Research Article

Received: 01 January, 2026
Accepted: 10 July, 2026
Published: 22 July, 2026

The Impact of Online Learning on Iraqi University Students: Motivation, Interaction, and Engagement Compared to Traditional Learning

Batool Dahham Al Ali
Department of Oil and Gas Engineering, College of Oil and Gas Engineering, Basrah University for Oil and Gas, Iraq; batool.dahham@buog.edu.iq

Cite this article:

Al Ali, B. D. (2026). The Impact of Online Learning on Iraqi University Students: Motivation, Interaction, and Engagement Compared to Traditional Learning. Cultura Científica, (24), pp. 916–925.

Abstract

Online learning has become a major instructional mode in higher education, reshaping how students access content, communicate with instructors, interact with peers, and regulate their academic effort. This study examines how online learning affects motivation, interaction, and engagement among Iraqi university students in comparison with traditional classroom learning. A descriptive comparative design was used with 100 undergraduate students at Basra University of Oil and Gas, supported by semi-structured interviews with three instructors who had experience in online teaching. The findings show that students viewed online learning positively, with 76% reporting that it was appealing or useful. Reported motivation was almost evenly divided between primarily intrinsic motivation (52%) and primarily extrinsic motivation (48%), while 68% of students preferred a blended model. Students valued online learning because it offered flexibility, autonomy, repeated access to materials, and greater control over pace. However, weaker peer interaction, technological constraints, assessment concerns, and additional instructor workload limited its effectiveness. Interpreted through Self-Determination Theory, interaction theory, and multidimensional engagement models, the findings indicate that online learning can strengthen autonomy and cognitive participation when it is clearly structured, but it does not fully replace the social and emotional support of face-to-face instruction. The study concludes that blended learning is the most suitable model for this context because it combines online flexibility with classroom presence and institutional support.

Keywords: online learning, motivation, engagement, interaction, educational psychology, Iraqi higher education

1. INTRODUCTION

The rapid expansion of digital technologies has changed higher education from a primarily classroom-based experience into a more flexible system of face-to-face, online, and blended instruction. Learning management systems, video-conferencing tools, digital assignments, and recorded or uploaded materials now shape how students encounter academic content and communicate with teachers. From the perspective of educational psychology, this change is important because learning conditions influence not only access to information but also students' motivation, interaction, engagement, persistence, and sense of belonging. Motivation and engagement are widely recognized as central to academic achievement and long-term learning outcomes [1, 2]. The movement toward digitally mediated learning is therefore a psychological and pedagogical change as much as it is a technological one.

Higher education in Iraq has historically relied heavily on teacher-centered and lecture-based instruction. Such approaches can support the organized delivery of disciplinary knowledge, yet they often provide fewer opportunities for learner autonomy, flexible participation, peer collaboration, and self-directed study. Educational psychology emphasizes that meaningful learning is active, socially mediated, and motivationally sustained. Online learning may therefore offer valuable opportunities in Iraqi higher education by allowing students to revisit materials, regulate their own study schedules, communicate through digital tools, and continue learning when campus-based instruction is disrupted. At the same time, these opportunities depend on the availability of reliable internet access, digital skills, clear course organization, instructor presence, and institutional support.

Online learning has expanded in Iraqi universities in response to political instability, infrastructure limitations, and the disruptions caused by the pandemic. Universities have increasingly used platforms such as Google Classroom to maintain instructional continuity and distribute learning materials. However, the literature on Iraqi e-learning has often emphasized access, institutional readiness, and technical barriers more than the psychological experience of students [3]. Less attention has been given to how Iraqi students understand their motivation, interaction, and engagement in online learning when compared with traditional classroom instruction. This gap is important because successful online learning requires more than platform availability. It requires learning conditions that support autonomy, competence, relatedness, interaction, and active participation.

This study addresses that gap by examining Iraqi university students' perceptions of online learning in comparison with regular classroom learning. The focus is not on introducing a new instructional model, but on interpreting students' reported experiences through established educational psychology concepts. The study asks how online learning influences motivation, what forms of interaction are most visible in the online setting, how students perceive their participation compared with classroom learning, and what these findings imply for instructional design and higher education policy.

Self-Determination Theory provides a useful framework for interpreting motivation in this setting. The theory explains motivation in relation to three basic psychological needs: autonomy, competence, and relatedness [1]. Autonomy refers to students' sense of control over their learning process; competence refers to their sense of effectiveness, mastery, and confidence; and relatedness refers to their feeling of connection with instructors and peers. Online learning can support autonomy by allowing students to decide when and how often to review learning materials. It can support competence when tasks are clearly organized and feedback is timely. Relatedness, however, may be harder to sustain if online courses provide limited social presence or weak peer communication.

Motivation in online education is also shaped by the balance between intrinsic and extrinsic reasons for learning. Intrinsically motivated students value independence, interest, and personal growth, while extrinsically motivated students may value course completion, grades, access to materials, or practical convenience. Hartnett [4] argues that online motivation is strongly affected by instructional design, learner autonomy, feedback, and the social organization of learning tasks. In the Iraqi context, these factors are especially relevant because students may appreciate the flexibility of digital learning while still relying on direct classroom explanation and teacher guidance.

Interaction is another central element of online learning. Moore's interaction framework distinguishes among learner–content, learner–instructor, and learner–learner interaction [5]. Learner–content interaction concerns students' intellectual work with readings, lectures, assignments, and digital resources. Learner–instructor interaction provides clarification, feedback, encouragement, and academic direction. Learner–learner interaction supports discussion, collaboration, social belonging, and shared understanding. Swan [6] and Bolliger and Martin [7] show that instructor presence and engagement strategies can improve student satisfaction and participation in online environments. These forms of interaction are closely connected to the psychological needs described by Self-Determination Theory because they help students feel capable, supported, and connected.

Student engagement is commonly understood as a multidimensional construct that includes behavioral, cognitive, and emotional dimensions [2]. Behavioral engagement refers to attendance, participation, task completion, and visible involvement. Cognitive engagement refers to self-regulation, reflection, and sustained mental effort. Emotional engagement refers to interest, enjoyment, belonging, and affective connection with learning. Online platforms can support these

dimensions through flexible materials, discussion forums, feedback tools, and asynchronous access. Yet engagement can also weaken when students experience poor connectivity, unclear expectations, limited instructor presence, or social isolation.

Previous comparisons of online, blended, and face-to-face instruction show that learning effectiveness depends less on the physical location of instruction and more on the quality of design, interaction, and support. Bernard et al. [8] report that blended and technology-supported learning can be effective when technology is integrated with purposeful pedagogy. Neuhauser [9] similarly shows that online and face-to-face formats can produce comparable outcomes. Work on blended learning further indicates that hybrid models can combine the flexibility of online access with the social and instructional strengths of classroom teaching [10, 11]. These findings are relevant to Iraq because a blended model may respond to technical constraints while preserving instructor guidance and peer contact.

The present study contributes to this discussion by placing student experience at the center of the analysis. It examines whether online learning is perceived as motivating, how interaction occurs within online conditions, and whether students prefer online, face-to-face, or blended learning. The study is guided by four research questions: (1) How does online learning influence the motivation of Iraqi university students from an instructional point of view? (2) What are the common modes of interaction in online learning contexts in this setting? (3) What are students' perceptions of their participation in online learning compared with their participation in the regular classroom learning and teaching process? (4) What do these perceptions mean for instructional design and higher education policy?

2. METHOD

The study was carried out with 100 undergraduate students from Basra University of Oil and Gas. The participants had experience with both online and traditional courses, which made it possible to compare their perceptions across learning conditions. Google Classroom was the main online platform used in the study context. Three university instructors with experience in online teaching also participated in semi-structured interviews. The inclusion of both student and instructor perspectives strengthened the descriptive interpretation of the online learning experience without changing the study design.

The research design was descriptive and comparative. A structured questionnaire was used to examine students' intrinsic and extrinsic motivation, perceptions of interaction, engagement levels, and learning preferences. The interaction dimensions followed the three-part distinction between learner–content, learner–instructor, and learner–learner interaction. The questionnaire items were developed from established educational psychology literature and were intended to capture students' psychological and instructional experiences in online and traditional learning contexts.

Semi-structured interviews were conducted with instructors to examine their views on student motivation, interaction patterns, teaching challenges, assessment concerns, and the psychological requirements of online teaching. The questionnaire was distributed online using Google Forms. Instructor interviews were conducted in person, by phone, or online according to participant availability. Participation was voluntary, and confidentiality was guaranteed in accordance with research ethics.

Table 1. *Study profile*

Component	Description
Setting	Basra University of Oil and Gas, Iraq
Student participants	100 undergraduate students with experience of online and traditional learning
Instructor participants	Three university instructors with online teaching experience
Online platform	Google Classroom as the main online learning platform in the study context
Student instrument	Structured questionnaire addressing motivation, interaction, engagement, and learning preference
Instructor instrument	Semi-structured interviews addressing student motivation, teaching difficulties, interaction, workload, and assessment
Core comparison	Online learning compared with traditional face-to-face classroom learning

The study profile clarifies that the empirical base is modest but directly aligned with the research questions. The student questionnaire provided the numerical indicators reported in the results, while the instructor interviews helped explain why flexibility, instructor presence, peer interaction, and infrastructure mattered in practice. This design is appropriate for a context-focused educational psychology study because it links reported student experience with instructors' observations of online teaching conditions.

3. RESULTS

The results show that students generally viewed online learning positively. A substantial proportion of respondents, 76%, reported that online learning was appealing or useful. This level of positive perception was higher than the proportion reporting primarily intrinsic motivation (52%) and also higher than the proportion reporting primarily extrinsic motivation

(48%). The distribution suggests that online learning attracted students for more than one reason. Intrinsically motivated students valued flexibility, independence, and the ability to manage their learning. Extrinsically motivated students valued access to materials, completion of academic requirements, and the practical convenience of continuing study outside the fixed classroom schedule.

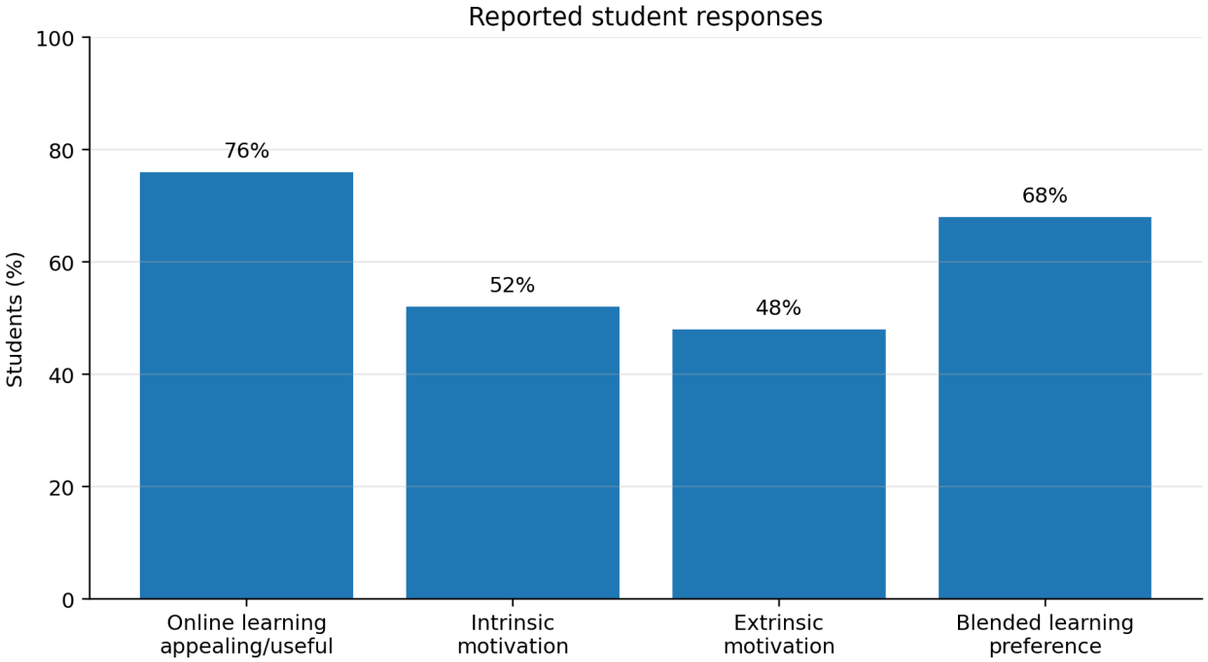

Figure 1. *Student response profile*

The pattern summarized in Figure 1 indicates that online learning was not rejected by students, but it was also not preferred as a complete replacement for face-to-face education. The strongest numerical signal is the 76% positive perception of online learning, while the 68% preference for blended learning shows that many students valued online flexibility together with classroom interaction. The close balance between intrinsic and extrinsic motivation further suggests that online learning served both psychological needs and practical academic needs.

Table 2. *Reported student indicators*

Indicator	Students	Percentage	Interpretation
Online learning described as appealing or useful	76	76%	Broadly positive perception of online learning
Primarily intrinsic motivation	52	52%	Interest linked to autonomy, flexibility, and self-direction
Primarily extrinsic motivation	48	48%	Interest linked to practical academic benefits and course completion
Preference for blended learning	68	68%	Preference for combining online access with face-to-face social presence

The numerical summary in Table 2 should be read in relation to the total student sample of 100. The findings do not show a simple opposition between online and traditional learning. Instead, they show that students recognized the usefulness of online learning while still wanting the social and instructional support of classroom teaching. The 68% preference for blended learning is therefore a central result because it identifies the delivery model most consistent with students' reported needs.

Students emphasized autonomy, flexibility, and control over pace as the main motivational advantages of online learning. Many respondents valued the opportunity to revisit uploaded materials, organize their own study time, and complete learning tasks without being restricted to the fixed pace of classroom instruction. These responses indicate that online learning supported a stronger sense of learner control. At the same time, the preference for blended learning shows that autonomy alone was not sufficient. Students also valued direct explanation, immediate clarification, and classroom social presence.

Interaction was a decisive factor in shaping students' online learning experience. Learner–instructor interaction appeared to be the strongest and most important form of interaction. Students identified instructor responsiveness, clarity of instructions, timely guidance, and available explanations as factors that improved participation. When teachers responded to questions and clarified tasks, students reported feeling more supported and more capable of completing course requirements. This result confirms that instructor presence remains central in online learning rather than becoming less important.

Learner–content interaction was also strong. Students appreciated repeated access to digital materials because it allowed them to review difficult topics and study at an individual pace. This advantage made online learning flexible and task focused. However, the benefit depended on the organization and clarity of course materials. Online content helped students most when instructors uploaded materials in a structured, understandable, and purposeful way.

Learner–learner interaction was present but weaker than learner–instructor and learner–content interaction. Students could communicate through online platforms, share materials, and participate in group tasks, but several respondents felt that peer interaction was less natural than classroom communication. This weaker peer dimension affected emotional engagement. Students could still complete assignments and access resources, but they did not always experience the same sense of social connection that occurs in a face-to-face classroom.

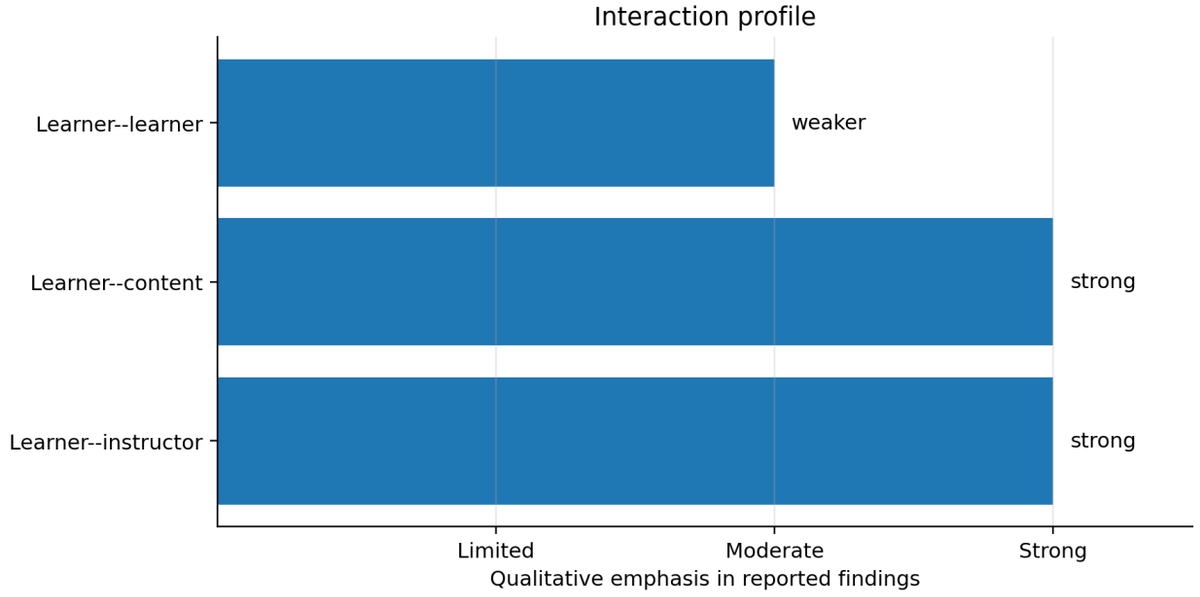

Figure 2. *Interaction profile*

The visual profile in Figure 2 summarizes the qualitative emphasis in the reported findings rather than adding a new measured scale. The strongest interaction channels were learner–instructor and learner–content interaction, both of which supported guidance, clarification, access to materials, and cognitive participation. The weaker learner–learner dimension explains why students could remain behaviorally and cognitively engaged while still reporting a reduced emotional and social connection in fully online conditions.

The findings on engagement follow the same pattern. Behavioral engagement was supported through online attendance, task completion, assignment submission, and following course instructions. Cognitive engagement was supported when students used uploaded materials for review, self-study, and assessment preparation. Emotional engagement was more variable. Some students found online learning comfortable and motivating because it allowed greater independence, while others felt less connected to classmates and instructors. This variation shows that online learning can support participation when well organized, but it may weaken belonging when peer interaction and social presence are limited.

Instructor interviews supported and deepened the student results. Instructors observed that online learning encouraged students to take greater responsibility for their own learning. Students had to manage time, follow instructions independently, access materials regularly, and complete tasks without constant direct supervision. Instructors also noted that students who were organized and self-directed adapted more easily to online learning than students who depended strongly on direct classroom guidance.

The instructor themes in Table 3 show that online learning cannot be judged only from the student side. Students may benefit from flexibility and autonomy, but these benefits depend on instructors' capacity to design materials, manage communication, and provide feedback. The same themes also explain why online learning should not be treated as a simple low-cost substitute for classroom teaching. It requires planning, time, digital infrastructure, and assessment support.

Taken together, the results show that students viewed online learning positively because it improved flexibility, autonomy, and access to learning materials. However, they preferred blended learning because fully online conditions did not consistently provide the social presence and peer interaction associated with classroom learning. The instructor interviews confirmed that online learning promotes responsibility and self-regulation, but also introduces challenges related to technology, assessment, and workload. These findings indicate that the effectiveness of online learning in this context depends on the quality of interaction, the clarity of course materials, the responsiveness of instructors, and the institutional

support available to both students and teachers.

Table 3. *Instructor interview themes*

Theme	Reported evidence	Implication
Learner responsibility	Students needed to manage time, access materials, follow instructions, and complete tasks with less direct supervision.	Online learning can strengthen self-regulation when students receive clear guidance.
Technological constraints	Weak internet connectivity, inconsistent access to devices, and technical problems limited participation.	Infrastructure remains a condition for successful online learning.
Assessment integrity	Instructors expressed concern about monitoring online quizzes, assignments, and examinations.	Online assessment requires clearer procedures and suitable evaluation design.
Instructor workload	Teachers had to prepare digital materials, manage platforms, respond to messages, upload resources, and provide feedback outside regular classroom hours.	Institutional support and training are needed to sustain online teaching quality.

4. DISCUSSION AND IMPLICATIONS

The findings support key assumptions in educational psychology about the role of autonomy, competence, relatedness, interaction, and engagement in effective learning. Online learning gave many students greater control over pace, timing, and repeated access to materials. This explains why it was perceived positively by 76% of respondents. From a Self-Determination Theory perspective, flexibility and control over study conditions can strengthen autonomy, which in turn can support intrinsic motivation and self-regulated learning [1, 4]. The results therefore show that online learning can be psychologically valuable when it is organized in a way that allows students to manage their own learning without losing academic direction.

The balance between intrinsic and extrinsic motivation is important. The 52% intrinsic and 48% extrinsic distribution shows that students did not respond to online learning for only one reason. Some valued independence and personal control, while others valued access, convenience, and the ability to meet course requirements. This mixed motivational pattern is consistent with Keller's motivational design perspective, which emphasizes attention, relevance, confidence, and satisfaction in instructional environments [12]. In the present study, online learning was relevant because it solved practical access problems, but it became more motivating when it also supported autonomy and confidence.

Competence was supported most clearly through learner–instructor and learner–content interaction. Students felt more capable when instructors provided clear guidance, timely explanation, and accessible course materials. This finding agrees with work showing that instructor presence and purposeful engagement strategies are central to online participation [6, 7]. It also shows that online learning cannot succeed through uploaded materials alone. Students need structure, feedback, and a clear sense of how digital resources connect to learning objectives.

Relatedness was the most fragile psychological need in the online environment. Learner–learner interaction was weaker than the other forms of interaction, and students reported that online peer communication lacked the immediacy and emotional quality of face-to-face communication. This result explains why the preference for blended learning was high. Students wanted the independence of online learning, but they also wanted the social presence of the classroom. This finding aligns with blended learning theory, which argues that effective hybrid models combine online flexibility with face-to-face community, dialogue, and instructional support [10, 11].

The pathway summary in Figure 3 connects the empirical findings with the psychological interpretation of the study. Online learning conditions mainly supported autonomy through flexibility and pace, and competence through clarity and feedback. Relatedness was supported when instructor contact was strong, but it was weakened when peer interaction was limited. Reported constraints, including connectivity, access, assessment, and workload, affected these psychological pathways. The result is a clear preference for blended learning as the model most likely to preserve motivation and engagement while reducing the limitations of fully online instruction.

The findings also refine the meaning of engagement in the study context. Behavioral engagement was maintained because students could attend online sessions and complete assignments. Cognitive engagement was supported because students could revisit materials and prepare at their own pace. Emotional engagement was less stable because students did not always feel socially connected. This distinction matters because high task completion alone does not necessarily mean that online learning is fully engaging. Universities should therefore design online and blended courses that include structured peer discussion, collaborative tasks, and regular opportunities for student questions and feedback.

From an instructional design perspective, the results indicate that online materials should not simply reproduce classroom lectures. They should be organized into clear units, connected to learning objectives, and supported by feedback. Pelz [13] emphasizes the importance of student activity, interaction, and teacher guidance in effective online pedagogy. Song et al. [14] also identify course design, instructor support, and communication as important factors in students' perceptions of useful and challenging online learning characteristics. These principles match the present findings: students benefited from flexible content access, but only when the content was clear and supported by instructor presence.

The instructor interviews highlight the institutional side of online learning. Teachers reported increased workload, assessment concerns, and technical barriers. These challenges are consistent with earlier discussions of distance learning and web-based instruction, which identify infrastructure, planning, interaction, and assessment as central issues [15, 16]. In Iraq, where technological resources may vary across students and institutions, online learning requires more than individual teacher effort. It requires training, technical support, assessment guidelines, and realistic workload policies.

The policy implication is that Iraqi universities should not treat online learning only as an emergency response. The evidence points toward a blended model as the most appropriate long-term direction. A blended model can preserve face-to-face explanation, peer contact, and classroom belonging while using online platforms for resource access, revision, assignment management, and flexible study. This approach can increase resilience during periods of disruption and improve everyday teaching when it is supported by stable infrastructure and clear institutional planning.

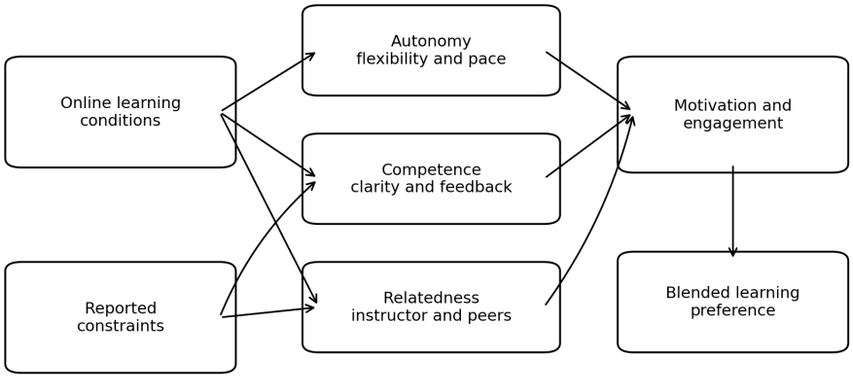

Figure 3. *Psychological pathways*

The study contributes to educational psychology by showing how established theories operate in a developing higher education context. Autonomy, competence, relatedness, interaction, and engagement remain relevant, but their expression is shaped by local conditions such as internet reliability, platform familiarity, teaching traditions, and instructor workload. The findings therefore extend the literature by demonstrating that the psychological value of online learning depends on the interaction between instructional design and context.

5. LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. First, the sample was limited to 100 undergraduate students and three instructors. Although the data provide useful insight into student and teacher experiences, they do not represent all Iraqi universities, disciplines, or student populations. Students in other institutions may experience online learning differently depending on infrastructure, course requirements, and institutional support.

Second, the study was conducted at Basra University of Oil and Gas. This focus allowed the study to examine one specific institutional context, but it limits generalizability. Future studies should include several Iraqi universities and compare institutions with different levels of digital readiness, student support, and online learning policy.

Third, the study relied on self-reported student perceptions and instructor interviews. Self-report data are valuable for understanding motivation and engagement, but they may be influenced by memory, preference, course experience, or social desirability. Future research should combine perception data with learning analytics, attendance records, assignment performance, course completion data, and direct observation of online interaction.

Fourth, the study did not follow students over time. Longitudinal research is needed to examine whether motivation, interaction, and engagement improve as students gain digital confidence or whether online fatigue and social isolation increase with extended use. Future work should also compare online learning experiences across practical, laboratory-based, theoretical, and discussion-based disciplines.

Further research may compare different online teaching strategies, including synchronous lectures, asynchronous materials, guided discussions, peer collaboration, and feedback models. Such studies would help identify which instructional arrangements most effectively support autonomy, competence, relatedness, and engagement in Iraqi higher education.

6. CONCLUSION

This study asked how online learning influences motivation, interaction, and engagement among Iraqi university students and what these perceptions imply for instructional design and higher education policy. The findings answer that question by showing that online learning is valuable but incomplete on its own. Students viewed online learning positively because it increased flexibility, autonomy, access to materials, and control over learning pace. These advantages supported motivation and cognitive participation, especially for students able to manage their time and study independently.

The study also shows that interaction determines the quality of online engagement. Learner–instructor interaction and learner–content interaction were the strongest elements of the online experience, while learner–learner interaction was weaker. As a result, online learning supported behavioral and cognitive engagement more consistently than emotional and social engagement. This difference explains why most students preferred blended learning. They wanted the independence of online study together with the social presence, immediate explanation, and peer connection of classroom teaching.

The main conclusion is that blended learning is the most suitable approach for the context examined in this study. It directly responds to the research findings because it combines the motivational strengths of online learning with the relational and instructional strengths of face-to-face education. For Iraqi universities, the practical priority is not to replace traditional classrooms with online platforms, but to build a structured blended system supported by instructor training, reliable technology, clear assessment procedures, and purposeful peer interaction. Under these conditions, online and blended learning can strengthen motivation, interaction, and engagement while making higher education more flexible and resilient.

REFERENCES

[1] Deci, Edward L., and Richard M. Ryan. "The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior." *Psychological Inquiry* 11.4 (2000): 227–268.

[2] Fredricks, Jennifer A., Phyllis C. Blumenfeld, and Alison H. Paris. "School engagement: Potential of the concept, state of the evidence." *Review of Educational Research* 74.1 (2004): 59–109.

[3] Al-Azawei, Ahmed, Patrick Parslow, and Karsten Lundqvist. "Barriers and opportunities of e-learning implementation in Iraq: A case of public universities." *The International Review of Research in Open and Distributed Learning* 17.5 (2016): 126–146.

[4] Hartnett, Maggie. *Motivation in Online Education*. Springer, 2016.

[5] Moore, Michael G. "Three types of interaction." *The American Journal of Distance Education* 3.2 (1989): 1–7.

[6] Swan, Karen. "Learning effectiveness online: What the research tells us." *Elements of Quality Online Education: Practice and Direction* 4.1 (2003): 13–47.

[7] Bolliger, Doris U., and Florence Martin. "Instructor and student perceptions of online student engagement strategies." *Distance Education* 39.4 (2018): 568–583.

[8] Bernard, Robert M., et al. "A meta-analysis of blended learning and technology use in higher education: From the general to the applied." *Journal of Computing in Higher Education* 26.1 (2014): 87–122.

[9] Neuhauser, Charlotte. "Learning style and effectiveness of online and face-to-face instruction." *The American Journal of Distance Education* 16.2 (2002): 99–113.

[10] Garrison, D. Randy, and Norman D. Vaughan. *Blended Learning in Higher Education: Framework, Principles, and Guidelines*. John Wiley & Sons, 2008.

[11] Moore, Michael G., and Greg Kearsley. *Distance Education: A Systems View of Online Learning*. Wadsworth, 2012.

[12] Keller, John M. *Motivational Design for Learning and Performance: The ARCS Model Approach*. Springer Science & Business Media, 2009.

[13] Pelz, Bill. "(My) three principles of effective online pedagogy." *Journal of Asynchronous Learning Networks* 14.1 (2010): 103–116.

[14] Song, Liyan, et al. "Improving online learning: Student perceptions of useful and challenging characteristics." *The Internet and Higher Education* 7.1 (2004): 59–70.

[15] Kofahi, Najib A., and Nowduri Srinivas. "Distance learning: Major issues and challenges." *International Journal of Instructional Technology and Distance Learning* 1.5 (2004): 9–22.

[16] Olson, Tatana M., and Robert A. Wisher. "The effectiveness of web-based instruction: An initial inquiry." *International Review of Research in Open and Distributed Learning* 3.2 (2002): 1–17.