

PAPER

An Integrated Model for Online-Offline Classroom for Optimizing Academic Management and Enhancing Student Learning Outcomes

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This study aims to develop an integrated online-offline classroom model based on academic management to enhance student learning outcomes at NanHang JinCheng College, Nanjing, China. Data were collected through a qualitative methodology from 392 students and 220 teachers using structured questionnaires. Descriptive statistical analysis focused on key dimensions such as student engagement, pedagogical flexibility, and academic management's role in optimizing learning performance. The findings indicate high student satisfaction in collaborative learning, knowledge application, and group discussions. However, moderate satisfaction was observed regarding diverse learning resources and proactive feedback-seeking behaviors. Teachers exhibited strong confidence in integrating hybrid learning models yet showed limited adaptation of lessons based on real-time student feedback. Academic management emerged as a crucial factor in shaping learning outcomes, highlighting the need for enhanced assessment tools and adaptive learning strategies. The study concludes that while the proposed hybrid model significantly improves student achievement, its long-term effectiveness depends on continuous professional development, optimized resource utilization, and dynamic adjustments through decision-making approaches. Integrating uncertainty modeling and intelligent learning analytics can refine hybrid learning frameworks for sustainable educational innovation.

KEYWORDS

mobile learning, integrated online-offline learning, academic management, hybrid learning model, pedagogical flexibility, intelligent decision-making

1 INTRODUCTION

Mobile development patterns have had a significant impact on our lives [1]. In the era of rapid development of "Internet plus," education, as a crucial tool for creating higher social wealth and realizing self-value, has also encountered significant opportunities and challenges [2]. In 2018, the Ministry of Education proposed the 2.0 era of

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education information. The 2.0 era has raised higher requirements for educational information, from the initial fusion of information to the development of innovative new education models. The requirements for teachers and students have also increased, from the application of information technology to the level of information literacy [3]. In recent years, various teaching forms, such as micro-classes and flipped classrooms, have emerged in the teaching of continuing education, and the application of information technology in this context has become increasingly common. The information technology revolution worldwide is evolving with each passing day [3]. The Internet has been integrated into all aspects of human life. It has also become a trend to combine education and information technology organically. In response to the requirements of education informatization, the teaching of continuing education needs to shift from traditional concepts, leveraging the advantages of both online and offline teaching, and integrate them organically to meet the personalized development needs of students in continuing education [4, 5].

In the online classroom teaching process of mixed continuing education, teachers can utilize the online platform to release learning materials and related tasks, allowing students to learn independently at home and meet the needs of personalized student development [6]. At the same time, teachers can also provide targeted help to students who have difficulties with autonomous learning through the online network platform. In offline teaching in the continuing education classroom, teachers can organize more efficient classroom teaching based on common problems in students' autonomous learning, as fed back by the online platform. At the same time, teachers can provide learning materials to address students' weak knowledge points, and students can achieve their long-term development outside of class [7]. Building an effective integrated online and offline classroom model based on academic management combines both online and offline teaching methods, achieving a gradual shift from continuing education classroom teaching to a student-centered approach, allowing students to cultivate core competencies while mastering knowledge [8].

Continuing education is essential for individuals to enhance their practical skills and academic qualifications. It adheres to the concept of lifelong education. In the information age, against the backdrop of the integrated development of online and offline teaching, colleges and universities should also keep pace with the times and assess their own teaching and management status through continuing education. In continuing education teaching, the integration of online and offline teaching development aims to alleviate the learning time shortage caused by the original simple self-study teaching method as much as possible. Implementing teaching reform is the foundation for effective teaching management, enhancing teaching quality and impact [9]. This study aims to explore the views of teachers and students on the needs and problems of online and offline learning, develop an integrated online-offline classroom model based on academic management, and evaluate its effectiveness in improving students' learning achievement.

2 RELATED WORK

The blending of online and traditional classroom learning has remained a significant interest in today's education systems, especially after the changes brought about by the COVID-19 outbreak. This mode of teaching delivery, blended learning, interconnects face-to-face classroom delivery with online delivery systems, which can be adapted to help deliver an improved learning method that can better students' learning [10]. The recent peculiarities of the teaching-learning context highlighted

the importance of the functioning of the academic management system, which is to handle both online and traditional models of activities since these systems are critical in communication and educational management as well as the control of students' performance and the maintenance of quality assurance [11]. Thus, referring to higher education institutions, such as NanHang JinCheng College in Nanjing City, China, the presented model of the integrated online-offline classrooms is not only the reaction to the growing tendency of the flexibility of the learning process but also the orientation to the increase of the student's learning achievements. This integration facilitates the creation of more involvement and an engaging learning environment, which impacts student motivation and participation [12]. As one of the explicit components of an effective blended learning model, LMSs help organize and deliver all course content, assessments, and communication between students and professors [6].

Software like Moodle and Blackboard helps teachers monitor student progress and their completion of the learning outcomes regardless of the modality in which the lesson is being delivered [13]. In China, these systems have been particularly effective in meeting students' needs because of their geographical and temporal limitations. Based on its modularity, students of NanHang JinCheng College can learn at their own pace using LMS platforms to enhance self-regulated learning [14]. It also affects the use of approaches to managing academic, teaching, and learning processes of blended learning environments, considering both online and face-to-face learning environments. Research on student academic success in blended learning established that academic management in the models relies strongly on the instructor's capacity to modify instruction mode to fit the learning setting [15, 16].

According to [17], blended learning should be informed by a student-focused approach, where academic managers and instructors can adapt to different learning styles among students. In the case of NanHang JinCheng College, where the students may have diverse technological literacy levels, it will be important to provide a comprehensive guide on technological training as a way of addressing the needs of all students who will need the technology component in the delivery of instruction at different levels and stages of the online course [18]. Additionally, instructors have to take the initiative to create community on and off the classroom to address the positive impacts on students' engagement and achievements [6].

There are challenges in linking online and face-to-face learning spaces, maintaining the quality of teaching and learning, and preserving academic standards. It pointed out that the prosecution of blended learning models is blamed for a potential discrepancy in the quality of instruction between its online and offline components [19]. The problem arising from this situation is that academic management must set standard policies on teaching in both parallel modalities. It entails periodic staff development to ensure instructors provide feedback and are well-equipped to apply teaching and technology tools and resources [20]. With continuous training programs for faculty members, NanHang JinCheng College could improve the uniformity of students' learning experiences, considering that students may move freely between online and offline classes [21].

Furthermore, the practices found in environments where blended learning was implemented also indicate that extensive planning must be made for student assessment to be fair and accurate. Listening check questions during synchronous instruction and formative assessments like quizzes and tests may not effectively measure a student's mastery of knowledge in conjunction with an asynchronous form of learning [22]. Therefore, academic management should include innovative assessment approaches, such as project-based and peer assessment coupled with reflective journals, to fit in the flexibility of blended learning. These assessment

strategies might offer a broader perspective on the student's learning profile and accomplishments, especially at learning institutions where students use online and offline resources, such as NanHang JinCheng College [23].

3 METHODOLOGY

3.1 Population and sampling

Nanjing Nanhang Jincheng College was selected as the case study site. The study targeted three groups: 600 teachers, 20,000 students, and 300 managers. A sample of 392 students, 220 teachers, and 171 managers participated through questionnaire surveys. Data were collected via mailing, face-to-face interviews, and follow-up visits to gather insights on the development of an integrated online-offline classroom model based on academic management.

3.2 Research instruments

The questionnaires addressed different dimensions relevant to each group. For students, the focus was on knowledge acquisition, internalization, task exchange, result sharing, and collaborative learning. The teachers' questionnaire assessed pedagogical flexibility, technology use, learning outcomes, professional development, and network synergy. For managers, the survey covered resource allocation, curriculum development, and staff training [24]. Each instrument was validated by three experts—two in education and one in statistical analysis—before distribution.

3.3 Data collection

Questionnaires were distributed to the selected participants using random sampling methods. Students and teachers were contacted through various channels, and responses were collected according to prearranged schedules. Data were compiled and analyzed using Microsoft Excel and SPSS, with assistance from IT and statistics professionals. This ensured accurate analysis of the factors influencing the integrated classroom model's development and effectiveness.

3.4 Data analysis

Data analysis involved descriptive statistics, ANOVA, t-tests, and correlation analysis to examine differences and relationships among variables. Factor analysis was used to reduce data complexity, while MANOVA assessed the combined effect of demographic and educational variables on the effectiveness of the proposed classroom model.

4 RESULTS AND DISCUSSION

Table 1 presents the general demographic information of the student sample, which has 392 participants. The data shows that 172 students are male, representing

43.88% of the sample, while 220 students are female, making up 56.12%. It indicates a higher proportion of female participants in the study. The valid percentages match the actual distribution, with the cumulative percentage reaching 100%, signifying that all gender-related data was accounted for in the sample.

Table 1. General information of students

General Information		Total (n) = 392			
		Frequency	Percentage	Valid Percent	Cumulative Percent
Gender	Male	172	43.88	43.88	43.88
	Female	220	56.12	56.12	100
Total		392	100	100	

Table 2 provides further details on the professional categories and grade levels of the 392 students in the study. Among the participants, 26.02% are from the Arts, 24.23% from science, 33.16% from Engineering, and 16.58% from other fields, with engineering having the most significant representation. The cumulative percentage confirms that all categories are fully represented. Regarding grade level, 25% of the students are freshmen, 30.61% are sophomores, 25.51% are juniors, and 18.88% are seniors. This distribution shows a balanced representation across all academic years, with the largest group being sophomores.

Table 2. Further information of students

General Information		Total (n) = 392			
		Frequency	Percentage	Valid Percent	Cumulative Percent
Professional Category	Arts	102	26.02	26.02	26.02
	Science	95	24.23	24.23	50.25
	Engineering	130	33.16	33.16	83.41
	Art and other	65	16.58	16.58	100
Total		392	100	100	
Grade	Freshman	98	25	25	25
	Sophomore	120	30.61	30.61	55.61
	Junior	100	25.51	25.51	81.12
	Senior	74	18.88	18.88	100
Total		392	100	100	

4.1 Teachers' general information

Table 3 presents the general information of the 220 teachers surveyed. The gender distribution indicates a predominance of male teachers (68.18%) compared to females (31.82%). Age data reveals that most teachers are between 46 and 50 (27.27%), followed closely by those over 51 (31.81%). Regarding educational qualifications, the majority holds a Master's Degree (59.09%), with Bachelor's and Doctoral Degree holders representing 22.73% and 18.18%, respectively. This demographic profile highlights a seasoned workforce with significant educational credentials.

Table 3. General information of teachers

		Frequency	Percentage
Gender	Male	150	68.18
	Female	70	31.82
Total		220	100
Ages	31 to 35	10	4.55
	36 to 40	30	13.64
	41 to 45	50	22.73
	46 to 50	60	27.27
	Over 51	70	31.81
Total		220	100
Education (latest)	Bachelor Degree	50	22.73
	Master's Degree	130	59.09
	Doctoral Degree	40	18.18
Total		220	100

Table 4. Additional general information of teachers

		Frequency	Percentage
Teaching Area	Engineering	50	22.73
	Art	100	45.45
	Medicine/Nursing and Associated	30	13.64
	Sciences	30	13.64
	Other	10	4.54
Total		220	100
Years of being a Tutor	1 to 5	20	9.09
	6 to 10	50	22.72
	11 to 15	40	18.18
	16 to 20	70	31.82
	21 to 25	30	13.63
	26 and above	10	4.56
Total		220	100

Table 4 provides additional general information about the 220 teachers surveyed. The most significant teaching area is Arts, with 45.45% of teachers, followed by Engineering (22.73%), Medicine/Nursing and Sciences (both 13.64%), and a small percentage in other fields (4.54%). In terms of experience, most teachers have been tutors for 16 to 20 years (31.82%), followed by those with 6 to 10 years of experience (22.72%). A smaller group has over 26 years of tutoring experience (4.56%).

Table 5 presents the years of experience of the 171 managers. The largest group of managers has 11 to 15 years of experience (32.19%), followed by those with 6 to 10 years (23.41%) and 1 to 5 years (17.54%). A smaller proportion has over 21 years of experience, with only 5.84% having 21 to 25 years and 3.51% over 26 years.

This distribution indicates that most managers have moderate experience, with a minority having little or extensive experience.

Table 5. The years of experience of the 171 managers

General Information		Total (n) = 171			
		Frequency	Percentage	Valid Percent	Cumulative Percent
Years of being a Manager	1 to 5	30	17.54	17.54	17.54
	6 to 10	40	23.41	23.41	40.95
	11 to 15	55	32.19	32.19	73.14
	16 to 20	30	17.54	17.54	90.68
	21 to 25	10	5.84	5.84	96.52
	26 and above	6	3.51	3.51	100
Total		171	100		

4.2 Results on opinions about online-offline learning integration

Students. Table 6 shows that students generally responded positively to the blended learning model. They reported high engagement in class discussions (mean = 4.32) and confidence in applying knowledge to real-life situations (mean = 4.10). Reflective practices also scored well (mean = 4.20). However, the use of varied learning resources (mean = 3.10) and actively seeking feedback (mean = 3.20) received only moderate ratings. Overall, students were highly engaged but less proactive in resource use and feedback-seeking.

Table 6. Acquisition of knowledge internalization skills

Questions	(n = 392)		Overall Prescribed Level Based on Responses
	Mean	S.D.	
1. How often do you actively engage in discussions or ask questions during classroom lectures to deepen your understanding of the subject matter?	4.32	0.85	High
2. How confident are you in applying the knowledge learned in the classroom to real-life situations?	4.10	0.92	High
3. How frequently do you reflect upon and consolidate your learning through self-reflection, summarizing key concepts, or creating study guides?	4.20	0.88	High
4. To what extent do you utilize various learning resources (e.g., textbooks, online materials, peer discussions) to enhance your understanding of the subject matter?	3.10	1.05	Medium
5. How often do you actively seek feedback from instructors or peers to improve your understanding of the subject matter?	3.2	0.9	Medium

Table 7 indicates that students are highly satisfied with the blended learning model’s support for exchanging and reporting learning tasks. Group discussions received the highest rating (mean = 4.50), followed by comfort in sharing insights (mean = 4.30) and progress reporting (mean = 4.25). Peer feedback (mean = 4.20) and use of technology tools (M = 4.00) were also rated positively, showing strong approval of collaborative and communicative aspects of the model.

Table 7. Exchange and reporting of learning tasks

Questions	(n = 392)		Overall Prescribed Level Based on Responses
	Mean	S.D.	
6. How often do you participate in group discussions or collaborative activities to exchange ideas and perspectives on assigned learning tasks?	4.5	0.9	High
7. How effective do you find the practice of reporting your learning progress to the class or instructor?	4.25	0.85	High
8. Do you feel comfortable sharing your learning experiences and insights with your classmates or instructors?	4.30	0.90	High
9. How often do you actively engage in peer feedback or peer evaluation of learning tasks?	4.2	0.80	High
10. How frequently do you utilize technology tools or platforms (e.g., online forums, discussion boards, social media) to exchange and report your learning tasks?	4.0	0.92	High

Table 8 highlights students' strong satisfaction with opportunities to showcase and communicate their learning results, with both related items receiving high mean scores (4.10 and 4.00). This indicates that the blended learning model effectively supports presentation skills and boosts learners' motivation.

Table 8. Showing and sharing learning results

Questions	(n = 392)		Overall Prescribed Level Based on Responses
	Mean	S.D.	
11. How often do you have opportunities to showcase your learning results through presentations, exhibitions, or other forms of public display?	4.10	0.80	High
12. How confident are you in effectively communicating and presenting your learning results to others?	4.00	0.85	High

Table 9 shows similarly positive views on collaborative exploration. Students rated group discussions highly for enhancing understanding (mean = 4.25), critical thinking (M = 4.10), and problem analysis (M = 4.20). However, scores were slightly lower for active contribution (M = 3.50) and ensuring equal participation (M = 3.80), suggesting room for improvement in fostering inclusive and balanced group dynamics.

Table 9. Collaborative exploration by group discussion

Questions	(n = 392)		Overall Prescribed Level Based on Responses
	Mean	S.D.	
13. How often do you collaborate in group discussions to explore and analyze complex problems or topics?	4.20	0.87	High
14. How effective do you find collaborative exploration through group discussions in deepening your understanding of the subject matter?	4.25	0.83	High
15. Do you feel that group discussions facilitate critical thinking, creativity, and the development of collaborative skills?	4.10	0.7	High
16. How often do you actively contribute your ideas and perspectives during group discussions?	3.50	0.75	Medium
17. I ensure equal participation and inclusion within group discussions.	3.8	0.90	medium

Teachers. Table 10 shows the teachers expressed high satisfaction with integrating online and offline teaching, adaptability to various learning needs, and confidence in handling unexpected changes (mean scores: 4.0–4.3). However, modifying lessons based on student feedback was rated moderately (mean = 3.8), indicating room for improvement in responsiveness to learners.

Table 10. Teachers’ response to integrating online and offline teaching

Questions	(n = 220)		Overall Prescribed Level Based on Responses
	Mean	S.D.	
1. To what extent do you feel the integration of online and offline teaching methods enhances your teaching experience?	4.3	0.8	High
2. How effectively do you adjust teaching? What strategies accommodate different learning preferences in the integrated online classroom model?	4.1	0.85	High
3. To what extent do you find your lessons engaging and interactive?	4	0.9	High
4. How often do you modify lesson plans based on student feedback and performance?	3.8	0.95	Medium
5. How confident are you in adapting to unexpected changes in the learning environment?	4.2	0.75	High

Tables 11 and 12 overall, teachers felt confident using technology in teaching. They rated their comfort with digital tools (mean = 4.15) and their support for students’ digital skills (mean = 4.05) highly. Technology’s role in enhancing teaching and promoting collaboration was also rated high (mean = 3.87–4.00). However, the use of multimedia resources was only moderate (mean = 3.90), suggesting potential to increase engagement through more diverse digital content.

Table 11. Technology integration and digital literacy

Questions	(n = 220)		Overall Prescribed Level Based on Responses
	Mean	S.D.	
6. To what extent do you think technology is effectively utilized to improve teaching?	3.87	0.88	High
7. How comfortable are you with the online platforms and tools for teaching?	4.15	0.82	High
8. How often do you incorporate multimedia resources (videos, interactive simulations) into lessons?	3.9	0.93	Medium

Table 12. Technology integration and digital literacy

Questions	(n = 220)		Overall Prescribed Level Based on Responses
	Mean	S.D.	
9. How well do you provide guidance and support for digital tools and resources?	4.05	0.87	High
10. To what extent do you encourage students to use technology for collaborative learning and research?	4	0.85	High

Table 13 Teachers strongly agreed that academic management positively impacts student performance (mean = 4.35). They felt administrators understand how their decisions affect learning and that collaboration among educators, administrators,

and parents is effective (mean = 4.00–4.20). They also affirmed the presence of continuous improvement mechanisms (mean = 4.15), showing broad confidence in the academic management system.

Table 13. Linkages with learning outcomes

Questions	(n = 220)		Overall Prescribed Level Based on Responses
	Mean	S.D.	
11. The extent to which Academic management influences student academic performance	4.35	0.8	High
12. How well do school administrators understand the connection between their management practices and student learning outcomes?	4.1	0.84	High
13. The perceived effectiveness of Academic management in improving learning outcomes	4.2	0.78	High
14. The level of collaboration between teachers, administrators, and parents in enhancing student learning outcomes through Academic management	4	0.9	High
15. The presence of mechanisms for continuous assessment and improvement of learning outcomes within Academic management systems	4.15	0.83	High

4.3 Discussion

From this study, students' and teachers' perceptions of the online and offline learning modes have been ascertained to show the areas of strength that need further improvement. Looking at the results from the student responses, it is clear that they are generally satisfied with the blended learning model and their level of activity or active participation, confidence in the use of knowledge that they acquired, and ability to reflect. As for learners' active participation and interaction in group discussions, peer feedback, and the use of technology for collaboration, the effectiveness level was found to be high. However, there are areas in which students' satisfaction is moderate, including using various learning resources and their efforts to obtain feedback from their instructors and peers. These studies indicate that the blended model successfully learns and collaborates effectively; however, using learning resources can be more effective, and students should seek feedback more frequently. Similarly, the teachers described high satisfaction levels regarding the flexibility and modularity of the online learning approaches [25]. The combination of the online and offline classes was viewed as helpful in the teaching process, with teachers looking confident in their ability to adapt to the environment to make lessons more appealing. However, the degree to which lesson plans were reported to be modified due to students' feedback was lower; this suggests that although teachers appear flexible to some extent, there might not be much commitment to the process of constant change in teaching strategies in light of shifting students' needs. Also, technology integration was perceived as commendable because most teachers appeared assured and competent while handling technological tools in class [26]. The use of multimedia aids in teaching was rated average. It means that although technology-enhanced learning is effectively practiced in general, there is further room for enhancement in the implementation of multimedia to enhance the learning process.

Regarding academic management, teachers expressed high self-confidence regarding its influence on learners' achievements. They acknowledged that academic management impacts performance, cooperation between teachers and principals, and the availability of feedback systems. However, the tools and methodologies that

were used in order to assess the effectiveness of the use of academic management in enhancing the learning outcomes were rated moderately, which means that even though assessment practices are commonly conducted, there is room for improvement in terms of the practices and the tools that are being used. In the sections about professional competencies, the teachers considered professional development important. They reported being receptive to feedback and receiving high scores in these aspects. However, the reflection based on student feedback was rated somewhat lower, indicating potential for future development in this area.

4.4 Practical implication

The present research results are summarized and provide several practical recommendations for improving the integrated online classroom model at NanHang JinCheng College. First, institutions need to reconsider a continuous process of strengthening the teacher's elaboration of online classes by developing continuative and collaborative practice using digital tools in teaching within a hybrid learning environment and adapting lessons to students' feedback. Furthermore, better organization of the learning resources and enhancing the active feedback-seeking behaviors of learners can help improve the learning experience. In student success, academic management remains central to the provision of learning. However, there is a need to enhance the effectiveness of assessment parameters in establishing the effectiveness of applied academic strategies. In addressing these areas, institutions can design a flexible learning environment that supports students' learning processes to give optimum online and offline learning results.

5 CONCLUSION

This study demonstrates that integrating online and offline classroom models in the teaching-learning process significantly enhances student learning achievement, as evidenced by findings from NanHang JinCheng College. The results highlight students' active engagement and the teachers' flexibility, particularly in fostering collaborative learning and knowledge application. However, particular areas require further improvement, including the effective utilization of diverse learning resources, enhancement of feedback mechanisms, and refinement of academic management tools to maximize their impact on student outcomes. This study underscores the critical role of continuous professional development for educators and the need for dynamic adaptation of teaching materials to meet students' evolving needs. Strengthening these areas will further amplify the positive effects of the integrated classroom model, ultimately leading to a more effective and adaptive educational framework.

6 LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. It was conducted at a single institution, limiting generalizability. Data were self-reported, which may introduce bias, and the cross-sectional design only captures a snapshot in time. Future research should consider longitudinal or experimental methods, explore the model's applicability in diverse contexts, and examine the use of emerging technologies such as AI and VR.

Long-term studies could offer deeper insights into the sustained impact of hybrid learning.

7 REFERENCES

- [1] S. O. Wagbara and E. F. Ikwut, "Comparative analysis of online and offline classroom instructions for effective learning of integrated science," *Fac. Nat. Appl. Sci. J. Math. Sci. Educ.*, vol. 3, no. 3, pp. 1–7, 2022.
- [2] M. Thongmak and N. Ruangwanit, "Online learning vs. offline learning in an MIS course: Learning outcomes, readiness, and suggestions for the post-COVID-19 world," in *ICEB 2021 Proceedings (Nanjing, China)*, 2021. [Online]. Available: <https://aisel.aisnet.org/iceb2021/6>
- [3] Y. Lu, "Application of independent learning mode for college students based on online-offline integration in the internet era," *Appl. Math. Nonlinear Sci.*, vol. 9, no. 1, pp. 1–15, 2023. <https://doi.org/10.2478/amns-2024-0258>
- [4] S. C. Yen, Y. Lo, A. Lee, and J. Enriquez, "Learning online, offline, and in-between: Comparing student academic outcomes and course satisfaction in face-to-face, online, and blended teaching modalities," *Educ. Inf. Technol.*, vol. 23, pp. 2141–2153, 2018. <https://doi.org/10.1007/s10639-018-9707-5>
- [5] L. Xiangming, X. Zhang, X. Zeng, and J. Zhang, "Exploring online student engagement scaffolded by teacher management communication style," *International Journal of Emerging Technologies in Learning (IJET)*, vol. 17, no. 15, pp. 4–15, 2022. <https://doi.org/10.3991/ijet.v17i15.31513>
- [6] H. Liu, Q. Zhu, W. M. Khoso, and A. K. Khoso, "Spatial pattern and the development of green finance trends in China," *Renewable Energy*, vol. 211, pp. 370–378, 2023. <https://doi.org/10.1016/j.renene.2023.05.014>
- [7] Y. Zhu *et al.*, "Application of fuzzy analytic hierarchy process in environmental economics education: Under the online and offline blended teaching mode," *Sustainability*, vol. 14, no. 4, p. 2414, 2022. <https://doi.org/10.3390/su14042414>
- [8] S. A. Shanta, "Student performance evaluation between offline and online pedagogy: A critical analysis with possible suggestions," *J. Manage. Info*, vol. 8, no. 4, pp. 231–252, 2021. <https://doi.org/10.31580/jmi.v8i4.2080>
- [9] H. Wu and H. Li, "Research on how to construct a dialogical teaching course under the development of online-offline integrated teaching and learning—The intermediate financial accounting course as an example," *Adv. Educ. Technol. Psychol.*, vol. 8, no. 1, pp. 200–209, 2024. <https://doi.org/10.23977/aetp.2024.080126>
- [10] X. Li, "A hybrid online and offline approach to teaching spoken English based on modern educational technology," *Math. Probl. Eng.*, vol. 2022, no. 1, p. 3803436, 2022. <https://doi.org/10.1155/2022/3803436>
- [11] F. Li, "Mixed teaching mode for online and offline under COVID-19 epidemic situation," *Front. Educ. Res.*, vol. 5, no. 1, pp. 16–24, 2022. <https://doi.org/10.25236/FER.2022.050103>
- [12] R. A. Mahesar *et al.*, "Unveiling shadows: Analyzing suicide reporting in Muslim-majority countries vis-à-vis WHO's media guidelines," *CNS Spectr.*, vol. 29, no. 4, pp. 221–223, 2024. <https://doi.org/10.1017/S1092852923006351>
- [13] X. Liu, "Research on the breakthrough path of online and offline education integration under the background of deep integration of information technology and education," in *2022 3rd Int. Conf. Educ., Knowl. Inf. Manage. (ICEKIM)*, 2022, pp. 863–867. <https://doi.org/10.1109/ICEKIM55072.2022.00189>
- [14] S. Wang, "'Online-offline' teaching design of international settlement based on application ability training," *Creative Educ.*, vol. 15, no. 7, pp. 1461–1472, 2024. <https://doi.org/10.4236/ce.2024.157088>

- [15] F. Chen and P. Yang, "Promoting early childhood learning education: A systematic review of structural quality of preschool education in China," *J. Adv. Humanit. Res.*, vol. 3, no. 1, pp. 41–58, 2024. <https://doi.org/10.56868/jadhur.v3i1.205>
- [16] D. Akila, H. Garg, S. Pal, and S. Jeyalakshmi, "Research on recognition of students attention in offline classroom-based on deep learning," *Educ. Inf. Technol.*, vol. 29, pp. 6865–6893, 2024. <https://doi.org/10.1007/s10639-023-12089-6>
- [17] K. Khoso *et al.*, "The impact of ESL teachers' emotional intelligence on ESL students' academic engagement, reading, and writing proficiency: Mediating role of ESL students' motivation," *Int. J. Early Child. Spec. Educ.*, vol. 14, pp. 3267–3280, 2022.
- [18] L. X. Wang, Z. R. Feng, and G. M. Zhang, "The exploration and practice of online-offline hybrid teaching mode for 'Engineering Drawing'," *J. Nanchang Hangkong Univ. (Nat. Sci. Ed.)*, vol. 37, no. 4, pp. 136–140, 2023.
- [19] Y. Yang and H. Cai, "Teaching presence and academic achievement: The mediating role of psychological capital in online and offline hybrid college English course," *Open J. Mod. Linguist.*, vol. 13, no. 1, pp. 210–233, 2023.
- [20] F. Riaz *et al.*, "Students' preferences and perceptions regarding online versus offline teaching and learning post-COVID-19 lockdown," *Sustainability*, vol. 15, no. 3, p. 2362, 2023. <https://doi.org/10.3390/su15032362>
- [21] L. Bian, "Integration of 'Offline + Online' teaching method of college English based on web search technology," *J. Web Eng.*, vol. 20, no. 4, pp. 1145–1156, 2021. <https://doi.org/10.13052/jwe1540-9589.20412>
- [22] Q. Zhang, "Research on the development path of online and offline integrated teaching in universities under the background of digital intelligence era," *Front. Educ. Res.*, vol. 7, no. 6, pp. 60–64, 2024. <https://doi.org/10.25236/FER.2024.070608>
- [23] C. X. Liu and L. Wang, "Effectiveness of the 'online + offline + practice' trinity teaching model on the learning of junior nursing students: An exploratory study," *Nurs. Commun.*, vol. 8, no. e2024012, 2024. <https://doi.org/10.53388/IN2024012>
- [24] A. Tahat, M. N. Smadi, and M. Syouf, "A practical evaluation of ML algorithms for a tag-based BLE indoor positioning system," *International Journal of Online and Biomedical Engineering (ijOE)*, vol. 16, no. 8, pp. 39–54, 2020. <https://doi.org/10.3991/ijoe.v16i08.14795>
- [25] J. Wang, "Intelligent education based on mobile learning: Transitioning from traditional classrooms to adaptive learning environments," *International Journal of Interactive Mobile Technologies (ijIM)*, vol. 19, no. 11, pp. 51–65, 2025. <https://doi.org/10.3991/ijim.v19i11.56057>
- [26] J. Shi and Z. Chen, "Research on 'online and offline' blended teaching mode and multiple assessment system based on MOOC+SPOC," in *Proceedings of the 2018 2nd International Conference on Education Science and Economic Management (ICESEM 2018)*, 2018, pp. 241–244. <https://doi.org/10.2991/icesem-18.2018.54>

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