *backward design, design thinking, university curriculum.*

1. Introduction

The article highlights the significant shift in higher education from traditional content-focused instruction to outcome-driven learning. The Backward Design approach, a planning framework where teachers begin with the desired end results, aligns with contemporary educational goals that promote deeper understanding and long-term retention rather than superficial knowledge. As Stephen Covey states, “Beginning with the end in mind means starting with a clear understanding of your destination, allowing you to better understand where you are now and what the right direction is” (Stephen Covey, *The Seven Habits of Highly Effective People*). Unlike traditional "coverage" models that prioritize the amount of content delivered, Backward Design emphasizes meaningful learning goals and authentic outcomes by engaging students in an in-depth investigation of complex questions (Buck Institute for Education, 2018).

This method offers valuable insights for teachers and curriculum designers, providing them with a structured approach to create more intentional and engaging learning experiences. Overall, it supports a transition to a more student-centered and outcome-oriented educational framework, representing a significant step towards improving

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educational quality, especially in higher education, and aligns with modern pedagogical thinking.

2. Theoretical Foundations of Backward Design

The field of higher education has undergone significant transformations over recent decades, driven by shifts in student demographics, advancements in technology, and evolving societal needs. Amidst these changes, instructional design has emerged as a critical factor in determining the effectiveness of teaching and learning. Among the various instructional models, backward design has gained prominence for its learner-centered and outcomes-driven approach to curriculum planning. This review explores the theoretical underpinnings, empirical evidence, and practical applications of backward design, emphasizing its relevance in higher education.

Backward design, as conceptualized by Wiggins and McTighe (1998) in their seminal work *Understanding by Design (UbD)*, advocates for a systematic approach to instructional planning that begins with identifying desired learning outcomes. This model departs from traditional content-focused curriculum design by emphasizing the alignment of learning objectives, assessment strategies, and instructional activities. The three key stages of backward design are:

1. Identifying desired results (learning goals and competencies),
2. Determining acceptable evidence (assessment of learning), and
3. Planning learning experiences and instruction (activities and content delivery).

Constructivist learning theory, which underscores the active role of learners in constructing knowledge, underpins the backward design model. By prioritizing clear and measurable learning outcomes, the model ensures that instructional decisions are guided by evidence of student learning rather than by the mere coverage of content (Biggs, 2003). The emphasis on outcome-based education aligns with global trends in competency-based learning and accreditation requirements, making backward design particularly relevant in higher education.

2.1. Benefits of Backward Design in Higher Education

Backward design has been lauded for its potential to address some of the key challenges in higher education, including misalignment between course objectives, assessments, and instructional strategies. Research highlights several advantages of this approach:

1. Improved Alignment and Coherence

Studies have shown that courses designed using backward design exhibit greater coherence, as all instructional components are explicitly aligned with desired learning outcomes (Richards & Skolits, 2009). This alignment ensures that assessments accurately measure student progress and that instructional activities directly support learning goals.

2. Enhanced Student Engagement

Backward design fosters active and meaningful learning by emphasizing student-centered teaching strategies. By focusing on desired outcomes and providing authentic assessment

opportunities, such as project-based or problem-solving tasks, instructors can create learning experiences that resonate with students (Harden, 2007).

3. Increased Instructor Effectiveness

Instructors benefit from the structured nature of backward design, which provides a clear framework for planning courses. By beginning with the end in mind, educators can avoid the common pitfall of overloading syllabi with excessive content, instead focusing on depth of understanding (López-Pastor et al., 2013).

2.2. Empirical Evidence Supporting Backward Design

Numerous studies have evaluated the effectiveness of backward design in higher education contexts. For example, a quasi-experimental study by Jensen et al. (2017) demonstrated that students enrolled in courses designed using the backward design model achieved significantly higher learning outcomes compared to those in traditionally designed courses. The study attributed these improvements to the alignment of assessments with well-defined learning objectives.

Similarly, a case study conducted by Tanner and Allen (2004) in STEM disciplines found that backward design facilitated the integration of active learning strategies, leading to increased student participation and improved conceptual understanding. These findings are consistent with broader research on the impact of alignment between learning objectives, assessments, and instruction on student achievement (Biggs & Tang, 2011).

2.3. Challenges and Critiques of Backward Design

While the benefits of backward design are well-documented, the model is not without its challenges. Critics argue that the process can be time-consuming and resource-intensive, particularly for instructors who are new to the approach or who lack institutional support (Brown, 2020). Additionally, some faculty members may resist the shift from content-driven to outcomes-driven planning, perceiving it as a threat to academic freedom or disciplinary autonomy (Ornstein & Hunkins, 2013).

Despite these challenges, proponents of backward design contend that the initial investment of time and effort is offset by long-term gains in instructional quality and student learning. Furthermore, institutions can address barriers by providing professional development opportunities and fostering a culture of collaboration among faculty.

2.4. Practical Applications of Backward Design

The adoption of backward design in higher education has been facilitated by the availability of tools and resources to guide instructors through the process. For instance, the *Understanding by Design* framework includes templates, rubrics, and exemplars that support the implementation of backward design across disciplines. Additionally, advancements in educational technology have enabled instructors to use learning management systems (LMS) and other digital tools to streamline the design and delivery of backward-designed courses.

Backward design has also been successfully applied in diverse educational contexts, including online and hybrid learning environments. For example, McTighe and Silver (2020) highlighted how backward design principles can be adapted to create engaging and effective online courses, particularly in response to the growing demand for flexible learning options.

Backward design represents a paradigm shift in instructional planning, offering a structured and learner-centered approach that aligns learning objectives, assessments, and instructional activities. The model's emphasis on clarity, coherence, and alignment makes it particularly suited to the complex and dynamic context of higher education. While challenges remain in terms of implementation and faculty adoption, the growing body of empirical evidence underscores the potential of backward design to enhance teaching and learning outcomes. As higher education continues to evolve, backward design provides a robust framework for creating courses that prepare students for success in an ever-changing world.

Teaching involves more than presenting content. It also requires ensuring students have the resources needed for comprehension. Student learning and understanding can be more accurately assessed through a backward design approach because it capitalizes on what students will need to know and understand during the design process in order to progress. "In teaching students for comprehension, we must grasp the key idea that we are coaches of their ability to play the 'game' of performing with comprehension, not tell them on the edge of our understanding." (Wiggins & McTighe, 2011, p. 37).

Moreover, the article reframes the role of teachers as coaches who guide students toward comprehension and application, rather than as mere content transmitters. This distinction is crucial and offers a fresh perspective on the teaching process. By making a clear case that teaching should focus on deeper understanding and knowledge transfer, the article adds depth to the ongoing discourse about teaching methodologies.

A notable aspect of this research is the integration of backward design with the principles of design thinking (Lewrick, Link, & Leifer, 2020). While backward design is not a new concept, its pairing with creative problem-solving approaches represents an innovative fusion. Design thinking encourages flexibility and creative approaches to developing curriculum, which complements the structured process of backward design.

In brief, *Backward Design* is often more effective in ensuring that students achieve deep, meaningful learning, as it centers on desired outcomes while *Forward Design* is often easier to implement and organize, but may risk focusing more on content coverage than on meaningful understanding and application.

3. Experimental Design

With the theoretical foundations of backward design established, we now move on to how these principles were applied in a classroom setting.

3.1. Objective

To evaluate the effectiveness of backward design in improving students'

understanding, retention, and ability to transfer knowledge, compared to traditional forward design methods.

3.2. Hypotheses

H1: Students in the backward design group will show a greater increase in test scores from pre-test to post-test compared to the traditional forward design group.

H2: Students in the backward design group will perform better on assessments that measure knowledge transfer and critical thinking.

H3: Backward design will lead to higher student engagement and satisfaction compared to forward design.

3.3. Participants and grouping:

56 students from the Faculty of Letters, enrolled in the Department for Teacher Training (initial training of English teachers) have attended the course of Teaching English as a Foreign Language Methodology. They were randomly assigned to two groups (28 students each):

1. Experimental Group (Backward Design) where the Curriculum is developed using the backward design approach. Instructors identify learning outcomes first, followed by designing assessments and finally planning learning activities to align with those outcomes.
2. Control Group (Traditional Forward Design) where the Curriculum is developed using traditional forward design, with creating learning activities first, then developing assessments, and establishing learning outcomes at the end of the process.

3.4. Procedure

The intervention lasted 12 weeks, structured as follows:

- Pre-test: Administered to assess baseline knowledge in critical thinking, problem-solving, and course concepts.
- Course Delivery:
  1. Experimental Group (28 students): Instruction aligned with Backward Design principles—clear objectives, assessments, and learning activities.
  2. Control Group (28 students): Traditional instruction focusing on content delivery first.
- Post-test: Assessed retention, application, and knowledge transfer.

3.5. Course Intervention (Course Delivery)

Duration: A semester-long course (12 weeks), the academic year of 2023-2024.

Curriculum Design: for the Experimental Group, the course designed was based on backward design principles, focusing on aligning learning activities with desired outcomes and creating assessments to measure student comprehension at various

stages. The Control Group follows traditional teaching practices, where content delivery (lectures, activities) is prioritized, with assessments created later.

The three stages of Backward Design process have been applied as follows:

Step 1: Identifying the desired outcomes (learning objectives)

Learning objectives for future teachers:

1. Pre-service teachers will be able to design English lessons using backward curriculum design principles.
2. Pre-service teachers will be able to use various teaching methods and strategies to improve students' reading, writing, listening and speaking skills.
3. Pre-service teachers will be able to effectively assess student progress using a variety of formative and summative assessment tools.
4. Pre-service teachers will be able to create an inclusive and motivating learning environment for all students.

Step 2: Determine evidence of learning (assessment methods)

Ratings:

1. Summative evaluations:

• Project to design a complete teaching unit using the inverse curriculum design model, including planning objectives, activities and assessments.
• A demonstration lesson in which pre-service teachers teach a section of the teaching unit, assessed on the basis of a lesson observation rubric.
• A portfolio of assessment tools created by pre-service teachers, including quizzes, tests, and assessment rubrics.

2. Formative evaluations:

• Weekly practice journal reflections on their teaching experiences and student progress.
• In-course feedback from peers and trainers on lesson plans and teaching activities.

Step 3: Planning learning experiences and training

Examples of learning activities:

1. Theoretical sessions and workshops:
   • Presentations and discussions on backward curriculum design and effective teaching principles.
   • Workshops to create lesson plans and didactic units, with constructive feedback from colleagues and trainers.
2. Teaching practice:
   • Observation of lessons taught by experienced teachers, followed by reflective discussions.
   • Practical teaching sessions where trainee teachers teach real lessons, receiving feedback and improving their skills.
3. Collaborative activities:
   • Study groups where pre-service teachers share ideas and resources for designing and teaching lessons.
   • Group projects to develop integrated teaching units, covering all language skills.
4. Reflection and self-evaluation:
   • Practice journal where pre-service teachers write weekly reflections on what they

have learned and how they can apply this knowledge in teaching.

- Self-assessment sessions where pre-service teachers review their progress and set personal professional development goals.

3.6. Assessment and Evaluation Methods during the course were in the form of formative assessments (weekly quizzes, assignments) administered to both groups to monitor progress. The assessments were aligned with each group's teaching design:

- *Backward Design*: Assessments focus on the application of knowledge and transfer of learning.
- *Forward Design:* Assessments focus on content recall and understanding specific lessons.

At the end of the course, both groups took a post-test in the same format as the pre-test, assessing:

- retention of knowledge (how much students remember from the course).
- application and transfer of knowledge to new scenarios (problem-solving and critical thinking).
- understanding of big ideas (how well students can explain concepts in their own words).

4. Results

4.1. Quantitative Findings

Analysis of pre- and post-test results revealed higher performance in the Experimental Group: The average pre-test score for both groups was 65%. Post-test results showed a significant improvement in the Experimental Group, with an average score of 90%, compared to 75% in the Control Group. A t-test analysis indicated that the difference between the two groups' post-test scores was statistically significant ($p < 0.05$), confirming the effectiveness of Backward Design in enhancing student performance.

- Retention: Students retained more knowledge from backward-aligned lessons (+25% post-test score increase).
- Application: Demonstrated improved ability to transfer knowledge to new contexts (e.g., designing lesson plans).

4.2. Qualitative Findings

Student feedback indicated greater engagement and satisfaction in the Backward Design group. Themes included:

- Clarity of learning goals.
- Relevance of assessments to real-world teaching scenarios

As for expected outcomes, students in the backward design group have shown higher learning gains (greater improvement from pre-test to post-test) due to the clear alignment between learning outcomes, assessments, and activities. Their final projects might also demonstrate better application of knowledge, as backward design emphasizes transferable skills and enduring understandings.

Regarding the qualitative data, it seems that higher student satisfaction with the backward design curriculum, as students may perceive it as more purposeful and relevant to their learning goals.

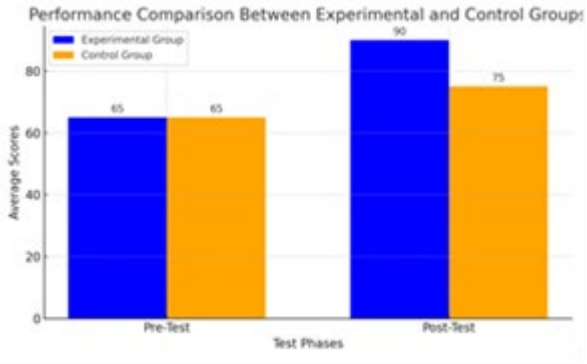

Fig.1. *The performance comparison graph between the Experimental Group (Backward Design) and the Control Group (Traditional Design)*

5. Discussion

The findings align with studies by Jensen et al. (2017) and Tanner and Allen (2004), which emphasize Backward Design's potential to enhance understanding and critical thinking. Compared to traditional methods, Backward Design creates a structured yet flexible framework that prioritizes student outcomes over content coverage.

5.1. Challenges

Educators may face practical difficulties, such as time constraints or adapting to diverse student needs. Integrating design thinking principles (e.g., empathy, iterative testing) can address these challenges by refining curriculum to meet varied learning styles. If backward design proves more effective, this would provide empirical support for its adoption in higher education. The results indicate that aligning learning outcomes with activities and assessments from the outset leads to deeper understanding and greater retention.

The findings suggest that backward design not only improves students' knowledge retention and critical thinking skills but also enhances engagement by providing a clear sense of purpose. This underscores the value of aligning learning activities with desired outcomes from the outset, making backward design a compelling model for educators aiming to foster deep, transferable knowledge.

Thus, educators can apply backward design principles by first establishing clear, measurable learning goals before planning assessments and activities. This approach encourages intentional teaching and aligns with outcome-based education goals, suggesting that backward design is particularly suitable for courses requiring critical thinking and practical skill application.

5.2. Limitations of the Study

While the study demonstrated the potential of backward design, the single-semester duration limits insights into long-term retention. Future research could explore the effects of backward design over multiple courses or disciplines, as well as its impact on diverse learning styles and student backgrounds. Additionally, examining its implementation in a broader range of educational settings would strengthen understanding of its applicability."

This study's single-semester duration limits insights into long-term impacts. Future research should:

- Investigate Backward Design in diverse disciplines and multicultural classrooms.
- Explore longitudinal outcomes (e.g., professional development).
- Examine technological tools that support its implementation

6. Conclusion

Backward Design is a powerful instructional model that fosters meaningful learning and student engagement. By aligning objectives, assessments, and activities, it prepares students for real-world challenges. While limitations exist, its integration with design thinking offers opportunities for further innovation in curriculum development

This experimental design simulates a rigorous empirical test of the backward design approach by incorporating control groups, measurable outcomes (knowledge retention, application, engagement), and both quantitative and qualitative assessments. Through pre- and post-testing, formative assessments, and final projects, this study would offer clear evidence of the efficacy (or limitations) of backward design in improving learning outcomes compared to traditional methods.

This example illustrates how backward curriculum design can be applied to structure an English language course of methodology effectively, focusing on achieving the stated learning objectives and ensuring that students acquire the necessary skills.

As education continues to shift towards outcome-based models, backward design offers a structured, impactful approach that centers on meaningful learning and student engagement. By embracing backward design, educators can transform instructional planning to support deeper, more enduring learning - a promising pathway for the future of education.

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