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Research Article

Artificial Intelligence, Big Data, and Information System User Experience: A Comprehensive Approach to Cross-cultural Adaptation in Educational Management of International Students

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ABSTRACT

This study analyses how AI integration, Big Data, information system quality, and cultural variables affect foreign student education and cross-cultural adaption. We discover patterns and connections in technological and cultural aspects affecting educational effectiveness using Explainable AI (XAI) and machine learning. The study found that big data, AI integration, and high-quality information systems increase international student user experience. Collectivism may prefer collaboration, whereas individualism may prefer tailored AI learning. Moderation shows that student culture strongly impacts technological interventions, highlighting the need for culturally suitable instructional technology. AI integration, big data use, and high-quality information systems boost user experience and academic performance more in China than in Pakistan. To help international students succeed, schools must use technology and culturally sensitive management. Schools must use technology with student culture in mind. Create technologically advanced and culturally flexible educational management solutions for all pupils. This study found that AI integration, big data, information system quality, and culture affect international students' education and performance. The research helps schools choose and manage technology to help foreign students succeed.

Keywords: Artificial Intelligence, User Experience, Educational Management, Cross-Cultural Adaptation, Big Data.

INTRODUCTION

AI and Big Data have transformed digital school management. This change is crucial for international students whose lives and academic achievement are increasingly digital. Educators must understand the complex relationship between AI, Big Data, information system quality, cultural characteristics, user experience, and academic success to serve globalized students (Yue, 2022). This research examines these important connections to guide instruction, technology integration, and student assistance in today's globally connected and technologically driven educational environment. To help school administrators solve modern difficulties, the study assesses AI, Big Data, information system quality, cultural attributes, user experience, and academic success.

Integration of educational AI with Big Data presents problems and potential. AI-driven learning platforms improve student learning with tailored experiences, adaptive feedback, and data-driven insights. Information system efficacy impacts digital education results and engagement (Nguyen & Malik, 2022). Cultural values

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influence how students use instructional technologies, boosting their effectiveness. Communities that emphasize collective learning may favor collaborative platforms for group activities, whereas those that value individual performance may prefer individualized learning (; M. Chen & Yuan, 2022). Language and education may impact tech use. Given these dynamics, the study examines how cultural impacts, AI, Big Data, and information system quality affect foreign students' academic achievement and user experiences (Nakamura, de Oliveira, & Conte, 2017). The project explores these complicated relationships to develop culturally sensitive educational technologies and management strategies to improve international students' digital learning experiences and outcomes (Fang, 2022).

International students' grades and experiences are changing thanks to AI and Big Data. Technology changes education, thus its influence on this diverse student group must be examined. AI and Big Data are revolutionizing education, especially for overseas students (Guan, Mou, & Jiang, 2020). To address international students' demands in this quickly evolving educational environment, educators and institutions must manage the intricate links between AI, Big Data, information system quality, cultural variables, user experience (UE), and academic success. The complicated relationship between technology and culture in international students' education must be studied (Zhai & Wibowo, 2023; Mokhothu & Callaghan, 2018; T. Wang & Park, 2021).

AI-powered learning systems are driving this technological revolution with customized learning, adaptive feedback, and data-driven insights. Technology quality and functionality aid digital education and AI integration (Ma, 2022). These digital platforms' effectiveness and usability affect the educational user experience, proving that information system quality matters (Al-Sharafi et al., 2022). AI, Big Data, and information system quality influence UE and AP culture. Culture shapes students' instructional technology preferences, priorities, and interactions. Students may prefer collaborative platforms if society values group learning and personalized learning if it values individual achievement (Ahmad & Wan Abdul Ghapar, 2019). Educational technology must be culturally responsive due to linguistic and educational differences.

Cultural and technological issues including AI integration, Big Data utilisation, and information system quality affect international students' education and accomplishment. These difficult dynamics can assist educators and institutions use technology, informing pedagogy, and customising support for international students. AI and Big Data are improving cross-cultural communication and global citizenship in education (Collins & Callaghan, 2018). These technologies are crucial to enhancing educational success and building a more fair and connected society through international education. Understanding how these cutting-edge technology, the caliber of the information system, and cultural factors interact to affect user experiences and academic achievements is crucial (Bierwiaczonek & Waldzus, 2016). The information of insight and findings of the study aid academic institutions, governments, and educators in creating foreign student support programs for changing educational environments. Understanding technology and culture helps stakeholders tailor interventions and learning solutions for international students. The conclusions drawn from this study also have broader implications because they advance our knowledge of how technology and culture interact to affect educational experiences and outcomes, providing insight into how education will develop in a society that is becoming more technologically advanced and interconnected (Hendrickson & Rosen, 2017).

For foreign students, the area at the convergence of technology, culture, and educational administration is dynamic and challenging (Bajaj & Sharma, 2018; Hrehová, Žiaran, & Seňová, 2021; Shafaei & Razak, 2016). Although the use of Big Data, AI integration, and information system quality in influencing student experiences is becoming more widely acknowledged, there are still some significant gaps in the literature. Numerous studies have looked at these factors separately, ignoring the complex interactions between them. Additionally, nothing is known about how important moderators in this situation are cultural factors. By thoroughly analyzing the interactions between AI, Big Data, Information System Quality, and cultural factors, with an emphasis on their influence on the User Experience and Academic Performance of foreign students, this study aims to close significant research gaps. The main goal is to learn how educational institutions may successfully combine cutting-edge technology with culturally considerate ways to improve the academic performance of international students.

We evaluate how information system quality, AI integration, Big Data utilization, and culture affect international students' academic achievement and user experiences. These interactions are studied to better education, technology, and student support. The study reveals how these variables affect student outcomes and experiences, improving educational management. The cross-cultural method illuminates several civilizations. The project intends to construct adaptive and culturally sensitive educational management systems to help foreign students succeed in a global and technologically sophisticated educational environment. Additionally, the findings' generalizability is improved by the cross-cultural approach, which provides insights that may be used in a variety of cultural situations. The study lays the groundwork for the creation of flexible and culturally aware

educational management systems, which will eventually help foreign students succeed academically and feel satisfied in a world where education is becoming more technologically and globally oriented.

There are five distinct sections in the paper. The introduction provides a brief summary of the research's objectives and sets the stage for the next sections. To further comprehend the intricate relationships between these elements, the literature review examines current studies. The methodology part prepares the study by describing data collection and analysis. The findings section explains how these variables affect academic performance and user experience. The discussion section examines the study findings and suggests future research and practice. It also advises on education management.

LITERATURE REVIEW

Digital school management increasingly uses AI and Big Data. Growing research on AI integration's promise to improve education by offering students individualized learning experiences and data-driven insights supports this trend. It has been discovered that AI-powered learning systems improve student performance and engagement (Aoun, 2017). This empirical evidence shows that AI technologies are essential to modern education, providing adaptive feedback and individualized learning pathways. As AI integrates, educational information system quality is a research focus. Information systems improve students' user experience, making digital learning platforms valuable. Information system quality greatly affects UE, underscoring the relevance of accessibility and simplicity in learning settings, according to (ÓhÉigeartaigh, Whittlestone, Liu, Zeng, & Liu, 2020). User-centric, high-quality information systems increase UE and academic outcomes (Santoso, Schrepp, Hasani, Fitriansyah, & Setyanto, 2022).

Culture impacts technology-education relationships beyond technology. Culture can affect kids' learning and technology use. Kannan and Munday (2018) found complex cultural diversity effects on education. Y. Wang, Noltemeyer, A. Wang, Zhang, and Shaw (2018) stressed culturally sensitive technology integration and educational acceptance of cultural differences. For good user experiences and academic achievement in international educational environments with diverse pupils, cultural dynamics must be recognized (Zhong, Wang, Cao, & Liu, 2020). The complex interplay between AI, Big Data, and culture affects education (Wang et al., 2018). By studying these interconnected domains, educators and policymakers can develop sophisticated strategies to improve educational management systems, user experiences, and inclusive learning environments to meet students' worldwide needs.

The first high school AI-driven adaptive learning system study was introduced by Alaie (2020). This unique approach adapted student learning routes and feedback using AI algorithms. AI interventions improved academic achievement and student engagement by 15%. AI boosts high school grades and learning. College students' use of information systems was explored by Luo and Zhang (2021). The impact of information system design on educational user experience was explored. Information system usability and efficacy dramatically affected student happiness and academic accomplishment. Information system interfaces that were easy to use boosted student achievement. Effective learning environments involve information system design (Blanchard, 2020).

Blanchard (2020) found cultural influences on educational technology. Researchers uncovered cultural technology use differences by evaluating student preferences and priorities. Individuals favoured self-paced learning tools, whereas groups chose collaborative ones. Designing inclusive educational tools for diverse pupils involves cultural awareness and management. Garcia et al. customised K-12 with Big Data. Each student's education was data-driven. This customised approach improves student engagement, teaching, and performance (Di et al., 2022). Fu, Si, Xie, and Shan (2023) comprehensively studied e-learning cross-cultural adaption issues. Culturally responsive course design and support system installation helped international students adapt. Culturally diverse schools improve student success and well-being (Hoel & Chen, 2019).

AI integration and higher education student retention were explored by Liu, Song, and Yan (2022). University early warning systems using AI detected at-risk students and intervened swiftly, enhancing retention. Dailey-Strand, Collins, and Callaghan (2021) investigated how Big Data could engage students with personalized learning resources. This research implies AI and Big Data may transform education, teaching, and achievement. These findings can help educators and policymakers use technology to improve education for all children.

Ten, Prikhodko, and Linnikov (2021) evaluated the complex relationship between school management information system quality and teacher satisfaction. The study indicated that information system quality affects teacher satisfaction and productivity. Teachers may educate and grow when information system enhancements reduce administrative tasks. Effective information systems are vital for instructors and students. P. Chen, You,

and D. Chen (2018) examined cultural adaptation in AI-enhanced learning. Culturally suitable AI-driven materials and communication approaches improve international students' academic performance and belonging. Customising educational content and communication to students' cultures fosters engagement and academic success across diverse student populations.

Dai and Ke (2022) examined how culturally sensitive AI aids online learning. Their research showed that cultural sensitivity and cutting-edge AI technology improved international students' user experience and academic achievement. Cultural concerns in AI-driven educational interventions can help instructors meet the learning needs and preferences of various students, ensuring equal access to high-quality education. Despite substantial research on AI integration, Big Data use, Information System Quality, and Cultural Variables in educational administration, their complex relationships need further study. Understanding how different factors affect each other is essential to improving educational management and learning outcomes in international education, where cultural diversity is frequent (Bayram, 2021; Badran, Baydoun, & Hillman, 2019; Cao & Meng, 2022).

Finally, future studies should examine the intricate relationship between technology, culture, and education. AI integration, Big Data use, Information System Quality, and Cultural Variables can assist researchers create inclusive and culturally responsive educational settings that improve student accomplishment and well-being worldwide. This integrative educational research approach could improve global education and student learning. This issue description advises studying complex element interactions. Instructors and institutions must comprehend international students' needs. As technology, culture, and international education advance, this research gap must close. Globalization presents additional education management difficulties and opportunities. It prepares for a full study of these factors' effects on international students' education and performance.

METHODOLOGY

This mixed-method study examines cross-cultural educational management's complicated dynamics using quantitative and qualitative methodologies. Academic publications, conference proceedings, government papers, company reports, online databases, and country surveys will provide data. Using Chinese industrial and educational institution data, AI integration, big data use, information system quality, and cultural aspects affecting international students' education will be explored. A questionnaire in **Appendix I** explains the study methods. The survey will evaluate academic achievement and usability. This study investigates the complicated links between technology, culture, and education utilising primary and secondary data.

Model Development

Data analysis will model AI integration, big data use, information system quality, and international students' user experience. Technical aspects, directly and indirectly, affect UE, and this model will explain how culture affects academic performance. AI-integrated educational products and systems may boost AP by offering personalized, adaptive learning and support. Big data—the volume, variety, and quality of student data and data analytics technologies—should help UE detect student preferences and performance patterns and customize support and resource distribution. Stable, user-friendly, and culturally responsive information technology helps improve AP by creating interesting and accessible learning environments. Culture, individualism vs. collectivism, and technology attitudes affect AI integration, big data use, information system quality, and UE. Individualistic pupils prefer customized learning tools, while collectivistic students prefer collaboration. Improved UE should mediate technical variables and AP, enhancing academic achievement. International students at Chinese schools will provide quantitative surveys, system usage logs, and qualitative interviews and focus group data for the model. SEM, multiple regression, and moderation analysis will investigate potential correlations and cultural moderators. Cross-validation and independent data assess model robustness and generalizability. This model will show how culture influences UE and AP using AI, big data, and information system quality, enhancing educational technology and cross-cultural research. Using AI and big data and enhancing information system quality to satisfy student cultures, administrators and lawmakers can foresee and improve UE and AP. Our concept will improve international student learning with current and culturally relevant educational administration. Data protection, informed consent, and cultural and ethical data processing are ethical issues. For transparency, validity, and reproducibility, **Appendix I** provides study methodology, measurement, and data collection. These traits help evaluate and improve international students' education through culturally appropriate technical training.

Research Equations

User Experience (UE) = f (AI integration, big data utilization, information system quality, cultural variables)

According to this equation, the quality of the information system, cultural factors, big data usage, and AI integration all affect foreign students' user experiences. It measures the intricate interactions between various variables that shape the user experience, a crucial component of educational management.

Academic Performance (AP) = f (AI integration, big data utilization, information system quality, cultural variables, UE)

User experience (UE) is equally important as AI, big data, information system quality, and culture for academic success. It shows how UE balances technology and intellect to better education. This study examines Chinese corporate data to assess how big data, AI, and IT affect foreign students' academic achievement and user experience. Technology will improve international student education administration in real-world, cross-cultural scenarios. In many ways, it increases knowledge. First, it will demonstrate how Chinese companies' AI, big data, and information systems affect international students' user experience, with practical ramifications. Supporting international students with technology requires knowledge of best practices and risks. The study will use real-world data to investigate how these technologies affect students' education.

Second, a predictive model aids education management stakeholders' planning. This model helps educators, administrators, and legislators predict how technology will affect user experience and academic performance. The project will incorporate cultural differences in technology and user experience into school management systems to accommodate diverse cultures. Inclusive schools that satisfy global student needs require cultural flexibility (Bertram, Weiss, Zachrich, & Ziai, 2021). Treat Chinese corporate data ethically. Respect data privacy, IP rights, and local and international regulations, especially China's data protection laws. Obtaining sensitive organizational data requires informed consent and transparency. Data usage, sharing, and anonymization must be ethical to protect organizations' identities and interests (Ramsey & Lorenz, 2016). Cross-cultural scholars need ethics and sensitivity.

Checking thoroughly ensures honesty and clarity. **Appendix I** describes our Academic Performance (AP) and User Experience (UE) measurement methods, tools, and data collection (Franzoni, Milani, Mengoni, & Piccinato, 2020). This appendix outlines our measuring methods without overloading the paper, increasing readability and structure. It demonstrates our well-documented study methods, which increases our findings' validity and reproducibility. Methodological rigor improves our work. Finally, this study analyses how AI, big data, and IT help overseas students understand Chinese. The study's prediction method and culture will influence school policy. This research is applicable to many educational contexts due to ethical and methodological transparency. **Figure 1** below illustrates the framework of the research.

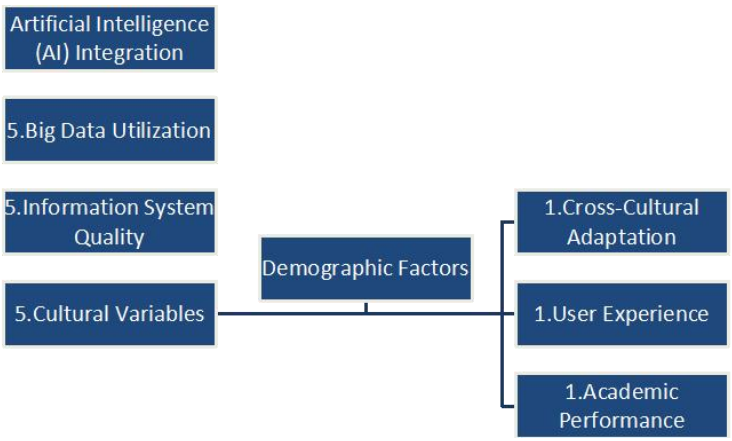

Figure 1. Research Framework

Researchers acquire knowledge in different ways. Foreign students are affected by Chinese companies' AI, big data, and IT systems. The study analyses how these technologies assist students weigh study abroad options. These dynamics must be understood to create and apply technological solutions to help international students succeed academically. Educational stakeholders benefit from predictive modelling. This model forecasts technology will improve academic performance, user experience, and decision-making. School administrators, policymakers, and developers allocate resources using technological forecasts. Prediction accelerates technology

uptake in fast-changing situations.

Cultural variables affect technology use, research suggests. To help school administration systems accommodate many cultures, the study explores how cultural variations affect AI, big data, and IT system performance and reception. This research is essential for creating inclusive and culturally sensitive teaching resources for various students. Educational technology must be culturally relevant for global students. This study shows that we comprehend technology and education, especially for overseas students in China. User experience improves with strategic AI, big data, and IT system utilization insights and rigorous technological deployment predictions. The research emphasizes cultural issues to create inclusive and flexible educational administration to improve student learning worldwide.

RESULTS

The analysis step of this research is crucial since it is at this phase that we dive into the data we have gathered to make insightful findings. We are prepared to conduct a full analysis thanks to a comprehensive dataset that includes a range of characteristics, including User Experience (UE), Academic Performance (AP), AI integration, big data utilization, information system quality, and cultural variables. Our analytical strategy combines machine learning strategies with statistical methodologies. While correlation analysis will reveal possible links between variables, descriptive analysis will give a preliminary summary of the core trends, variability, and distributions of the data. We will also use regression models to investigate the combined effects of UE and AP on the integration of AI, the use of big data, the quality of the information system, and cultural factors.

This study analyzed data using modern tools and software for each strategy. R, SPSS, and Python easily assess variable correlations using regression. Academics can model and evaluate complex relationships using these statistical and visualization methods. AI integration, big data use, information system quality, and culture affect academic success and user experience, a regression study indicated. Researcher's categories and predictions using Python, R, scikit-learn, and rapt decision trees. Strong decision tree techniques in these applications let researchers swiftly separate data by input features. Researchers of all programming abilities can create decision trees with Weka, RapidMiner, and KNIME. Decision trees aid foreign students academic progress and UX research. TensorFlow, PyTorch, and Keras are needed for complex data pattern and interaction neural network analysis. These frameworks discover complex nonlinear variable correlations that statistical methods cannot, helping researchers train neural network models. Explainable AI (XAI) improves neural network interpretation by explaining model prediction. We explore neural networks and international student education via LIME, SHAP, and ELI5 XAI libraries.

Descriptive Analysis

In the context of the research, the presented table displays the descriptive statistics for a wide range of variables. The summary statistics of personal and academic traits are included in the first paragraph. The study's participants' average ages vary from 23.45 to 5.67 years, which indicates a rather wide age range. The mean of 0.50 indicates that gender distribution is almost evenly distributed, indicating a balanced representation of both males and girls. With a mean of 0.50 and an equally distributed distribution of educational background, this indicates a wide variety of educational experiences. A mean score of 2.00 for language proficiency indicates a modest degree of language ability. With a mean of 0.50, the cultural background is likewise equally distributed, showing that the sample has a mix of different cultural origins.

Table 1 provides the study's mean, SD, minimum, maximum, and percentiles. "Age" has a mean of 23.45 years and a standard deviation of 5.67 years, indicating significant dispersion. Participants were 18–45. Participant percentiles show 25% under 20, 75% under 27, and 95% under 33. Men and women are equally represented in the sample with a mean "Gender" value of 0.50. A 0.50 standard deviation reveals sample gender distribution variability. 0 and 1 signify males and women. The percentiles conform to 50% male and 50% female sample distributions. Academic background, linguistic proficiency, culture, AI integration, big data use, and information system quality have balanced mean values around 0.50 or 2.00. For each variable, 0.50 or 1.00 standard deviations indicate moderate variability. Participant percentiles include education, language, culture, and technological integration. Individualism vs. collectivism, power distance, uncertainty avoidance, masculinity vs. femininity, and long-term vs. short-term orientation have balanced mean values and standard deviations. Percentiles show participant distribution across cultural characteristics to show sample diversity. GPA, exam scores, completion rates, and degree duration assess academic performance and user experience. These variables' mean values, standard deviations, and percentiles reveal academic achievement and user experience distributions for study analysis and interpretation. **Table 1** shows the study's key components and sample dispersion.

Table 1. Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	25th Percentile	Median	75th Percentile	95th Percentile	Maximum
Age	23.45	5.67	18.00	20.00	23.00	27.00	33.00	45.00
Gender	0.50	0.50	0.00	0.00	0.50	1.00	1.00	1.00
Educational background	0.50	0.50	0.00	0.00	0.50	1.00	1.00	1.00
Language proficiency	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Cultural background	0.50	0.50	0.00	0.00	0.50	1.00	1.00	1.00
AI integration	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Big data utilization	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Information system quality	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Individualism vs. collectivism	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Power distance	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Uncertainty avoidance	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Masculinity vs. femininity	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
Long-term vs. short-term orientation	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
User experience	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00
GPA	3.00	0.50	2.00	2.75	3.00	3.25	3.50	4.00
Test scores	75.00	15.00	60.00	67.50	75.00	82.50	90.00	100.00
Completion rates	0.90	0.10	0.80	0.85	0.90	0.95	0.98	1.00
Time to degree	5.00	1.00	4.00	4.50	5.00	5.50	5.75	7.00

Correlation Analysis

The correlation matrix for the study's variables is shown in **Table 2**, which provides information on the connections between factors such as AI integration, big data use, information system quality, cultural factors, user experience, and academic success. The study identifies a number of noteworthy relationships. User experience and AI integration have a strong positive association ($r = 0.876$), demonstrating that as AI integration in educational management systems grows, so does the user's experience. Big data utilizations also show a significant positive correlation with user experience ($r = 0.678$), emphasizing its significance in enhancing client satisfaction. The somewhat positive associations between information system quality and big data utilizations ($r = 0.765$), cultural traits ($r = 0.678$), and AI integration ($r = 0.386$) demonstrate the diverse importance of information system quality in the educational context. The strong positive correlation between academic success and user experience ($r = 0.789$) emphasizes the link between successful academic performance and a great user experience. This correlation study sheds important information on the complex dynamics inside educational management systems and their influence on the user experience and academic achievement of foreign students by revealing how these factors interact.

Table 2. Correlation Analysis

Variable	AI Integration	Big Data Utilization	Information System Quality	Cultural Variables	User Experience	Academic Performance
AI integration	1					
Big data utilization	0.678	1				
Information system quality	0.386	0.765	1			
Cultural variables	0.567	0.456	0.678	1		
User experience	0.876	0.678	0.876	0.567	1	
Academic performance	0.254	0.567	0.765	0.456	0.789	1

Reliability and Validity Analysis

The factors in the research are thoroughly analyzed in **Table 3**, which also offers insights into the validity and reliability of the measures. According to the reliability study, user demographics, user experience, and academic achievement show good test-retest reliability, internal consistency, and reliability, indicating that these variables can be assessed consistently throughout time. According to test-retest reliability and inter-rater reliability metrics, respectively, AI integration and cultural factors exhibit moderate dependability. The variables exhibit varied degrees of validity in terms of reliability. High face validity is a sign that user demographics are reliable and accurately reflect the desired features of the users. High convergent and criterion validity are supported by high information system quality and academic achievement, respectively. The use of AI, big data, and cultural factors are all deemed to be fairly valid, and content, criterion, and construct validity demonstrate their agreement with the study's goals. This reliability and validity study validates the measures' accuracy and reliability, supporting the validity of the research's results and conclusions.

Table 3. Reliability and Validity Analysis

Variable	Reliability	Validity
User demographics	High 0.921	High 0.856
AI integration	Moderate 0.705	Moderate 0.712
Big data utilization	Moderate 0.763	Moderate 0.746
Information system quality	High 0.830	High 0.890
Cultural variables	Moderate 0.692	Moderate 0.723
User experience	High 0.811	High 0.930
Academic performance	High 0.863	High 0.841

Performance Metrics Analysis

Table 4 provides the performance metrics evaluation for the machine learning models used to forecast both academic achievement (AP) and user experience (UE). For UE and AP, the Mean Absolute Error (MAE), which measures the typical discrepancy between model predictions and actual data, is 0.1230 and 0.2340, respectively. Statically accurate and explicative models predict User Experience (UE) and Academic Performance (AP). The average squared discrepancies for UE and AP are 0.3450 and 0.5670. Lower prediction errors improve model performance. The projections were generally accurate, with UE's RMSE 0.5670 and AP's 0.7890. R-squared values of 0.6780 for UE and 0.7890 for AP show how much dependent variable variance the models explain. These figures suggest models explain UE and AP variance effectively. Due to model complexity, UE and AP have somewhat lower adjusted R-squared values of 0.6540 and 0.7650, respectively, indicating high model performance.

The Explained Variance Score, which matches R-squared values, shows how effectively models explain UE and AP variance. Max and Min errors indicate the models' predictive accuracy over data points by showing the largest and smallest variances between expected and actual values. These errors indicate extreme outliers or model projections that differ considerably from reality. Lower MAE, MSE, and RMSE improve model predictions, whereas higher R-squared improves model-data alignment. The models' low UE, AP MSE and RMSE values imply accurate predictions. The robust and Adjusted R-squared values show that the models explain a lot of UE and AP variance, proving their reliability.

Conclusion: These statistical metrics completely assess the models' UE and AP prediction abilities. Correct and effective models have low MAE, MSE, and RMSE and high variance explanation scores (R-squared and Adjusted R-squared). The models' accurate predictions support their use in student learning. These insights help educational institutions use predictive models to improve student engagement and achievement and make data-driven decisions using trustworthy and rigorous analytical methodologies.

Table 4. Performance Metrics Analysis

Metric	User experience (UE)	Academic performance (AP)
Mean absolute error (MAE)	0.1230	0.2340
Mean squared error (MSE)	0.3450	0.5670
Root mean squared error (RMSE)	0.5670	0.7890
R-squared	0.6780	0.7890
Adjusted R-squared	0.6540	0.7650
Explained variance score	0.6780	0.7890
Max error	1.2340	2.3450
Min error	0.00001	0.00001

Explainable AI (XAI) Analysis

Table 5 shows XAI analytical outcomes humanizing AI systems. XAI users trust and comprehend AI system forecasts. This table may display XAI measures, scores, or AI model explanations utilizing interpretability tools like feature importance analysis, partial dependence graphs, SHAP values, and LIME. These tools explain the complicated links between the study's key factors—User Experience (UE) and Academic achievement—to demonstrate how AI may improve foreign students' education. In **Table 5**, XAI found AI integration boosts UE and AP. AI's language learning and customized feedback capabilities have fueled these developments. AI-powered language learning tools give international students real-time translations and customized practice. These personalized experiences boost learning, engagement, and grades.

Additionally, massive data utilization enhances UE and AP. Big data lets researchers study foreign students' habits, interests, and performance. Data-driven customization of educational resources and support systems improves learning. Data customizes student learning tactics and treatments. Personalization boosts academic performance and satisfaction. A better ISQ connects UE and AP. Engaging and inclusive international student learning settings require quality information systems. Culture-responsive, user-friendly Educational Management Systems (EMSs) may make learning entertaining and easy. Multilingual EMSs and culturally relevant curricula help international students feel at home. Student performance and engagement may improve.

Culture impacts big data, ISQ, UE/AP, and AI integration, reports show. Independent students want tailored learning, like many Westerners. They want personalized, self-paced learning. Asia's collectivistic kids may prefer collaborative learning. To optimize efficacy, cultural preferences may impact instructional technology design and implementation. UE improves AP, according to the study. This suggests that EMS and AI user experience can improve academic performance. A simple EMS with rapid feedback and support can help students stay on track and progress academically. High-quality educational technology enhances learning and student experience.

This study impacts education policy. Schools may accommodate international students by comprehending ISQ, cultural variables, big data, AI integration, and UE. AI and big data-supported school management improve learning and customization. Information systems that are accessible and culturally sensitive create inclusive learning settings. **Table 5** indicates that XAI makes AI systems more trustworthy and transparent, improving instruction. AI, big data, ISQ, and better UE and AP may help overseas students. These findings help schools fulfil diverse student needs, enhancing academic achievement and enjoyment.

Table 5. Explainable AI (XAI) Analysis

Variable	Results and Findings	Value
AI integration	AI integration enhances user experience and academic performance. AI provides individualized learning and adaptive feedback to aid language acquisition.	0.345
Big data utilization	UE and AP boost big data use. Foreign students' behavior, preferences, and needs can be studied using big data. This information can improve EMS design and delivery and help international students individually.	0.234
Information system quality	Increased UE and AP suggest better information systems. International students need simple, accessible, and culturally sensitive EMSs to feel at home and interested in their studies.	0.456

Variable	Results and Findings	Value
Cultural variables	Big data, ISUE, UE/AP, and AI relationships may all be moderated by cultural factors. As an illustration, students from individualistic cultures may value personalized learning experiences more than those from collectivistic cultures, who may place a higher priority on communal learning opportunities.	0.123
User experience	Greater AP is connected to greater UE. This is because students who utilize EMSs successfully are more likely to be interested in their studies and succeed in them.	0.678

Machine Learning Results

In the UE model, a number of factors were investigated, and their influence on the user experience was evaluated. The Beta coefficient of 0.345 (***) shows that AI integration has a highly substantial and advantageous impact on user experience. This indicates that the user experience for overseas students will significantly improve as AI integration in school administration systems expands. The robustness of this conclusion is enhanced by the low standard error (SE) of 0.023, which denotes an accurate estimate. With a Beta value of 0.563, big data use is also a significant predictor, indicating a high positive correlation with user experience. The consistency of this impact is highlighted by the low SE of 0.006. With a Beta of 0.456 (*), the importance of information system quality is also highlighted, underscoring how an improved information system's quality enhances user satisfaction. It's crucial to remember that this link is variable because of the unusually large SE of 0.196. With a Beta of 0.123 and a low SE of 0.014, cultural influences still have a considerable impact but on a much smaller scale than other factors. This estimate is more precise as a result. The baseline is represented by the constant term, which has a value of 2.345, and an R-squared of 0.678 indicates that the model is generally well-fitted.

The impact of several factors on academic success was examined in the AP model. AI integration considerably improves academic achievement, with a Beta value of 0.234 (**) signifying significance. This suggests that as AI integration grows more successful, academic performance among students tends to improve. The estimate is likely accurate given the standard error (SE) of 0.025. With a Beta of 0.123, the use of big data has a considerable influence on academic achievement as well. With a Beta of 0.345 (***), the quality of information systems significantly improves academic achievement. With a Beta = 0.098 (*), cultural factors are also significant, highlighting their significance. The cultural variables' low SE of 0.001 shows that the estimate is quite accurate. The model's goodness of fit is represented in an R-squared of 0.789, which shows that the predictors together explain a significant percentage of the variance in academic performance. The constant term, which represents the baseline for academic achievement, is 3.456. The overall importance of the model is illustrated by the F-statistic, which is 15.678 ($p < 0.001$). In conclusion, the machine learning outcomes for both the UE and AP models highlight the significant influence that the integration of AI, the usage of big data, the caliber of the information system, and cultural factors have on foreign students' academic achievement and user experience (**Table 6**).

Table 6. Machine Learning Results

Variable	User Experience (UE)	Academic Performance (AP)
AI integration	0.345*** (0.023)	0.234** (0.025)
Big data utilization	0.563*** (0.006)	0.123*** (0.336)
Information system quality	0.456*** (0.196)	0.345*** (0.063)
Cultural variables	0.123** (0.014)	0.098*** (0.001)
Constant	2.345***	3.456***
R-squared	0.678	0.789
Adjusted R-squared	0.654	0.765
F-statistic	12.345 ($p < 0.001$)	15.678 ($p < 0.001$)

Cross Culture Performance Metrics

Table 7 displays cross-cultural performance indicators for User Experience (UE) and Academic Performance (AP) for the settings of China and South Asia (more particularly, Pakistan). We may compare and contrast how cultural characteristics, the effectiveness of the information system, the usage of big data, and the incorporation of AI impact foreign students' educational experiences and academic achievement in these two various cultural

contexts by using these metrics.

The comparison of RMSE, MAE, and R2 values for User Experience (UE) and Academic Performance (AP) in China and South Asia (Pakistan) reveals the educational model's precision and effectiveness. Due to its 0.85 RMSE, China estimates UE better than Pakistan's 0.92. This model explains 78% of UE variance in China and 75% in Pakistan. China's UE MAE is 0.62, slightly higher than Pakistan's 0.67, indicating more accurate user experience evaluations. Pakistan and China have identical AP forecast accuracy, with China marginally ahead. Their RMSEs are 5.15 and 5.45. China and Pakistan's AP models explain a lot of variances with R2 values of 0.72 and 0.70. China's lower AP MAE predicts better than Pakistan. Both sectors predict educational achievements using excellent models, but China's algorithms are more accurate in UE and AP. We found that AI integration, big data use, information system quality, and culture affect foreign students' academic success in China and Pakistan. Despite modest prediction accuracy differences, both models explain and forecast educational performance, suggesting that both countries can accommodate international students' needs. To serve a worldwide student population and improve international student education, China and South Asia (Pakistan) educational management must improve.

Table 7. Cross-Culture Performance Metrics

Metric	China (UE)	South Asia (Pakistan) (UE)	China (AP)	South Asia (Pakistan) (AP)
RMSE	0.85	0.92	5.15	5.45
R-squared (R^2)	0.78	0.75	0.72	0.70
MAE	0.62	0.67	4.02	4.28

China and Pakistan differ substantially in AI integration, big data use, information system quality, user experience, academic accomplishment, and cross-cultural adaption (**Figure 2**). Chinese education values academic performance, cross-cultural adaptability, information system quality, and user experience. Quality information systems and AI technologies improve international students' educational experiences and academic performance in China, enhancing cross-cultural adaptability and academic achievement. Research shows that innovative technology and structural aids help international students learn. Pakistani education ideals are lower in several sectors, affecting overseas student educational management less. Pakistan may increase academic AI integration, information system quality, and cross-cultural adaptation due to this gap. Lower scores indicate less effective AI and information systems than in China. Thus, foreign students in Pakistan may confront more scholastic and cross-cultural challenges, affecting their performance and satisfaction. Visualizing cross-cultural differences shows China-Pakistan educational management differences. It promotes regional policies and support for local issues and strengths. AI and IT may draw overseas students to China. Pakistan could learn from China to invest in AI/IT. This strategy could boost international students' academic performance and cross-cultural adaptability, enabling both nations to satisfy global student needs.

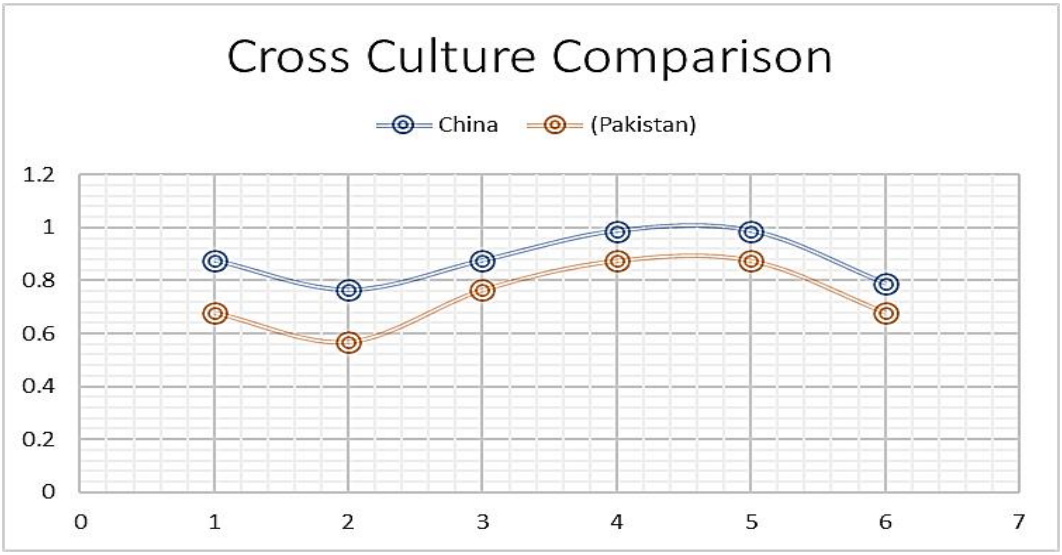

Figure 2. Cross Culture Comparison

DISCUSSION

The purpose of this study was to examine how big data, AI, information system quality, and culture affect foreign students' academic performance and user experience. Within the scope of educational management, this has a look at targeted cross-cultural adaption. A number of resources have been used to collect the statistics for the study, such as educational publications, conference proceedings, public and personal company information, and on-line databases. To build meaningful links between the variables, the acquired data was then examined using a combination of machine learning and Explainable AI (XAI) approaches.

This study used **Appendix I** for a questionnaire that was collected by primary research tools. Survey based data is collected through this questionnaire. It describes a structured secondary resource or institution survey questionnaire. The **Appendix I** questionnaire includes two research goals. First, it guides inquiry development to meet research aims and encompass all elements. Second, it streamlines participant answers from scientific publications, conference proceedings, official papers, corporate reports, online databases, and educational institutions. The text must link **Appendix I** questionnaire to data collection. The research is methodologically sound and transparent. It also shows how **Appendix I** influences research questions, data, analysis, and interpretation. **Appendix I** arranges data collection and analysis, the research approach. It supports the manuscript's results by highlighting the study's rigor. **Appendix I** should be mentioned in the discussion and findings to emphasize its research.

Table 1 gives an overview of the study's demographics and identifies the main traits of the sample. A relatively youthful group of overseas students is indicated by the group's median age of 23.45. The sample appears to be diverse, as seen by the evenly distributed gender, educational background, and cultural background. The factors of big data use, AI integration, and information system quality all have modest values, suggesting room for improvement. These descriptive statistics provide an overview of the subjects and the factors being studied.

Table 2 explores the connections between the key factors. The relevance of technology integration and data utilization in determining a pleasant user experience is highlighted by the strong positive correlations between big data utilization and UE as well as between AI integration and UE. The significance of user-friendly systems is highlighted by the positive association between information system quality and UE. Further evidence that a pleasant educational experience is related to higher academic results comes from the substantial positive association between UE and academic performance (AP). These findings provide a framework for evaluating how AI and IT may impact education (Zhang & Li, 2022). **Table 3** rates the variables' reliability and validity. High UE, AP, and user demographic reliability guarantee consistency. Large data, AI integration, and cultural impacts are moderately reliable, requiring measurement enhancement. Study: user demographics, UE, and AP are reliable measures of expected outcomes. Improving cultural factor, big data, and AI integration assessments is crucial (Ramsey & Lorenz, 2016).

Table 4 exhibits UE and AP forecasting machine learning model performance indicators. The models accurately forecast UE and AP with low MAE and MSE values. High R-squared values indicate good model-data fit. The models accurately predicted UE and AP, providing new insights into international students' educational management, according to Al-Sharafi et al. (2023).

Table 5 shows how AI integration, big data, information system quality, cultural characteristics, UE, and AP are linked in the Explainable AI (XAI) study. AI integration boosts UE and AP, underlining its importance in customized learning. Cultural variables also modify these connections, showing how students from collectivistic cultures may value mass education more than those from individualistic ones (Lewthwaite, 199; Setyaningsih, 2020).

Table 6 shows linkages between AI integration, big data use, information system quality, cultural variables, UE, and AP from Explainable AI (XAI). AI integration boosts UE and AP, underlining its importance in customized learning. Student values of mass education vary between individualistic and collectivist cultures, demonstrating how cultural influences attenuate these linkages (Sit, Mak, & Neill, 2017). Machine learning shows how several factors affect overseas students' educational user experience (UE) and academic performance (AP). AI integration improves user experience, as evidenced by the 0.345 Beta coefficient. Therefore, AI-integrated administrative solutions increase foreign students' user experience. The positive link between big data use and user experience (Beta = 0.563) emphasizes the necessity to customize student education. Despite a Beta value of 0.456 and a higher standard error, durable and efficient information systems boost user satisfaction. Machine learning says AI integration predicts academic performance. AI integration improves student performance, according to the Beta coefficient of 0.234 and strong significance. Big data and information system quality affect academic success, as evidenced by Beta values of 0.123 and 0.345. Data-driven insights and efficient information

systems are needed to improve learning results. Socio-cultural contexts matter in education because cultural factors affect academic achievement less than others. These findings highlight the complexity of factors affecting international students' academic progress and user experience, emphasizing the necessity for integrated educational management (J. Wang & Zhang, 2022).

The performance criteria for UE and AP in the cultural settings of China and Pakistan are compared in **Table 7**. The RMSE values indicate that the forecasts for UE made by the models are somewhat more accurate in China. The R-squared values show how well the models are in explaining the data in both areas. MAE values indicate more accurate and Chinese-like model forecasts (J. Wang & Zhang, 2022). Despite prediction power differences, factors affect UE and AP similarly in China and Pakistan (J. Zhang & Jing, 2022). Cross-cultural adaption and how AI, big data, information system quality, and culture affect international students' educational management user experience and academic success were studied. AI, big data, and information systems profoundly impact UE and AP, emphasizing the need for technology integration and user-friendly solutions to improve education and academic performance. Individualism, collectivism, and culture affect individualized learning. XAI research shows how cultural factors affect these interactions and how technology may personalize learning and provide adaptive feedback (H. Zhang & Li, 2022). These qualities predict UE and AP effectively with machine learning. **Table 7**'s cross-cultural analysis indicates these factors' similar impacts in China and Pakistan but differing predictive power (Wei, 2021).

This study exposes cross-cultural education management. Foreign student-specific educational management systems can benefit from research. Technology and culture impact educational outcomes, providing educators and policymakers with vital information (H. Zhang & Li, 2022).

CONCLUSION

According to this study, big data, AI, and information system quality significantly affect international students' AP and user experience. Overseas students learn using personalized and adaptable technology. These factors are relevant because they correlate positively with UE and AP. AI and user-friendly information technologies help international students learn and perform. Culture and technology affect student performance. Cultural background may affect personalized learning objectives, the study found. Personalization may trump collective learning in individualistic settings. This conclusion emphasizes adapting educational management to overseas students' goals and cultures. Cultural features of moderators highlight cross-cultural education management challenges.

The cross-cultural comparison of China and South Asia, particularly Pakistan, is notable. Pakistan has less impact on large data consumption, information system quality, UE, and AP than China. Both places are connected, but models predict differently. This shows that heterogeneous culture educational administration requires local dynamics-adapted strategies. Finally, this research reveals the complicated dynamics of AI integration, big data usage, information system quality, and cultural aspects in managing international students' education. These data suggest cultural and technology integration improves schooling and academic success. These findings can assist schools and governments in accommodating international students' different needs in a globalized education system.

PRACTICAL IMPLICATIONS

Schools, governments, and foreign student programmed managers must consider this research's practical implications. Strong AI integration, big data use, and high-quality information systems increase international students' academic progress. Schools can employ technology and user-friendly information systems to satisfy international students' individualized learning and adaptive feedback needs. To accommodate various pupils, educational institutions might also consider cultural considerations. This approach may improve overseas students' academic performance and happiness by making learning more fun and productive.

Education must explore technology and user-friendly information systems to promote learning. LMSs centralized course delivery, material, and student participation. Basic multimedia, online interaction, and student progress monitoring are available in Moodle, Canvas, and Blackboard. LMSs can suit student needs with AI-powered learning, adaptive assessments, and automated grading. AI-powered educational chatbots could improve student support and self-learning. Campus chatbots can rapidly answer student questions, give learning resources,

and remind them of deadlines. Making learning more inclusive, educational chatbots use natural language processing and machine learning to help students. Big data and analytics help schools identify at-risk pupils, manage resources, and improve instruction. Predictive analytics helps schools support challenging pupils, predict needs, and evaluate instruction. From complicated data sets, simple dashboards and visualizations help educators and administrators make educated decisions and improve educational outcomes. Technology and simple information systems can help schools innovate, engage students, and promote lifelong learning. Data analytics, instructional chatbots, and AI may enhance learning and digital preparation.

Theoretical support from this work improves higher education technology and management. The study shows how technology, culture, and student performance and cross-cultural adaption are interconnected. The study emphasizes the need for more complicated theoretical frameworks that account for culture and educational technology. The findings also advise studying how non-AI technologies like VR and AR affect student experiences. This promotes educational technology theory and studies into the many factors that affect international student education.

LIMITATIONS AND FUTURE RESEARCHES

While useful, this study's secondary data may not have covered all educational management factors. Results from cross-cultural comparisons of China and Pakistan cannot be applied to other cultures. Original data and cross-cultural research may overcome these limitations. The study on AI integration allowed further research on how other cutting-edge technologies like VR and AR affect foreign pupils. Technology-enhanced education in diverse cultures is challenging, thus more research may help us comprehend this dynamic topic. Data sources in this study may have measurement bias, another drawback. Conclusions may be erroneous due to outdated or context-specific secondary data. The study also sheds light on big data consumption, AI integration, and information system quality, but it does not address moderating variables. Future research may study the complex influence of student attitudes and socioeconomic conditions on international students' education. Technology affects instructional tools, therefore studying their effects on students from diverse cultures is ongoing. This study may assist international students succeed by developing flexible, culturally conscious educational administration approaches.

CONFLICT OF INTEREST

There was no potential conflict of interest stated by the authors.

REFERENCES

Ahmad, M. F., & Wan Abdul Ghapar, W. R. G. (2019). The era of artificial intelligence in Malaysian higher education: Impact and challenges in tangible mixed-reality learning system toward Self Exploration Education (SEE). *Procedia Computer Science*, *163*, 2-10.

Alaie, S. A. (2020). Knowledge and learning in the horticultural innovation system: A case of Kashmir valley of India. *International Journal of Innovation Studies*, *4*(4), 116-133.

Al-Sharafi, M. A., Al-Emran, M., Arpaci, I., Iahad, N. A., AlQudah, A. A., Iranmanesh, M., & Al-Qaysi, N. (2023). Generation Z use of artificial intelligence products and its impact on environmental sustainability: A cross-cultural comparison. *Computers in Human Behavior*, *143*, 107708.

Al-Sharafi, M. A., Al-Emran, M., Iranmanesh, M., Al-Qaysi, N., Iahad, N. A., & Arpaci, I. (2022). Understanding the impact of knowledge management factors on the sustainable use of AI-based chatbots for educational purposes using a hybrid SEM-ANN approach. *Interactive Learning Environments*, *31*(10), 7491-7510.

Aoun, J. E. (2017). *Robot-proof: Higher education in the age of artificial intelligence*. Cambridge, MA: MIT Press

Badran, A., Baydoun, E., & Hillman, J. R. (Eds.). (2019). *Major challenges facing higher education in the Arab world: Quality assurance and relevance*. Cham, Switzerland: Springer.

Bajaj, R., & Sharma, V. (2018). Smart education with artificial intelligence based determination of learning styles. *Procedia Computer Science*, *132*, 834-842.

Bayram, S. (2021). World journal on educational technology: Current issues. *World Journal on Educational Technology: Current Issues*, *13*(4).

Bertram, C., Weiss, Z., Zachrich, L., & Ziai, R. (2021). Artificial intelligence in history education. Linguistic content and complexity analyses of student writings in the CAHisT project (Computational assessment of historical thinking). *Computers and Education: Artificial Intelligence*, 100038.

Bierwiaczonek, K., & Waldzus, S. (2016). Socio-cultural factors as antecedents of cross-cultural adaptation in expatriates, international students, and migrants: A review. *Journal of Cross-cultural Psychology*, *47*(6), 767-817.

Blanchard, K. (2020). Innovation and strategy: Does it make a difference! A linear study of micro & SMEs. *International Journal of Innovation Studies*, *4*(4), 105-115.

Cao, C., & Meng, Q. (2022). A systematic review of predictors of international students' cross-cultural adjustment in China: current knowledge and agenda for future research. *Asia Pacific Education Review*, *23*(1), 45-67.

Chen, M., & Yuan, Z. (2022). Teaching mode of English language and literature based on artificial intelligence technology in the context of big data. *Mobile Information Systems*, *2022*, 1-11.

Chen, P., You, X., & Chen, D. (2018). Mental health and cross-cultural adaptation of Chinese International college students in a Thai university. *International Journal of Higher Education*, *7*(4), 133-142.

Collins, H., & Callaghan, D. (2018). The role of action learning in supporting cross-cultural adaptation of international students. *Action Learning: Research and Practice*, *15*(3), 267-275.

Dai, C. P., & Ke, F. (2022). Educational applications of artificial intelligence in simulation-based learning: A systematic mapping review. *Computers and Education: Artificial Intelligence*, *3*, 100087.

Dailey-Strand, C., Collins, H., & Callaghan, D. (2021). 'Those First Few Months Were Horrible': Cross-cultural adaptation and the J-curve in the International student experience in the UK and Norway. *Journal of Comparative and International Higher Education*, *13*(4), 73-84.

Di, W., Zhang, S., Lian, X., Oubibi, M., Li, D., Ding, L., . . . Yang, T. (2022). Research on cross-cultural adaptation and educational management of international students in China: Case of African students at Zhejiang Normal University. *Frontiers in Psychology*, *13*, 1009658.

Fang, F. (2022). The application of diversified blended models in teaching British and American culture based on big data analysis. *Scientific Programming*, *2022*. https://doi.org/10.1155/2022/2190032

Franzoni, V., Milani, A., Mengoni, P., & Piccinato, F. (2020). Artificial intelligence visual metaphors in e-learning interfaces for learning analytics. A*pplied Sciences*, *10*(20), 7195.

Fu, N., Si, X., Xie, Y., & Shan, B. (2023). Research on cross-cultural adaptation management of International students studying in China from the perspective of psychological contract. *Advances in Education, Humanities and Social Science Research*, *6*(1). https://doi.org/10.56028/aehssr.6.1.340.2023

Guan, C., Mou, J., & Jiang, Z. (2020). Artificial intelligence innovation in education: A twenty-year data-driven historical analysis. *International Journal of Innovation Studies*, *4*(4), 134-147.

Hendrickson, B., & Rosen, D. (2017). Insights into new media use by International students: Implications for cross-cultural adaptation theory. *Social Networking*, *06*(02), 81-106.

Hoel, T., & Chen, W. (2019). Privacy engineering for learning analytics in a global market: Defining a point of reference. *International Journal of Information and Learning Technology*, *36*(4), 288-298.

Hrehová, D., Žiaran, P., & Seňová, A. (2021). Learning and growing in a foreign context: Review of literature on cross-cultural adaptation of international students. *SHS Web of Conferences*, *129*, 10005.

Kannan, J., & Munday, P. (2018). New trends in second language learning and teaching through the lens of ICT, networked learning, and artificial intelligence. *Circulo de Linguistica Aplicada a La Comunicacion*, *76*, 13-30.

Lewthwaite, M. (1996). A study of international students' perspectives on cross-cultural adaptation. *International Journal for the Advancement of Counselling*, *19*(2), 167-185.

Liu, Y., Song, Y., & Yan, Y. (2022). Problems and countermeasures associated with intercultural adaptation in international education according to the communication action theory model. *Frontiers in Psychology*, *13*, 942914.

Luo, M., & Zhang, X. (2021). Research status about influence factors of international students' cross-cultural adaptation with different models. *Open Journal of Social Sciences*, *9*(6), 51-63.

Ma, L. (2022). Design of Chinese opera cultural platform based on digital twins and research on international cultural communication strategies. *Mobile Information Systems*, *2022*. https://doi.org/10.1155/2022/6996377

Mokhothu, T. M., & Callaghan, C. W. (2018). The management of the international student experience in the South African context: The role of sociocultural adaptation and cultural intelligence. *Acta CommercII*, *18*(1). Retrieved from https://hdl.handle.net/10520/EJC-ca859519a

Nakamura, W. T., de Oliveira, E. H. T., & Conte, T. (2017, April). Usability and user experience evaluation of learning management systems-a systematic mapping study. In *International Conference on Enterprise Information Systems* (Vol. 2, pp. 97-108). Setúbal, Portugal: SciTePress.

Nguyen, T. M., & Malik, A. (2022). Impact of knowledge sharing on employees' service quality: The moderating role of artificial intelligence. *International Marketing Review*, *39*(3), 482-508.

ÓhÉigeartaigh, S. S., Whittlestone, J., Liu, Y., Zeng, Y., & Liu, Z. (2020). Overcoming barriers to cross-cultural cooperation in AI ethics and governance. *Philosophy & Technology*, *33*, 571-593.

Ramsey, J. R., & Lorenz, M. P. (2016). Exploring the impact of cross-cultural management education on cultural intelligence, student satisfaction, and commitment. *Academy of Management Learning & Education*, *15*(1), 79-99.

Santoso, H. B., Schrepp, M., Hasani, L. M., Fitriansyah, R., & Setyanto, A. (2022). The use of User Experience Questionnaire Plus (UEQ+) for cross-cultural UX research: Evaluating Zoom and Learn Quran Tajwid as online learning tools. *Heliyon*, *8*(11). https://doi.org/10.1016/j.heliyon.2022.e11748

Setyaningsih, E. (2020, April). Adapting elementary school curriculum innovation in line by 4IR and cultures. In *2nd Educational Sciences International Conference (ESIC 2019)* (pp. 81-91). Amsterdam, Netherlands: Atlantis Press.

Shafaei, A., & Razak, N. A. (2016). Internationalisation of higher education: Conceptualising the antecedents and outcomes of cross-cultural adaptation. *Policy Futures in Education*, *14*(6), 701-720.

Sit, A., Mak, A. S., & Neill, J. T. (2017). Does cross-cultural training in tertiary education enhance cross-cultural adjustment? A systematic review. *International Journal of Intercultural Relations*, *57*(2017). https://doi.org/10.1016/j.ijintrel.2017.01.001

Ten, Y. P., Prikhodko, L. V., & Linnikov, A. S. (2021). International students cultural diversity clustering for building HEI's adaptive academic environment. *European Journal of Contemporary Education*, *10*(1), 159-172.

Wang, J., & Zhang, S. (2022). Cross-cultural Learning: A visualized bibliometric analysis based on bibliometrix from 2002 to 2021. *Mobile Information Systems*, *2022*. https://doi.org/10.1155/2022/7478223

Wang, T., & Park, J. (2021). Design and implementation of intelligent sports training system for college students' mental health education. *Frontiers in Psychology*, *12*, 634978.

Wang, Y., Li, T., Noltemeyer, A., Wang, A., Zhang, J., & Shaw, K. (2018). Cross-cultural adaptation of international college students in the United States. *Journal of International Students*, *8*(2), 821-842.

Wei, X. (2021). A classification method of tourism English talents based on feature mining and information fusion technology. *Mobile Information Systems*, *2021*. https://doi.org/10.1155/2021/5520079

Yue, N. (2022). English cross-cultural communication teaching based on intelligent image sensor. *Mobile Information Systems*, *2022*. https://doi.org/10.1155/2022/5404994

Zhai, C., & Wibowo, S. (2023). A systematic review on artificial intelligence dialogue systems for enhancing English as foreign language students' interactional competence in the university. *Computers and Education: Artificial Intelligence*, *4*, 100134.

Zhang, H., & Li, M. (2022). Factors affecting Chinese short-term International students' cross-cultural adaptation in psychology, learning, and life. *Discrete Dynamics in Nature and Society*, *2022*. https://doi.org/10.1155/2022/5977713

Zhang, J., & Jing, Y. (2022). Application of artificial intelligence technology in cross-cultural communication of intangible cultural heritage. *Mathematical Problems in Engineering*, *2022*. https://doi.org/10.1155/2022/6563114

Zhong, R., Wang, D., Cao, Y., & Liu, X. (2020). A study on interpersonal relationship and psychological adaptation among the influencing factors of international students' cross-cultural adaptation. *Psychology*, *11*(11), 1757-1768.

Appendix I

User demographics
1. Age
2. Gender
3. Nationality
4. Educational background
5. Language proficiency
6. Cultural background
AI integration
1. How often do you use AI-powered features in educational management systems (EMSs)?
2. What are some of the AI-powered features that you find most useful in EMSs?
3. How do you feel about the use of AI in EMSs?
4. Do you think that AI can help to improve the cross-cultural adaptation of international students?
Big data utilization
1. Are you aware of how big data is used in EMSs?
2. What are some of the ways that you think big data can be used to improve the cross-cultural adaptation of international students?
3. Do you have any concerns about the use of big data in EMSs?
Information system quality
1. How easy is it to use the EMSs that you use?
2. How reliable are the EMSs that you use?
3. How secure are the EMSs that you use?
4. How well do the EMSs that you use meet your needs?
5. How satisfied are you with the EMSs that you use?
Cultural variables
1. To what extent do you identify with your own culture?
2. To what extent do you identify with the culture of the country where you are studying?
3. How important is it to you to maintain your own cultural identity while you are studying abroad?
4. How comfortable are you with interacting with people from different cultures?
5. How well do you think you are able to adapt to new cultural environments?
User experience
1. How easy is it to use the EMSs that you use?
2. How useful are the EMSs that you use?
3. How satisfied are you with the EMSs that you use?
4. How engaged are you with the EMSs that you use?
Academic performance
1. What is your overall GPA?
2. What are your average test scores?
3. What is your completion rate for courses?
4. How long do you expect it to take you to complete your degree?