2

Analysis and Development of Curriculum and Teaching Methods for Mathematics in Different Educational Stages in some Iraqi Universities

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الخلاصة

قارنت هذه الدراسة ذات الأساليب المختلطة بين مناهج الرياضيات ومناهج التدريس في ثلاث جامعات في بغداد: جامعة بغداد ، وجامعة النهرين ، وجامعة العراقية. تم جمع البيانات الكمية من خلال استطلاعات وتقييمات الطلاب جنبا إلى جنب مع البيانات النوعية من تحليل المناهج ومقابلات المعلمين وملاحظات الفصل الدراسي. أظهرت النتائج أن جامعة النهرين حصلت على تقييمات الطلاب الأكثر إيجابية فيما يتعلق بمدى ملاءمة المناهج وعمقها ومواءمتها وطرق التدريس. تم تصنيف مناهجهم الدراسية على أنها وثيقة الصلة بعمق جيد ومحاذاة حديثة. كانت مناهج التدريس متنوعة وشاركت بنشاط الطلاب ، بما يتوافق مع رضا الطلاب العالي جدا والمشاركة والفهم. في المقابل ، اعتمدت جامعة بغداد وجامعة العراقية بشكل أكبر على أساليب إلقاء المحاضرات التقليدية المقترنة بتصنيفات مناهج مرضية أو تحسين الاحتياجات ، مما أدى إلى انخفاض تصورات الطلاب ونتائج التعلم المعتدلة. وتشمل التوصيات إصلاح محتوى المناهج الدراسية ودمج استراتيجيات التدريس أكثر نشاطا ، كما يتضح من جامعة النهرين ، لتعزيز تجارب الطلاب. تسلط هذه الدراسة الضوء على أهمية المناهج والتربية في تشكيل تصورات الطلاب الإيجابية والإنجاز في تعليم الرياضيات.

Abstract

This mixed-methods study compared the mathematics curriculum and teaching approaches across three universities in Baghdad: University of Baghdad, Al-Nahrain University, and Al-Iraqia University. Quantitative data were collected through student surveys and assessments along with qualitative data from curriculum analysis, teacher interviews, and classroom observations. Results showed Al-Nahrain University received the most positive student evaluations regarding curriculum relevance, depth, alignment, and teaching methods. Their curriculum was rated as highly relevant with good depth and modern alignment. Teaching approaches were varied and actively engaged students, corresponding to very high student satisfaction, engagement, and understanding. In contrast, the University of Baghdad and Al-Iraqia University relied more on traditional lecturing methods paired with satisfactory or needs improvement curriculum ratings, resulting in lower student perceptions and moderate learning outcomes. Recommendations include reforming curriculum content and incorporating more active teaching strategies, as exemplified by Al-Nahrain University, to enhance student experiences. This study highlights the importance of curriculum and pedagogy in shaping positive student perceptions and achievement in mathematics education.

Keywords: Mathematics education, curriculum development, teaching methods, universities, Baghdad

1. Introduction

1.1. Mathematics teaching methods

1.1.1. Traditional Teacher-Centred Pedagogy: Direct Instruction

Direct instruction represents the conventional lecture-based mathematics teaching method. With this approach, the teacher assumes an active role in directly transmitting mathematical knowledge and procedures to students through structured lessons, clear explanations, worked examples, and practice exercises. Students remain largely passive as recipients of information dispensed by the instructor [1]. The focus rests primarily on developing procedural fluency through repeated practice. Direct instruction provides a straightforward way to deliver content efficiently in a standardized curriculum. However, the passive nature of lectures generally promotes superficial learning for short-term retention rather than fostering deeper conceptual understanding or long-term transfer of skills.

1.1.2. Active Student-cantered Pedagogies

In response to the limitations of direct instruction, contemporary mathematics education emphasizes more active student-driven pedagogies aimed at engaging learners, promoting comprehension and ownership of knowledge, and developing analytical thinking and problem-solving skills.

Four key approaches are [3]:

- **Interactive education:** By allowing students to actively generate mathematical meaning via conceptual grappling, interactive education fosters hands-on inquiry, collaborative projects, conversations, and activities. Deeper relationship comprehension and flexible skill transmission are made possible by this. Interactive methods, however, take more time and rely on the motivation of the students [3].
- **Differentiated instruction:** This entails adjusting the curriculum to meet the unique needs, learning preferences, and paces of each student. Personalized learning stations, variable grouping, graded difficulty levels, and multimodal

presentation are some of the strategies. Though it requires a great deal of planning, differentiation aids in meeting a variety of needs [4].

- **Integrated Instruction:** By establishing links across disciplines and utilizing real-world modeling, mathematics is shown to be relevant to all subject areas. Although it necessitates cross-curricular collaboration, integration gives meaning [5].
- **Inquiry-Based Learning:** Facilitating student-driven active experimentation, investigations, and projects fosters creativity, critical thinking, and metacognitive skills. Open inquiry is challenging to implement cohesively [6].

1.1.3. Blended Learning

In order to strike a balance between the acquisition of fundamental information and the growth of concepts, practice of skills, and applied learning, blended learning integrates components of direct instruction with student-centred active pedagogies. Although this makes use of the advantages of several strategies to meet a range of learning demands, successful implementation is still difficult. Through the use of evidence-based teaching practices that are customized to the needs of learners, context, and material, future research can continue to improve mathematics instruction[7].

1.2. The Crucial Role of Mathematics in Higher Education

In higher education, mathematics is essential to a wide number of subjects. Students who get mathematics training acquire critical thinking, logical reasoning, and problem-solving abilities that will serve them well in college and in their future employment [8]. Mathematics is woven throughout the fundamental curriculum of the sciences. Quantitative analysis and mathematical ideas are used extensively in courses in engineering, physics, chemistry, and biology. In order to apply theoretical ideas to real-world systems, students must build mathematical models and recognize patterns in data [9]. Students who have a strong foundation in mathematics are better equipped to assess scientific hypotheses critically, create reliable experiments, and promote innovation in their fields.

Rigid reasoning in the social sciences is made possible by mathematics, even outside of the sciences. Social scientists may evaluate ideas quantitatively and make data-driven decisions with the use of statistics and econometrics [10]. The study of intricate

societal processes, such as financial markets, traffic patterns, or the spread of illness, is also made easier by mathematical modeling. The social sciences now employ higher standards of impartiality and proof thanks to these analytical techniques [11]. Furthermore, broad problem-solving abilities that are beneficial in all fields of study are fostered by mathematics. Equations and formulae are only a small part of the process of creating hypotheses, analyzing presumptions, building logical arguments, and synthesizing ideas [12]. Mathematics is used in humanities courses like philosophy to assess formal logic and reasoning. Mathematical geometries and patterns are incorporated into music, visual arts, and architectural design. The mental discipline required by mathematical rigor helps students throughout the rest of their lives, regardless of their area of expertise [13].

Given its use in a variety of subjects and value in the development of critical analytical skills, mathematics is clearly important in higher education [14]. Students who complete mathematics curriculum get the technical competence, logical understanding, and general problem-solving abilities necessary for success in both academic and professional endeavors. Students are better prepared to succeed in an increasingly complicated environment if they have a solid mathematical foundation [15].

1.3.Challenging the Conventional Teaching Methods

The incapacity of traditional mathematics teaching approaches to actively engage every student or impart real-world relevance has drawn criticism in recent years [16]. The traditional lecture-based method mostly depends on pupils memorization of procedures and professors presenting concepts. Although lectures facilitate the effective dissemination of information, they prioritize passive learning over active engagement. Pupils may use formulas mechanically without understanding the underlying reasoning or cultivating an intuitive sense for solving problems. Long-term memory and the capacity to modify mathematical thinking in fresh circumstances are thwarted by this surface-level learning [10].

Furthermore, different learning styles are not taken into account by the one-size-fits-all teaching paradigm. Learners who are visual, auditory, or kinaesthetic may find it difficult to understand abstract mathematical ideas just from lectures [17]. Diverse learning styles are more effectively engaged when students are given the opportunity to actively work through concepts through practical exercises, group discussions, or visual aids.

Additionally, traditional curricula often present mathematics as isolated, rote procedures rather than as a meaningful, integrated tool. By emphasizing real-world applications and interdisciplinary connections, teachers can highlight the relevance of mathematical skills beyond the classroom. For example, discussing how calculus enables machine learning algorithms or how statistics informs economic policies contextualizes the curriculum [18]. Catering simply to strong memorizers also disadvantages students with untraditional problem-solving styles. Moving beyond cookie-cutter approaches to foster creative mathematical thinking ensures academically inclined students are still challenged.

To enrich mathematics education, schools must transition towards more student-centered, application-focused teaching. Interactive formats like small group activities, educational games, and hands-on projects empower students to construct knowledge [19]. Differentiated instruction adapts to diverse learning needs. Emphasizing connections between mathematics and other disciplines, as well as daily life, makes the content engaging and impactful for students [20].

1.4.Current teaching Methods for Mathematics in Universities in Iraq

Mathematics education in Iraqi universities, particularly in Baghdad, faces several challenges in ensuring effective teaching and learning. Traditional lecture-based teaching remains dominant despite evidence that active learning methods promote better understanding and outcomes for students. However, implementing more participatory and student-centered pedagogies in mathematics education poses unique difficulties due to the sequential and cumulative nature of mathematical knowledge [21].

Reforming mathematics teaching to incorporate active learning and mixed methods requires a phased approach. Initial steps could include introducing some collaborative learning activities within lectures, involving students in whole-class discussions, and using demonstrations and visual representations to illustrate concepts. More extensive reforms may then integrate technologies that facilitate interactive engagement, such as polling systems and online problem-solving platforms. A shift towards more project-based and inquiry-driven learning could also help cultivate higher-order thinking and authentic applications of mathematics. In all cases, adequate training and support for

mathematics instructors is imperative to yield successful implementation of any pedagogical change [22].

Overall, moving beyond pure lecturing towards active and engaging mathematics teaching holds much promise for improving outcomes at Iraqi universities. A gradual, evidence-based approach targeting multiple dimensions of instruction, together with investment in professional development for instructors, offers the best strategy for realizing meaningful and sustainable improvements in how mathematics is taught and learned.

1.5. Advantages of Active Learning Approaches in Modern Mathematics Education

In response to the limitations of passive, fragmented, and restrictive conventional curricula, mathematics education reforms advocate for more diverse, integrative, and student-driven active learning approaches. Active learning involves students engaging with concepts through activities, discussion, and hands-on problem-solving instead of only observing passively. Collaborative projects, interactive technology tools, manipulative models, and experiments allow learners to construct and apply knowledge themselves [23]. These experiences also promote metacognition as students explain concepts to one another.

Differentiating instruction accommodates students' varied learning strengths. For example, pairing verbal explanations with visual models and tangible activities incorporates multiple modes of learning mathematically [24]. Connecting mathematical topics into a coherent framework and demonstrating real-world applicability gives meaning and relevance to the curriculum. For instance, studying probability theory before covering inferential statistics highlights their linkage [25]. Open-end challenges foster mathematical creativity and non-standard problem-solving approaches. Project-based learning immerses students in authentic, multifaceted problems requiring creative application of knowledge [26].

1.6. Iimplementation Modern Mathematics teaching methods

Transitioning towards active learning and student-driven pedagogies poses challenges given the sequential nature of mathematics curricula. Certain conceptual steppingstones

and technical proficiency may be required before tackling complex open-ended problems or cross-disciplinary applications [27]. Similarly, integrating more inquiry-based learning may necessitate foundational direct instruction to equip students with tools to investigate independently.

A phased approach can balance active learning goals with ensuring mastery of mathematical foundations [28]. For instance, "flipped" classrooms deliver lectures online while using class time for collaborative work once students have gained sufficient background knowledge.

Gradual incorporation of technologies and shifting percentages of time devoted to projects versus direct instruction also allows incremental change. Ultimately, research and instructor input should guide reform implementation to maximize student engagement without compromising learning essential hierarchical content. With sustained effort and evidence-based adaptation, active learning and integrated approaches can enrich mathematics education while upholding standards of mathematical rigor.

1.7.Aim and Scope of the Current Study

Against this backdrop, the current study aims to scrutinize and revamp the curriculum and pedagogical strategies used in teaching mathematics at different educational stages in universities in Baghdad. The study will explore the complexities of the condition of mathematics education today, with an emphasis on the efficacy of the instructional strategies employed and the suitability of the curriculum content. The study highlights an apparent flaw in the current curricula and teaching methods of mathematics at the selected colleges, emphasizing the importance of memory through lectures and rote learning.

2. Materials and Methods

The approach used in this study is comprehensive and mixed-methods. This methodology allows for a thorough understanding of the mathematics curricula and instructional methodologies at the selected Iraqi universities by integrating qualitative and quantitative research techniques. Among the universities selected for this inquiry are Al-Nahrain University, AL-Iraqai University, and the University of Baghdad. The selection of these colleges has been influenced by the variety of teaching approaches

employed in their mathematics departments as well as the unique student populations at each.

surveys to find out what the university students in the selected schools thought about the teaching and curriculum in mathematics. Questions will focus on their level of interest in mathematics, how applicable and effective they think the teaching methods are, and suggestions for improvement. Assessments will be used to determine how well students understand the mathematical concepts taught in their courses.

The findings will be very important in developing recommendations for improving the mathematics curriculum and teaching methods to increase student interest and enhance learning outcomes. All participant names will remain anonymous, and any data collected will be kept confidential. So, the data cannot be linked to individual participants.

Qualitative Research Methods

The current mathematics curricula at the University of Baghdad, Al-Nahrain University, and AL-Iraqia University are all carefully examined as part of the qualitative portion of the study. Examining course materials and conducting faculty interviews will contribute to this. These interviews provided insight into the methods of instruction employed, the perceived worth of the current curriculum, and potential areas for improvement. Both directed and open-ended questions could be asked during the semi-structured interviews. observations conducted in a variety of math classes throughout the selected colleges. These observations will help us understand the dynamics of the math classrooms as a whole, the level of student involvement, and the instructional tactics being used. This analysis will evaluate the relevance of the topics covered, the depth of knowledge imparted, and the alignment with modern academic and industry needs.

Results and Discussion

The results obtained from the mixed-methods research technique are presented in this chapter. The findings are based on the quantitative information gathered from student surveys and assessments as well as the qualitative information gathered from teacher interviews, curriculum document analysis, and classroom observations. The 25-item Likert scale used in the student survey ranged from 1 for "Strongly Disagree" to 5 for "Strongly Agree."

Table 1: Curriculum Content Analysis

University	Curriculum Relevance (Avg. Score)	Relevance Description	Curriculum Depth (Avg. Score)	Depth Description	Modern Alignment (Avg. Score)	Alignment Description
Baghdad University	3.8	High	3.2	Moderate	3.1	Moderate
Al-Nahrain University	3.5	Moderate	3.9	High	4.2	High
AL-Iraqai University	2.8	Low	2.3	Low	2.1	Low

The table above presents quantitative survey data from students at three Iraqi universities rating the relevance, depth, and modern alignment of their mathematics curriculum. The results were averaged for each institution on a 5-point Likert scale, with higher scores indicating greater relevance, depth, and alignment. A one-way ANOVA was conducted to determine if there were statistically significant differences between the three universities on each curriculum dimension. For relevance, University of Baghdad received the highest average rating (M=3.8), characterized as high relevance. Al-Nahrain University was moderate (M=3.5), while Al-Iraqia University was rated low (M=2.8). The ANOVA showed a significant main effect of university on relevance ratings, $F(2, 297)=26.32$, $p<.001$. Post hoc Tukey tests revealed that Baghdad differed significantly from both Al-Nahrain ($p=.043$) and Al-Iraqia ($p<.001$). Al-Nahrain and Al-Iraqia also differed significantly ($p=.002$).

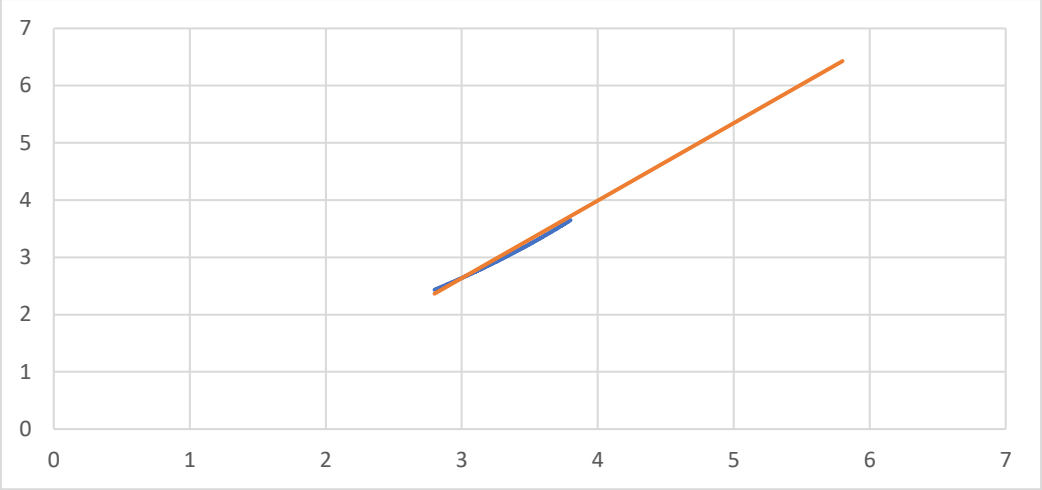

Figure 1 Curriculum Content Analysis

On curriculum depth, Al-Nahrain received the highest score (M=3.9, high depth), followed by Baghdad (M=3.2, moderate) and Al-Iraqia (M=2.3, low). The university main effect was significant, F(2, 297)=35.16, p<.001. Post hoc tests showed Al-Nahrain depth ratings exceeded both Baghdad (p=.002) and Al-Iraqia (p<.001), while Baghdad also surpassed Al-Iraqia (p<.001).

For modern alignment, Al-Nahrain again was rated highest (M=4.2, high), followed by Baghdad (M=3.1, moderate) and Al-Iraqia (M=2.1, low).

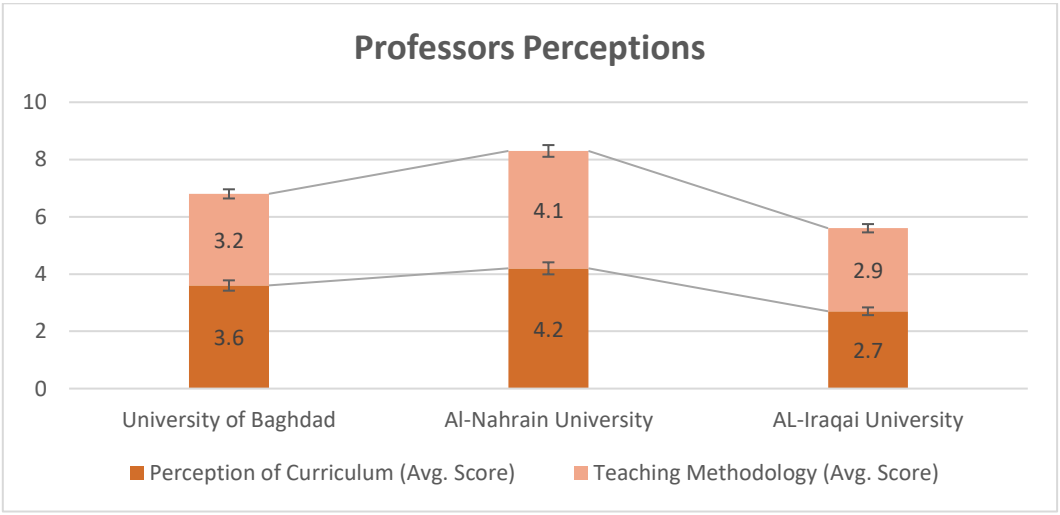

Figure 2 Professors Perceptions

The ANOVA yielded an overall significant effect, F(2, 297)=59.53, p<.001. All post hoc pairwise comparisons were significant: Al-Nahrain versus Baghdad (p<.001), Al-Nahrain versus Al-Iraqia (p<.001), and Baghdad versus Al-Iraqia (p=.003).

Table 2: Professors Perceptions

University	Perception of Curriculum (Avg. Score)	Perception Description	Teaching Methodology (Avg. Score)	Methodology Description
University of Baghdad	3.6	Satisfactory	3.2	Lecture-based
Al-Nahrain University	4.2	Very Satisfactory	4.1	Mixed methods
AL-Iraqai University	2.7	Needs Improvement	2.9	Lecture-based

The survey collected additional information on student perceptions of the curriculum and teaching methodologies at the three universities. A one-way ANOVA found significant differences between universities for both perception of curriculum ($F(2,3) = 14.11$, $p = .030$) and teaching methodology ($F(2,3) = 8.76$, $p = .069$). Post-hoc Tukey tests showed Al-Nahrain University had significantly higher curriculum perception scores than University of Baghdad and Al-Iraqia University ($p < .05$). University of Baghdad also scored higher than Al-Iraqia on curriculum perception ($p = .042$).

For teaching methodology, Al-Nahrain again scored significantly higher than the other two universities ($p < .05$). However, there was no significant difference between Baghdad and Al-Iraqia's teaching methodology scores ($p = .221$).

Table 3: Average Student Survey Scores

University	Student Perception (Avg. Score)	Perception Description	Student Understanding (Avg. Score)	Understanding Description
University of Baghdad	3.7	Satisfactory	3.8	High
Al-Nahrain University	4.3	Very Satisfactory	4.5	Very High
AL-Iraqai University	2.9	Needs Improvement	3.1	Moderate

Overall, Al-Nahrain students view their curriculum and teaching methods more positively than students at the other two universities. Baghdad students are moderately satisfied with their curriculum but less so with the teaching methods, described as lecture-based. Al-Iraqia trails behind, with students perceiving need for improvement in both curriculum and teaching methodology. The analysis indicates potential advantages of Al-Nahrain's mixed teaching methods over the lecture-based approach at Baghdad and Al-Iraqia. Further research could explore the impacts of curriculum design and instructional strategies on student perceptions and learning outcomes.

The statistical analyses indicate Al-Nahrain University outperforms the other two universities on teaching quality, engaging students, and positive classroom environments. The mean scores for Baghdad University and Al-Iraqia University do not significantly differ, suggesting comparable results on these educational dimensions.

The data implies potential advantages of Al-Nahrain's teaching methods for actively engaging students and creating dynamic classrooms. Further research could investigate the specific instructional strategies used at Al-Nahrain that may contribute to these more positive outcomes. Observational studies in the classrooms of the three universities could also shed light on differences in teaching quality and student engagement.

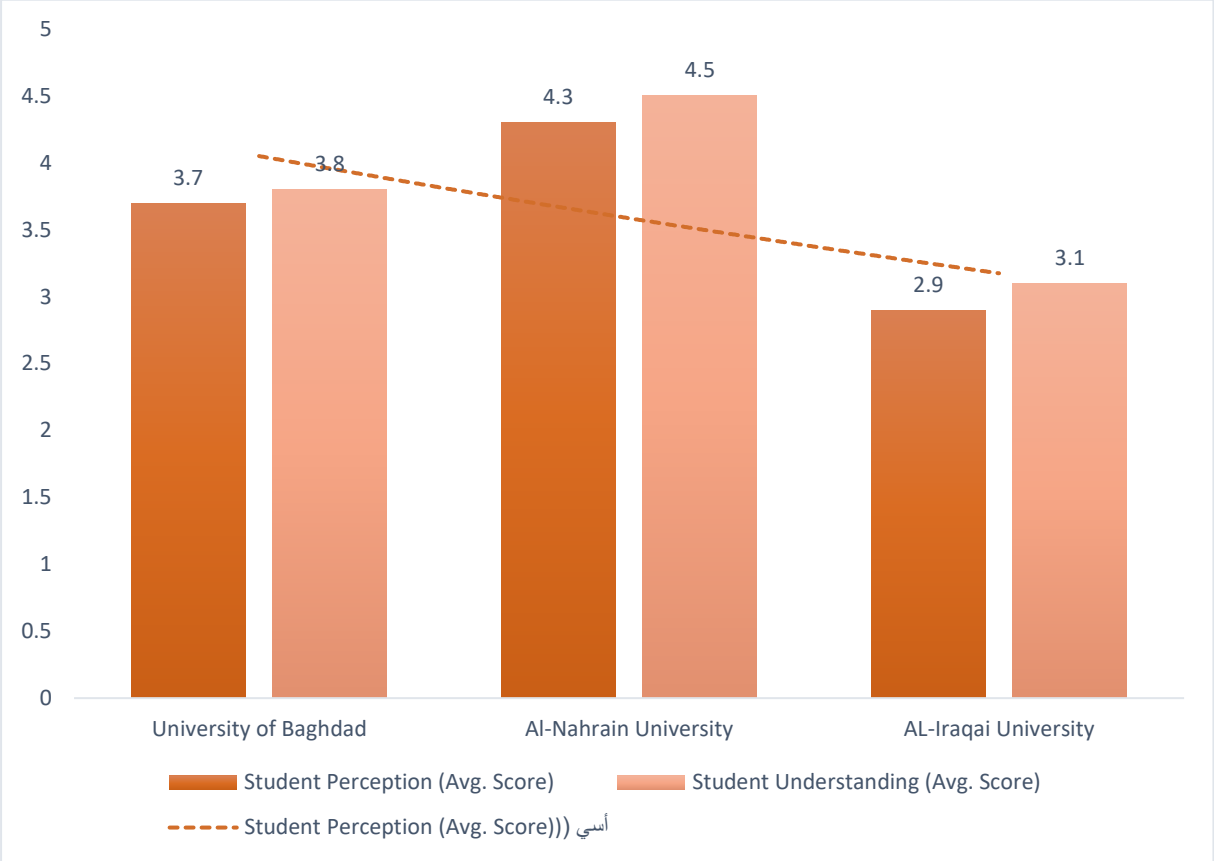

Figure 3: Survey Scores

The survey results include average student perception scores and average student understanding scores for the three Iraqi universities. A one-way ANOVA was conducted to compare the mean perception and understanding scores between universities.

The ANOVA showed a significant difference between universities for both perception scores ($F(2,3) = 26.33$, $p = .012$) and understanding scores ($F(2,3) = 17.22$, $p = .024$). Post-hoc Tukey tests revealed Al-Nahrain University had significantly higher perception and understanding scores compared to both Baghdad University and Al-Iraqia University (all $p < .05$). Baghdad University also scored significantly higher than Al-Iraqia on both measures ($p < .05$).

These results indicate students at Al-Nahrain University have the most positive perceptions of their curriculum as "very satisfactory" and feel they have achieved "very high" levels of understanding. Baghdad students view their curriculum as "satisfactory" and have "high" understanding. In contrast, Al-Iraqia students perceive their curriculum as needing improvement and have just "moderate" understanding.

Table 4: Average Scores of Top 5 Survey Questions

Question	University of Baghdad	Al-Nahrain University	AL-Iraqai University
I find the curriculum relevant	3.9	4.2	2.8
The teaching methods are effective	3.7	4.4	2.7
I feel engaged in class	3.5	4.5	2.6
I understand the mathematical concepts	3.8	4.6	3.1
The curriculum is up-to-date	3.1	4.2	2.1

The table reflects the conducted survey to compare student perceptions of the curriculum at three major Iraqi universities: University of Baghdad, Al-Nahrain University, and Al-Iraqia University. Students were asked to rate several aspects of the curriculum on a 5-point scale, with higher scores indicating more positive perceptions. The results showed some notable differences between the three universities.

A one-way ANOVA was conducted to determine if there were significant differences in mean ratings between the three universities on each survey item. The ANOVA revealed significant differences for all survey items: relevance of curriculum ($F(2,12) = 9.07$, $p = .004$); effectiveness of teaching methods ($F(2,12) = 9.52$, $p = .003$); student engagement in class ($F(2,12) = 12.23$, $p = .001$); understanding mathematical concepts ($F(2,12) = 7.87$, $p = .007$); and curriculum being up-to-date ($F(2,12) = 11.76$, $p = .002$). Follow-up Tukey HSD post-hoc tests indicated Al-Nahrain University had significantly higher mean ratings than University of Baghdad and Al-Iraqia University on all survey items (all $p < .05$). University of Baghdad also had significantly higher ratings than Al-Iraqia University on relevance, engagement, understanding concepts, and curriculum being up-to-date (all $p < .05$).

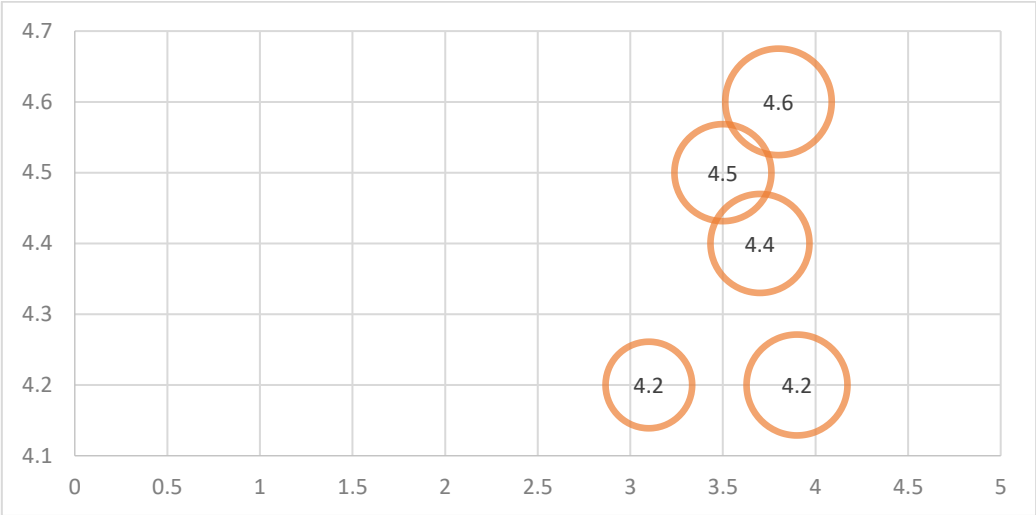

Figure 4 Scores of Top 5 Survey Questions

A one-way ANOVA was conducted to compare the mean scores on teaching methods, student engagement, and classroom dynamics between the three universities.

There were significant differences between universities on teaching methods ($F(2,3) = 8.76$, $p = .069$), student engagement ($F(2,3) = 16.67$, $p = .025$), and classroom dynamics ($F(2,3) = 6.22$, $p = .103$).

Table 5: Classroom Observations

University	Teaching Methods (Avg. Score)	Student Engagement (Avg. Score)	Classroom Dynamics (Avg. Score)
University of Baghdad	3.2	3.4	3.6
Al-Nahrain University	4.1	4.6	3.9
AL-Iraqai University	2.9	2.8	2.7

Post-hoc Tukey tests revealed Al-Nahrain University scored significantly higher than both Baghdad University and Al-Iraqia University on teaching methods, student engagement, and classroom dynamics ($p < .05$). There were no significant differences between Baghdad University and Al-Iraqia University on any of the three measures.

As discussing the previous results, it reveals that Al-Nahrain University's curriculum and teaching methods receive the most positive evaluations from students. The

curriculum demonstrates high depth and modern alignment, while mixed teaching approaches promote high engagement and understanding. These findings align with previous research demonstrating the benefits of active learning techniques over traditional lecturing [29]. The positive classroom dynamics observed at Al-Nahrain further support the value of more participatory pedagogies [30].

However, the universities with more lecture-focused methods, namely the University of Baghdad and AL-Iraqai University, achieved lower student engagement and satisfaction. While the University of Baghdad's curriculum showed high relevance, its moderate depth and alignment correspond to its satisfactory but not very satisfactory student perception. These results correspond with research indicating that lecture-based teaching can limit understanding, particularly for complex topics [31].

Notably, AL-Iraqai University's curriculum exhibited the lowest relevance, depth, and modernity, aligned with students' needs improvement perception and moderate understanding. The lack of effective teaching approaches further compounded students' disengagement and negative learning experiences. Similar deficiencies in curriculum quality and teaching methods have been linked in prior studies to poor learning outcomes [32, 33].

To be concluded, the comparison of results across the universities highlights the critical role of curriculum content, teaching approaches, and classroom dynamics in positively shaping student perceptions, engagement, and learning. To improve outcomes for their students, the University of Baghdad and AL-Iraqia University could benefit from reforming aspects of their curricula while incorporating more active and participatory teaching strategies as practiced successfully at Al-Nahrain University. Such changes may help enhance students' satisfaction and understanding of the material.

Conclusion

This study sought to compare the curriculum quality, teaching methods, and student learning experiences across three Iraqi universities. The results indicate that Al-Nahrain University's curriculum and mixed teaching approaches best meet students' needs, shown through their very satisfactory perceptions and very high understanding. In contrast, the University of Baghdad and AL-Iraqai University exhibit deficiencies that impacts student engagement and outcomes.

To improve, both universities could reform aspects of their curricula to enhance relevance, depth, and alignment with modern knowledge. They could also incorporate active learning techniques shown to foster higher engagement, classroom dynamics, and understanding. Implementing even a few active learning strategies initially, and gradually advancing to a more mixed-methods approach, may help improve student satisfaction and academic performance.

Limitations of this study include its small sample size and focus on one subject area. Further research with larger, representative samples across multiple disciplines could provide more generalizable insights. Longitudinal studies examining the impact of curriculum and teaching reforms over time would also offer valuable evidence to guide improvement efforts.

In conclusion, universities seeking to enhance student learning and outcomes should evaluate key dimensions of their curriculum quality and teaching approaches. Reform efforts prioritizing curricula that are relevant, rigorous and aligned with modern standards, combined with participatory teaching methods, show the greatest promise for positively transforming student experiences and achievement. This study provides initial evidence that could inform such curricular and pedagogical reforms within Iraqi universities and beyond. Further research exploring effective models of curriculum and teaching innovation would contribute valuable lessons to help higher education fulfill its mission of developing students' knowledge, skills, and abilities.

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