

 Research Article

AI-Driven Learning Analytics and Student Retention Among International Students in Chinese Universities

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Abstract

Artificial Intelligence (AI) and learning analytics are rapidly reshaping the modern landscape of higher education, impacting academic engagement, personalised learning experiences, and student retention in the learning environment. In recent years, Chinese universities have been more and more implementing AI technologies in education to enhance institutional responsiveness, adaptability, and predictive academic support for students from domestic and abroad. Despite the widespread use of AI in HEIs, there is, however, little qualitative research that has examined the perceptions and experiences of international students in the context of AI-mediated learning environments in Chinese HEIs. Hence, this research aimed to explore how AI-powered learning analytics affects student attrition among international students at Chinese Universities. The study used a qualitative exploratory research design, following an interpretivist paradigm. Twenty-five international students at undergraduate, master's, and doctoral levels at various universities in China were interviewed using semi-structured interviews. Descriptive thematic analysis was applied in the analysis of data in this study, based on the analytical framework of Braun and Clarke. The results indicated that AI learning analytics had a positive impact on academic engagement, educational organisation, adaptation of personal learning, and institutional support, which was enabled by predictive academic monitoring and intelligent feedback systems. In general, the participants considered that the use of AI-supported educational technologies can be beneficial in terms of increasing awareness about learning, participation in learning, and persistence in learning. The research also revealed a number of challenges encountered in cultural adaptation, language barriers, emotional stress, privacy concerns, and digital surveillance in the context of AI in education. The study shows that AI learning analytics, in combination with ethically responsible, culturally inclusive, and human-centred education, can make a significant contribution to international student retention. The results add to the current body of knowledge by offering qualitative insight into the impact of AI-enhanced education in higher education institutions in China.

Keywords: Artificial Intelligence, Chinese Universities, International Students, Learning Analytics, Student Retention, Technology-Assisted Learning

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1. INTRODUCTION

Global higher education has been undergoing a digital transformation at a faster pace than ever before, reshaping the epistemological, pedagogical, and administrative principles of today's universities. Within the past decade or so, the fields of artificial intelligence (AI), machine learning, and learning analytics have come to dominate educational technological perspectives and innovations that impact educational governance, instruction, engagement, and institutional decision-making processes. AI-based educational technologies are increasingly being incorporated in universities around the world within their academic

infrastructure, in order to enrich the educational response, optimise the learning experiences, enable predictive interventions in the academic field, and increase the chances of student retention (Bond et al., 2020; Garzón et al., 2025; Ifenthaler & Yau, 2020; Márquez et al., 2024). This shift has led to the rise of intelligent educational ecosystems that shift higher education from a reactive approach to supporting students to a predictive approach that can identify students at risk of disengagement or attrition before they fall into that hole.

In such a technologically enriched educational context, learning analytics has become an increasingly studied field in the ability to make sense of the large volume of educational data and provide institutional intelligence to inform the learning process, as well as a way to support the decision-making process in its design. LASs are now widely being used to track attendance, participation in online learning, assignment submission, behavioural engagement, and cognitive learning trajectories to get a better picture of early-warning interventions and personalised academic support mechanisms (Ifenthaler & Yau, 2020; Tsai et al., 2018; Viberg et al., 2018). Other studies also reveal that AI-driven learning analytics has the potential to significantly enhance adaptive learning, self-regulated learning behavior, tailored feedback, and student engagement by leveraging algorithmic support systems and intelligent tutoring environments (Chen et al., 2026; Min et al., 2025; Raji et al., 2026). For this reason, AI-based learning analytics is playing an increasing role in institutional strategies for achieving sustainability in education, student success, and learning retention in higher education institutions. AI technologies have shown significant impacts in higher education, especially in the context of education in China. In recent years, China has made significant efforts in the field of educational digitalisation, investing heavily in the development and application of AI-powered pedagogical technologies, smart campus systems, intelligent tutoring platforms, predictive learning systems, and adaptive educational ecosystems (Sun et al., 2026; Zhang et al., 2025). The progress is indicative of the overall national goals of technological innovation, educational modernisation and international academic competitiveness. At the same time, universities in China are becoming more popular with foreign students with a wide range of governmental scholarship programmes, growing transnational educational ties, and internationalisation policies. With the integration of AI in transforming education and the increasing trend of international students going to China, institutions have become more concerned about students' academic engagement, adaptation, wellbeing, and retention, especially for foreign students in China.

While these technologically advanced learning spaces have expanded, students from around the world are still experiencing a variety of academic, sociocultural, linguistic, and psychological issues that could negatively impact their persistence in school and in their university experiences. The existing literature has consistently shown that international students often struggle with communication barriers, cultural disorientation, academic stress, emotional isolation, and difficulties in adapting to different pedagogical systems (Shea et al., 2022). In Chinese higher education institutions, these difficulties are even more likely to be reinforced due to language diversity, the norms of classroom interaction, the students' new digital learning environment, as well as the differences in support provided for international students by the institution. This has led to a growing concern for universities in terms of international student retention, which is crucial for educational inclusiveness, the reputation, and competitiveness of the institution.

To address these concerns, universities are now turning to AI-powered learning analytics to find students at risk, track academic participation, tailor instructional support to the individual, and enhance educational retention. AI-enabled learning platforms have the potential to assess behavioral and academic metrics in real time and prompt institutions to take action on learners who are at risk of academic disengagement or struggling with adjustments (Tsai et al., 2018; Viberg et al., 2018). Furthermore, empirical studies conducted in recent years indicate that AI-powered personalised feedback systems have the potential to positively impact learners' motivation, confidence, adaptive engagement, and participation in learning (Chen et al., 2026; Fan et al., 2025; Liu et al., 2025). Likewise, Ma et al. (2024) stated that the educational value, technological suitability, and teaching effectiveness of AI tools are the three main factors that shape the behavioral intentions of students. Research has also been done in the Chinese education system, which indicates that students are getting more engaged with AI tools for language learning, educational decision-making, and personalised learning support (Arif et al., 2025; Xie et al., 2025). Despite the recent surge of interest and excitement in education and AI transformers in institutions, the current scholarship is still largely technocentric and operationally focused. Researchers have mainly focused on predictive modelling accuracy, algorithmic efficiency, the implementation of technology, system optimisation, and behavioural analytics in contemporary studies about AI in Higher Education (Alfredo et

al., 2024; Garzón et al., 2025; Zawacki-Richter et al., 2019). While these research efforts have contributed greatly to the field of educational technology research, they often overlook the subjective experiences, emotional realities, and sociocultural interpretations of students engaging with AI-supported learning contexts. This imbalance is not only true in research on international students in non-Western higher education settings, but it is also true for qualitative understandings of international student experiences. This means that while AI-based learning analytics has been extensively theorised as a means of institutional efficiency and predictive educational governance, very few studies have sought to explore the perceptions of international students regarding AI surveillance, algorithmic monitoring, digital feedback systems, and technologically mediated academic support systems.

Furthermore, international students are an especially vulnerable population in terms of educational persistence due to the fact that their performance in the education system, as well as their adaptation to the intercultural environment, emotional health and wellbeing, belongingness to the institution, and social integration, are factors that influence their persistence in the education system. Past research indicates that students' interaction with AI technologies is often shaped by their linguistic abilities, digital literacy, cultural norms, and trust in institutions (Ma et al., 2024; Yan et al., 2025). The use of AI-based learning analytics in the international education landscape, therefore, raises key questions of educational equity, technology inclusion, transparency of algorithms, emotional surveillance, and ethical control. While the transformative educational implications of AI technologies are clear, Holmes et al. (2022) highlighted the ethical challenges that arise from the use of these technologies, including concerns about student privacy, data ownership, informed consent, and power imbalances within the educational system. Similarly, Alam (2021) emphasized the potential of rapid growth of AI in education to generate opportunities and fears around technological dependency, surveillance, and educational inequality. These concerns can be especially significant in cross-cultural educational environments where international students may have varying views on institutional power, technology management, and digital surveillance.

In this intellectual and empirical context, this study aims to analyze the potential and impact of AI-LA in influencing student retention of international students in Chinese universities. In contrast to earlier studies that have mostly focused on quantitative approaches or on a technologically determinist perspective, this study takes a qualitative exploratory approach to critically analyze the lived experience, perceptions, and interpretative understandings of interaction between international students and AI-supported educational infrastructures. The study will use semi-structured interviews with 25 international students enrolled in Chinese higher education institutions to gain a context-specific and nuanced understanding of the impact of AI-based learning analytics on academic engagement, institutional support experiences, adaptation processes, and educational persistence.

This study aims to investigate the relationship between AI-based learning analytics and international student retention in Chinese universities from a critical perspective by using the following interrelated research goals: In particular, the study aims to:

- To discuss the perceptions and experiences of international students about AI-based learning analytics in Chinese higher educational institutions.
- To analyse the impact of AI in educational systems on academic involvement, learning motivation, educational satisfaction, and student retention.
- To explore the potential of using AI-powered monitoring and tailored feedback systems to support academic adjustment and academic retention.
- To detect the cultural, technological, emotional, and institutional problems faced by foreign learners in an AI-mediated learning environment.
- To critically assess the ethical considerations of using AI in the monitoring of learning, such as privacy, surveillance, and institutional trust.
- To make recommendations on student-centred, ethically sound, and more inclusive retention strategies in Higher Education that utilise AI.

To this end, the study has adopted the following exploratory research questions to uncover the functional effectiveness of AI-supported educational systems as well as the wider sociocultural and psychological implications for internationally mobile learners. To this end, the study attempts to respond to the following research questions:

1. What are international students' attitudes and experiences towards AI-based learning analytics in Chinese universities?
2. How can AI-driven education systems affect academic involvement, learning outcomes and student retention for international students?
3. What are the implications of AI-driven monitoring systems and customised feedback mechanisms for students' academic adjustment and educational retention?
4. What are some of the cultural, emotional, technological and institutional problems faced by international students in AI-driven learning environments?
5. What are some effective ways to enhance international student retention by developing an ethical, inclusive, and student-centred approach to applying AI tools for learning analytics in universities in China?

The importance of this study lies in both the theoretical and practical aspects and is greatly rooted in the interdisciplinary and human-centred approach. Theoretically, the study adds to the growing literature in the field of AI education and learning analytics, as well as international student mobility and student retention, by providing a qualitatively based and practically grounded analytical perspective which is not widely found in the existing literature. Previous studies have focused on the efficiency of predictive models, optimized algorithms, and the functionality of learning analytics technologies, whereas the current study takes a more complex view of the role of AI in learning analytics, which is a sociotechnical phenomenon deeply connected to identity construction, emotional wellbeing, intercultural adjustment, and educational belongingness of international students. The present study is distinctive and original in that it investigates the human-centred nature of quantitative AI-based learning analysis and analysis of qualitative data from the perspective of international student retention in higher education institutions in China. The focus of previous studies has mainly been quantitative models, efficiency of predictive analytics, and technological implementation frameworks of international students' engagement with AI-assisted educational systems, leaving little scholarship to reflect on their lived experiences, emotional perceptions, and sociocultural interpretations of such systems. This study thus contributes to the literature by moving the analysis from a technological perspective to a more experiential perspective of education, and thus offers an interpretive understanding of the impact of AI learning analytics on academic persistence, institutional belongingness, psychological adaptation, and students' perception of digital surveillance within transnational higher education environments. Moreover, the study provides a context-specific perspective, which is relatively under-studied in current educational technology research, in the context of Chinese universities. By doing so, the research contributes to a more interdisciplinary discussion with the creation of a connection between artificial intelligence, learning analytics, international education, and student retention, which goes beyond the existing scholarly literature, which is mainly focused on Western and only technologically driven approaches.

On a practical level, the study's findings have profound implications for Chinese universities, policymakers, educational technologists, and administrators of foreign student support in China who aim to build ethically responsible and culturally responsive AI systems in higher education. The research can help universities to create more inclusive learning analytics systems that not only measure academic achievement but also take into account emotional, psychological, and intercultural aspects of international students' experiences. Furthermore, the results might help in designing a balanced institutional approach that combines technological innovation with humanised educational support, which will reinforce the engagement, satisfaction, persistence, and long-term educational outcomes of international students in AI-supported educational environments.

1.1. Literature Review

1.1.1. Artificial Intelligence in Higher Education

AI has emerged as a game-changer in higher education, influencing not only pedagogical approaches and institutional management, but also the ways students learn and engage with educational content. In higher education, AI has proven to be a transformative force by revolutionizing educational practices, institutional decision-making, and student learning experiences through the adoption of intelligent educational tools and adaptive learning systems. AI-supported infrastructures are increasingly used in universities to support personalised learning, automate learning processes, improve learning efficiency, and

increase the competitiveness of the institution (Pedro et al., 2019; Zawacki-Richter et al., 2019). AI technologies also enable predictive educational interventions, intelligent tutoring systems, and data-driven academic decision-making processes that enhance learner engagement and the responsiveness of the educational system (Alam, 2021; Garzón et al., 2025). In the context of higher education in China, the penetration of AI has surged significantly, such as smart educational ecosystems, AI-based teaching methods, and intelligent learning platforms, which aim to transform and modernize university teaching and enhance technological innovation (Sun et al., 2026; Zhang et al., 2025). Empirical research shows that students, generally, view AI technologies as having positive impacts on educational accessibility, academic efficiency, and adaptive learning support, while ethical issues are not negligible, such as reliance and institutional control (Ma et al., 2024; Yan et al., 2025).

1.1.2. Learning Analytics and Student Engagement

The potential of learning analytics to analyze student data and provide predictive insights into student engagement, behaviour, and persistence in learning has made it a crucial area of AI-driven education. Previous research has conceptualized learning analytics as a data-informed learning process in HE that enables tracking of students' learning activities, detection of learning at-risk students, and support of early intervention in the learning process. The literature defines learning analytics as a learning-oriented, data-driven approach that monitors academic participation, detects learning at-risk students, and enables early interventions in the learning process within HE institutions (Viberg et al., 2018; Tsai et al., 2018). Ifenthaler and Yau (2020) suggested that the use of learning analytics systems alone is insufficient for students' success unless they are combined with personalised academic support and institutional interventions. Likewise, Márquez et al. (2024) found that universities are increasingly turning to learning analytics to enhance their retention-focused educational approaches and enhance learner engagement. Recent research also indicates that AI-powered personalised feedback systems have a positive impact on academic motivation, adaptive learning strategies, and educational involvement in smart teaching environments and intelligent tutoring systems (ITSs) (Min et al., 2025; Chen et al., 2026; Raji et al., 2026). Bond et al. (2020) also highlighted the importance of educational technologies in influencing the behavior of learners and the nature of learning interactions in digitally mediated HE settings.

1.1.3. International Students and Educational Adaptation in Chinese Universities

A growing number of scholars have been focusing on the academic adjustment and educational endurance of international students in the context of university environments that are technologically mediated. The internationalisation of Chinese higher education has gained momentum, which has drawn increased scholarly interest in the academic adaptation and educational endurance of international students in technologically mediated university environments. Previous studies have consistently found that international students often face language barriers, adjustment issues, educational stress, and emotional isolation, which can impede their educational engagement and retention (Shea et al., 2022). In Chinese universities, these problems are sometimes complicated by unfamiliar pedagogical traditions which are unfamiliar, digital learning cultures, and communication practices. The potential of AI-backed educational technologies to support international students in adaptive learning, language acquisition, and providing personalised academic guidance suggests that such tools could offer valuable assistance. Recent research indicates that AI-driven educational technologies could help international students by enabling adaptive learning, language acquisition, and tailored academic support. According to Arif et al. (2025), the foreign students' Chinese language learning and learning adaptability in Chinese universities were positively affected by the application of artificial intelligence in the process of education. Similarly, Liu and Qiao (2025) found that AI-based teaching models enhanced learning engagement and understanding by providing personalised teaching assistance. Yet, Xie et al. (2025) stated that students are still grappling with the conflicts between the accessibility of technology, institutional control, and AI governance in higher education environments. Moreover, in the era of digital-powered education, AI-based educational decision-making systems are becoming significant factors in shaping students' experience and understanding of the authority of institutions (Chen et al., 2024).

1.1.4. Ethical Concerns and Human-Centred Perspectives in AI-Supported Education

While AI-powered learning analytics has the capacity to revolutionize education, the debate around the use of AI in learning increasingly emphasizes ethical, psychological, and sociocultural issues in the scope of AI-mediated education systems. Holmes et al. (2022) highlighted the important data privacy, algorithmic bias, emotional surveillance, informed consent, and data ownership issues raised by the use of AI in education. Likewise, Alfredo et al. (2024) stated that while much of the current AI and learning analytics literature focuses on optimizing the technology, the emotional impact, agency, and real-world experiences of students in digitally mediated learning spaces are overlooked. However, Alam (2021) has highlighted the potential for the growth of AI in education to deepen technological reliance, the culture of surveillance, and institutional inequities, even though it offers educational benefits. These are especially significant issues in multilingual and intercultural settings, as different students might have different levels of access to technology and different interpretations of how institutional practices are monitored. Mukhdoom and Rajkumar (2025) thus emphasized the need for the advancement of responsible and inclusive AI systems that can become effective in handling language and sociocultural diversity in educational settings.

1.1.5. Research Gap

While the concept of AI, learning analytics, and educational technology has been studied in many different ways in the context of higher education, there are still areas of the literature that need to be developed in more depth conceptually and empirically. Previous research has tended to focus more on predictive modeling, algorithmic efficiency, technological implementation, and quantitative measurement frameworks rather than on the lived reality and interpretative understanding of students in an AI-mediated education environment (Zawacki-Richter et al., 2019; Alfredo et al., 2024). Further, previous studies have tended to focus primarily on domestic students, with international students under-represented in AI and learning analytics scholarship, especially in the context of Chinese higher education. Although there has been a focus on AI-supported educational systems, a few qualitative studies have examined the international students' perspective on the monitoring system, personalised feedback system, institutional monitoring, and digitally mediated academic support system. Hence, the present study aims to fill this gap in research and offer a comprehensive human perspective for qualitative examination of AI-LA and student retention in Chinese universities in the context of international students, while maintaining a multi-disciplinary and contextual dimension to the current educational technology literature.

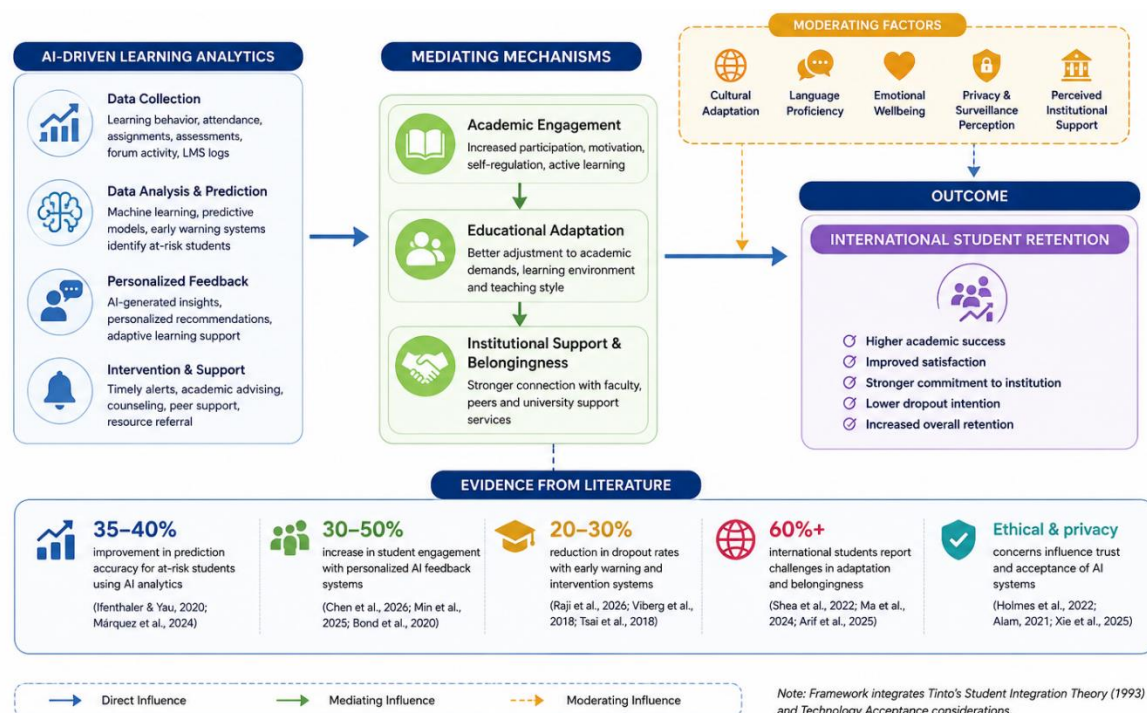


Figure 1. Conceptual Framework

1.1.6. Conceptual Framework

The present study draws from the conceptualization of Vincent Tinto's Student Integration Theory (Tinto, 1993), which focuses on the institutional features, namely a supportive learning environment, academic integration, and institutional engagement, which have been found to have a significant impact on students' academic persistence. In the realm of AI in higher education, AI learning analytics could potentially improve student retention by providing personalized feedback, monitoring student progress, offering learning assistance, and implementing early intervention strategies. Previous research shows that AI-powered learning environments have a positive impact on student engagement, educational adaptability, and academic involvement due to intelligent support infrastructures (Ifenthaler & Yau, 2020; Min et al., 2025; Chen et al., 2026). International students can also experience difficulties with cultural adaptation, emotional state, and control over surveillance, monitoring, and assessment in a technologically dominated learning context (Holmes et al., 2022; Ma et al., 2024). The study thus defines AI learning analytics as a multi-faceted mechanism impacting international student retention in Chinese universities via academic engagement, institutional assistance, and educational adaptation.

2. METHODOLOGY

The methods used in the current study were qualitative and exploratory, drawing on the insights of AI learning analytics on student internationalization and retention in Chinese universities. Qualitative methodology was deemed most suitable as the study aimed to gain an in-depth understanding of participants' lived experience, perception, interpretative experience, and academic realities in AI-integrated educational settings. The qualitative approaches, which focus more on the context, the description of lived experiences and their meanings, as well as on the relationships between the individual and the environment, allow for richer and more contextually grounded knowledge and understanding of how international students experience their academic engagement, institutional support, technological monitoring, and educational adaptation in a digitally governed higher education system. This exploratory research also allowed the scientists to critically analyze the complexity of the emotional, sociocultural, technological, and institutional aspects of educational practices that are not sufficiently explored in the literature because they are supported by AI.

Vincent Tinto's Student Integration Theory (Tinto, 1993) provided the theoretical framework for the study as it suggests that there are three dimensions of students' integration within the higher education context that have a significant influence on student persistence and retention: academic integration, institutional engagement, and social belongingness. The relevance of the theory was deemed especially salient due to the fact that AI-powered learning analytics systems are being increasingly implemented in the university context to enhance academic monitoring, personalised educational support, student engagement, and institutional responsiveness. Previous research indicates that AI-driven educational systems can have a positive impact on academic involvement, adaptive learning behaviors, and educational retention by delivering personalized feedback and predictive intervention strategies (Ifenthaler & Yau, 2020; Min et al., 2025; Chen et al., 2026). Since international students can also face the challenges of cultural adaptation, emotional health, technological surveillance, and institutional trust in AI-supported learning environments (Holmes et al., 2022; Ma et al., 2024), there is a need to provide them with cultural and psychological care. Therefore, cultural and psychological care is needed for international students facing the challenges of cultural adaptation, emotional wellbeing, technological surveillance, and institutional trust within AI-mediated learning environments (Holmes et al., 2022; Ma et al., 2024). Given this context, the theoretical framework served as a lens through which to explore the impacts of AI when applied to learning analytics on students' engagement in learning, adaptation processes, and persistence in Chinese HEIs.

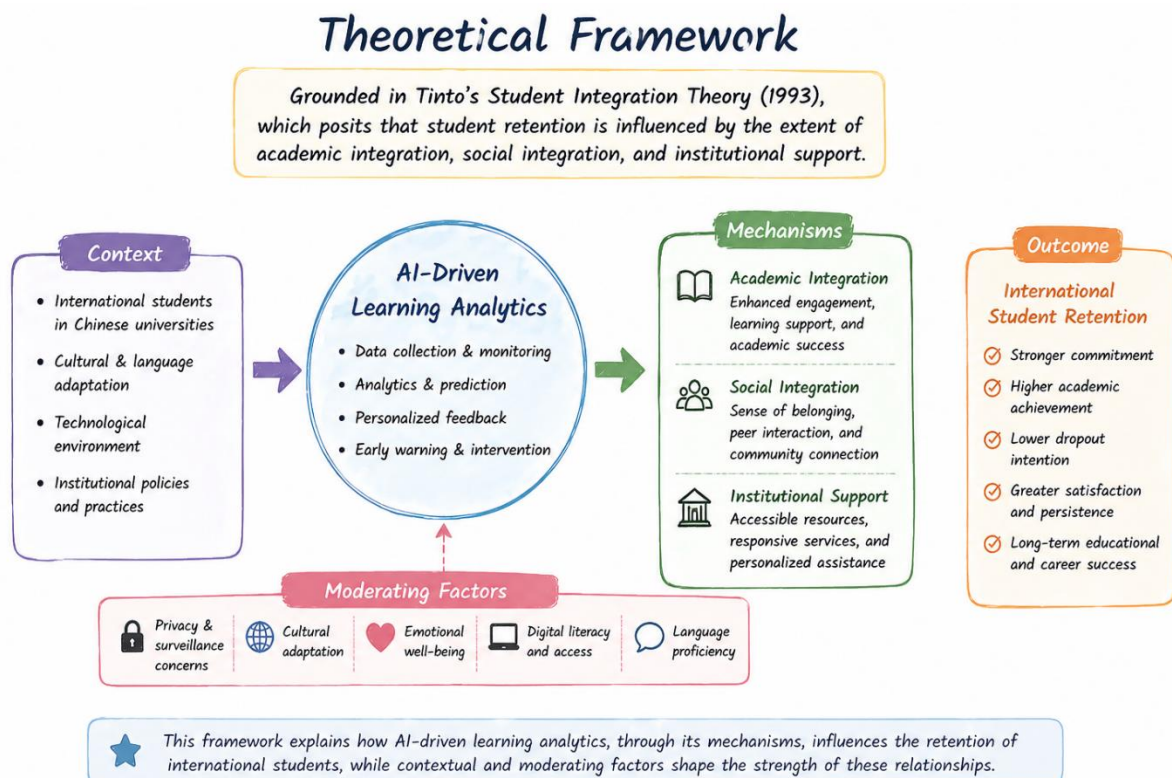


Figure 2. Theoretical Framework

The subjects in this study were 25 international students attending the undergraduate, master's, and doctorate levels at various Chinese universities. The participants were selected through purposive sampling, as this method allowed the researchers to recruit individuals who have first-hand experience in the use of AI-supported educational technologies and digitally mediated learning systems in the context of higher education in China. A diverse set of students across different academic disciplines, cultures, and countries of origin were chosen in order to gain a more comprehensive understanding of the general attitudes toward AI learning analytics and student retention. Participants had to have been enrolled as an international student at a Chinese university at the time of the study and that they had had prior exposure to AI-powered educational platforms like learning management systems, predictive academic monitoring systems, adaptive learning technologies, or personalised feedback mechanisms.

For this study, the main tool used for collecting the data was the use of semi-structured interviews, which allowed participants to share their experiences, interpretations, and perceptions in detail and in a consistent manner across interviews. The interview protocol comprised 12 guiding questions, which were based on existing studies on the use of artificial intelligence in education, learning analytics, student engagement, and international student adaptation (Holmes et al., 2022; Márquez et al., 2024; Yan et al., 2025). The interview questions were related to various interwoven themes, such as experiences with AI-supported learning analytics, perceptions of academic monitoring systems, personalised feedback, institutional support services, learning engagement, educational adaptation, emotional wellbeing, and concerns about digital surveillance and privacy in university learning environments. Some of the questions asked at the interviews were:

1. How do you see the use of AI-driven learning analytics in your university?
2. How has AI in education affected your involvement and motivation in learning?
3. In what ways has personalised feedback influenced your learning experiences so far, and what concerns do you have about privacy in AI-supported learning environments and digital surveillance?

The interviewing methods adopted were open-ended to obtain rich and reflective answers from the participants concerning their educational experiences.

Data collection was done by conducting semi-structured interviews with the selected participants through online communication platforms and face-to-face interviews as per the availability and accessibility

of the participants. Participants were briefed on the purpose and goals of the study before the interviews, and they were asked to provide informed consent in order to ensure their voluntary participation and adherence to ethical standards. The interviews took about 30 to 45 minutes, and the language of the interview was English to ensure effective communication with the international students. Interviews were recorded on tape, with the consent of the participants, for accurate transcription and analysis. All identifiable participant information was anonymized and removed from interview transcripts and research notes, and ethical issues such as confidentiality, anonymity, and voluntary participation were adhered to throughout the research process.

Analysis of collected data was carried out using descriptive thematic analysis that followed the six-stage analysis as developed by Braun and Clarke (2006). Thematic analysis was deemed suitable as it allowed for the identification, organisation and interpretation of the themes of narrated experiences and patterns that occurred repeatedly among the participants. The analysis process commenced with multiple readings of the interview transcriptions to gain familiarity with the data, then initial codes were generated to identify any key statements, ideas or concepts linked to AI in learning analytics and educational retention. Then codes were clustered into themes related to academic engagement, institutional supports, educational adaptations, personalised learning experiences, emotional wellbeing and technological issues. The identified themes were regularly examined, further elaborated and re-explicated for analytical coherence and conceptual relevance. The coding and theme development primarily done by the researcher. The coding framework and the themes that emerged were continually reviewed and discussed in peer debriefing sessions with the other co-author for the sake of increasing the credibility and trustworthiness of the findings. Any interpretation ambiguities and discrepancies were clarified and agreed upon, which provided analytical consistency and reduced interpretive bias. This process helped to develop the trustworthiness and reliability of the qualitative results. This analytic method produced a rich, interpretive, and contextually embedded understanding of the experiences of international students in AI-enabled education in higher education institutions in China.

The study used a number of qualitative validation strategies to make the findings trustworthy and credible, such as credibility, dependability, transferability, and confirmability. To improve credibility, extended engagement with the interview data and interpretation of the participants' responses was practiced. The procedures of research and analysis during the study were documented systematically to ensure dependability. To minimise interpretive bias, recorded interviews, verbatim transcription, and transparent coding procedures were maintained, which strengthened confirmability. Transferability was facilitated by detailed descriptions of participants, educational settings, and data collection in the context to enable future researchers to investigate the applicability of the findings in similar higher education settings.

3. DATA ANALYSIS AND FINDINGS

3.1. Introduction

The results of the semi-structured interviews with 25 international students studying in Chinese universities are analyzed and interpreted in this chapter. The analysis sought to draw out participants' experiences, perceptions, and interpretations of AI in learning analytics and its impact on academic engagement, adaptation to education, and student retention in technologically mediated higher education settings. The study used descriptive thematic analysis as a systematic approach to analyse the data collected, which helped identify patterns, similarities in experience, and conceptual themes that arose from participants' storylines. The results suggest that AI-based learning analytics had a substantial impact on students' learning journeys, with elements such as better academic monitoring, personalised feedback, adaptive learning support, and responsiveness of the institutions. However, participants also expressed concerns regarding privacy, emotional pressure, digital surveillance, and technological dependency within AI-mediated educational systems. The results match with previous research indicating that the use of AI-based educational technologies is both a means of educational facilitation and of governance in HE settings (Alfredo et al., 2024; Garzón et al., 2025; Holmes et al., 2022). From the thematic analysis, six main themes emerged: Academic engagement, personalised learning support, educational persistence, intercultural adaptation, ethical issues, and acceptance of AI for international students in Chinese universities. The themes are each brought up, discussed, and explained in the following sections using the voices of

participants and by comparing and contrasting with recent scholarly work in the areas of artificial intelligence, learning analytics, and student retention.

3.2. Participant Demographic Profile

The twenty-five international students in undergraduate, master's, and doctoral programmes of various Chinese universities were selected as the subjects for the study. The ages of the participants varied between 21 and 38 years and covered a variety of academic disciplines such as Education, Engineering, Business Administration, Computer Science, Social Sciences, and Humanities. Diverse geographical backgrounds were also reflected in the sample, with Asian, African, and Middle Eastern backgrounds. The majority of the participants had been studying in China for a year or more, and had previously been exposed to the use of AI-powered learning tools like learning management systems, personalised feedback platforms, and academic monitoring systems. The diversity of participants allowed for comprehensive insights into international students' experiences with AI-driven learning analytics and student retention in Chinese higher education institutions, and enriched the richness of the data.

Table 1. Demographic Profile of Participants

Variable	Category	Frequency (N=25)	Percentage (%)
Gender	Male	14	56%
	Female	11	44%
Age	21–25 Years	8	32%
	26–30 Years	10	40%
	31–38 Years	7	28%
Degree Level	Undergraduate	8	32%
	Master's	11	44%
	PhD	6	24%
Academic Discipline	Education	5	20%
	Engineering	6	24%
	Business Administration	4	16%
	Computer Science	4	16%
	Social Sciences	3	12%
	Humanities	3	12%
Region	Asia	12	48%
	Africa	9	36%
	Middle East	4	16%
Duration of Study in China	1–2 Years	10	40%
	3–4 Years	9	36%
	More than 4 Years	6	24%
Exposure to AI-Based Educational Systems	Yes	25	100%

The demographic profile illustrates that the participants possessed substantial academic and technological exposure within Chinese higher education institutions, thereby strengthening the relevance of their reflections concerning AI-driven learning analytics, educational engagement, and student retention.

3.3. Thematic Analysis

The findings from the thematic analysis of the interview data identified several interrelated themes, which represent the international students' experiences of using AI-based learning analytics tools in Chinese universities. The results suggest that AI-based education systems had a major impact on academic engagement, adaptation to learning, institutional support, and persistence in education for the participants. At the same time, students voiced concerns about privacy, emotional pressure, cultural adjustment, and technological surveillance in the context of AI-assisted learning. Overall, the identified themes illustrate that AI-based learning analytics is not simply a technology, but also a sociocultural and institutional phenomenon that contributes to students' education, psychological well-being, and decisions about whether to stay in school or drop out. In line with prior scholarship, the results indicate that AI-supported

learning technologies not only benefit adaptive learning but also present ethical challenges in digital governance and institutional monitoring (Alfredo et al., 2024; Garzón et al., 2025; Holmes et al., 2022).

3.3.1. Theme 1: AI-Driven Academic Monitoring Enhances Educational Engagement

The results showed that students' academic engagement, academic responsibility, and awareness of learning were greatly enhanced when using AI academic monitoring systems. The majority of the participants stated that the AI-powered platforms helped them to track attendance more effectively, check the completion of assignments, and assess academic performance. At a higher order, participants often referred to these systems as positive systems that exerted discipline in the education process and promoted sustained involvement in learning. One participant stated:

"Reminders on attendance, assignments, and academic performance happen regularly, and this keeps me focused academically."

The results indicated that the use of AI-based learning analytics had a positive impact on SRL behaviours and academic accountability of international students. Ifenthaler and Yau (2020) and Chen et al. (2026) also found that AI-powered learning analytics systems have a positive impact on learner engagement and adaptive educational participation by providing predictive monitoring and personalised intervention mechanisms. Some of the participants voiced, however, concerns about emotional pressures stemming from continual digital surveillance, reinforcing ethical issues raised by Holmes et al. (2022) on the surveillance of technology in AI-supported educational contexts.

3.3.2. Theme 2: Personalised Feedback Systems Improve Learning Adaptation

The research also found that artificial intelligence-based personalized feedback systems played a significant role in the learning adaptation, academic self-confidence, and learning satisfaction of students in Chinese universities. The educational platforms that used AI tools were effective at giving participants personalised feedback on their performance, recommendations for learning tasks, and suggestions for how to structure their learning, which helped them adapt to new schools better. Personalised feedback was often reported to help participants become more aware of their learning weaknesses and be able to develop learning strategies more effectively. One participant stated:

"The personalised feedback system allows me to see my strengths and weaknesses in the academic area and what I need to work on right away."

Another participant explained:

"Sometimes learning is easier with AI recommendations for international students because it is hard to understand the teaching style."

In the same vein, someone commented:

"It is recommended that the system suggest learning materials based on my progress, which makes it easier for me to adapt to college learning."

Another student noted:

"Because I can constantly monitor my progress, I feel assured of my improvement with AI feedback rather than relying on final grades."

In addition, one of the participants said:

"Personalised learning support helped me to decrease academic stress as I knew what to focus more on."

The results suggest that AI-based personal learning systems had a significant impact on the students' academic adaptation and self-confidence in a technologically mediated learning environment. The results align with earlier research indicating that AI-based personalised feedback mechanisms have a profound impact on learner engagement, adaptive learning, and educational responsiveness (Min et al., 2025; Liu & Qiao, 2025). Likewise, Fan et al. (2025) suggested that generative AI technologies have a positive impact on educational performance and learning participation as they facilitate more interactive and adaptive

learning experiences. Moreover, Raji et al. (2026) highlighted the role of intelligent tutoring systems and predictive educational analytics in enhancing students' academic persistence through facilitating targeted educational interventions and personalised support mechanisms. While some positive experiences were recorded, a few participants shared that sometimes the feedback provided by AI tools meant less direct interaction with instructors and their peers. Some students believed the balance between using technology to support learning and using academic communication should be maintained in the educational environment. However, in general, the results indicate that the use of these AI-driven feedback systems has significantly improved educational adaptation and satisfaction of international students in Chinese universities.

3.3.3. Theme 3: AI Technologies Support International Students' Academic Persistence

The results showed that AI-based educational technologies were important for academic persistence and retention for international students in Chinese universities. Participants said academic systems supported them with AI that was timely, offered learning guidance, and ensured institutional support that helped to minimize academic disengagement and increase their motivation to continue their studies. Many students reported that predictive educational systems and digital academic platforms kept them academically engaged even when dealing with adjustment issues and academic stress.

One participant stated:

"I found the university's AI learning system very useful for keeping me organised during challenging semesters and avoiding backlog."

Another participant explained:

"When I was less active, it sent me reminders and helped me to keep studying."

The results showed that such educational support systems with AI technologies had a positive impact on students' educational continuity and academic resilience. Márquez et al. (2024) also found that learning analytics systems contribute to student retention by facilitating early academic interventions and monitoring of students' engagement. Similarly, Arif et al. (2025) determined that AI tools in education positively affected the adaptability and educational participation of international students at Chinese universities. Moreover, Ma et al. (2024) noted that positive attitudes towards AI technologies strongly impact learners' motivation and learning continuity in higher education contexts. While most of the participants saw AI systems as tools for assistance, some students highlighted the importance of emotional and institutional support from faculty members and administrators to complement technological assistance. Despite this, the results indicate that the role of AI learning analytics in enhancing academic persistence of international students in Chinese higher education institutes was significant.

3.3.4. Theme 4: Cultural and Linguistic Challenges Remain to Affect Retention

The thematic analysis showed that cultural adaptation challenges and language issues continue to be key obstacles to international students' learning and staying at Chinese universities. Even with the adoption of AI-powered educational systems, many participants described experiencing feelings of isolation, stress, and a lack of academic security due to divergent communication styles, teaching practices, and sociocultural expectations.

One participant remarked:

"Language barriers are still problematic for international students when interacting in class with AI learning support."

Another participant stated:

"The educational system is technologically advanced, but adapting socially and culturally was still challenging for me."

Based on these results, it can be concluded that using AI technology in learning analytics can support educational adaptation, but it is still not a perfect solution for overcoming intercultural and emotional problems faced by international students as a result of the use of this technology. The findings were similar

to those of Shea et al. (2022), who highlighted that belongingness and social integration within the institution have strong implications for educational engagement and persistence. Similarly, Arif et al. (2025) maintained that AI tools for language learning positively facilitate the process of adaptation of international students in Chinese universities. In the context of cross-cultural higher education, Ma et al. (2024) also emphasized how social, cultural, and behavioral factors affect students' learning experiences with AI technologies.

The results thus suggest that, besides the use of AI-assisted educational technologies, the effective use of these technologies in academic accessibility and learning support also demands human-centred institutional support, intercultural inclusion, and a communication environment in Chinese universities for successful student retention.

3.3.5. Theme 5: Ethical Concerns Regarding AI-Driven Learning Analytics

The findings also showed that there was a lack of uniformity in the participants' views on the ethics of using AI-driven learning analytics in Chinese universities. While students recognized the advantages of using AI to facilitate academic oversight and tailor feedback to each student's needs, several of the participants raised concerns about privacy, digital surveillance, emotional stress, and institutional control. Some students reported experiencing some anxiety and psychological discomfort at times due to the continuous monitoring of attendance, academic behaviour, and online participation. One participant stated:

"Sometimes the university seems to be monitoring all academic activities, which puts pressure and stress."

Another participant explained:

"Students' privacy and freedom from constant digital observation needs to be respected, as do the learning possibilities of AI systems."

The results of this research indicate that AI-driven educational systems can serve as both educational support and institutional surveillance. Holmes et al. (2022) similarly pointed out the ethical issues associated with putting AI into practice in education, such as concerns about privacy, informed consent, data ownership, and emotional surveillance. Similarly, the authors of Alfredo et al. (2024) highlighted the need to prioritise human-centred strategies in AI-powered educational systems to ensure that students' emotional needs and autonomy are not overlooked. Alam (2021) also highlighted the potential of AI technology to exacerbate technological dependence and surveillance culture in the education sector, despite the benefits it provides for learning. Participants also raised issues about transparency and awareness of data collection and use in institutions. The results align with Xie et al. (2025), who found that students often experience conflicts between the ease of access to technology and institutional control in AI-driven learning contexts. In sum, the results indicate that ethics issues continue to be an important aspect of the international students' experience with AI learning analytics in Chinese HEIs.

3.3.6. Theme 6: AI Acceptance and Digital Learning Behaviour

The thematic analysis also showed that most of the participants were positive about the use of AI-aided educational technologies and believed in their role in improving academic performance, learning efficiency, and educational organisation. Participants often highlighted the benefits of AI systems, noting their usefulness in streamlining academic tasks, fostering adaptive learning, and improving access to education in digitally mediated learning environments.

One participant stated:

"AI technologies make it easier to study as they offer instant support, learning materials and personalised advice."

Another participant explained:

"As time went on, I started to feel more at ease with the digital learning systems, as AI tools enabled me to perform better academically."

The results suggest that the students' acceptance of AI technologies is significantly linked with perceived usefulness, educational convenience, and adaptive learning support. Yan et al. (2025) also reported that students had a positive attitude towards AI technologies, as they believe that they enhance the efficiency of learning and education. Similarly, Liu et al. (2025) noted that students' receptivity to AI technologies holds paramount importance in educational settings, impacting academic attainment and critical thinking. Fan et al. (2025) also highlighted the positive impact of AI-powered education systems on learning outcomes and students' engagement, contributing to more interactive learning experiences. Not all participants, however, commented on the possible decrease in independent learning behaviours and face-to-face academic interaction resulting from over-reliance on AI technologies. Overall, the results indicate that the impression that an AI-based education system is supportive and accessible, and that it is beneficial to the student's academic experience in the university, is more or less common among the international students.

3.4. Cross-Theme Interpretation

The cross-theme interpretation showed that the impact of AI-based learning analytics on the learning process of international students in Chinese universities was multidimensional. In all themes, participants showed a consistent view of AI-supported educational systems as a valuable tool to enhance academic engagement, personalised learning adaptation, educational organisation, and institutional support. Academic monitoring systems, predictive interventions, and individualised feedback systems, all powered by AI, helped reinforce learning motivation and awareness among students in tech-enabled higher education settings. Together, these AI-driven academic monitoring systems, predictive intervention systems, and personalised feedback platforms played a significant role in enhancing students' educational persistence and learning awareness in technologically mediated higher education. At the same time, the results revealed that AI-powered learning analytics also raised emotional, ethical, and sociocultural issues for all participants. While students recognized the educational and learning advantages of AI-driven platforms, there was a general concern about privacy, digital surveillance, institutional oversight, and dependence on technology. The results suggest that AI-mediated learning environments are both educational facilitation systems and institutions of educational governance, which further strengthens current academic debate on the duality of AI in higher education (Alfredo et al., 2024; Holmes et al., 2022). The study also identified that technology support was not enough to guarantee the success of international student retention. Intercultural inclusion, emotional wellbeing, institutional belongingness, and human-centred learning interaction continued to be highly significant recurrent themes in Chinese universities. In spite of the high level of AI-enabled educational support systems, cultural adaptation that is not working well and language barriers, social isolation still posed a big problem. The results are consistent with the Vincent Tinto Student Integration Theory, which holds that academic integration, institutional engagement, and social belongingness within the higher educational context are important factors influencing educational persistence. Overall, the cross-theme interpretation shows that when AI-based learning analytics is combined with ethical governance, institutional care, and a human-centred support system, it has a positive impact on educational engagement and student retention. The results thus indicate the need for creating educational ecosystems where technology is complemented by emotional, sociocultural, and interpersonal aspects of students' support in international higher education settings.

4. DISCUSSION

The results of the current study show that AI-based learning analytics had a significant impact on the academic engagement, educational adaptation, and retention of international students in Chinese universities. AI-enabled learning systems, such as academic monitoring platforms, tailored feedback, and predictive learning analytics, were consistently found to increase learning awareness, academic organisation, and participation in learning. These findings align with other studies that have indicated that AI-based education systems can foster increased engagement, adaptive learning strategies, and greater educational responsiveness through personalised interventions and intelligent academic support (Bond et al., 2020; Ifenthaler & Yau, 2020; Bond et al., 2020; Min et al., 2025; Chen et al., 2026). Likewise, the study's results are consistent with Liu et al. (2025) and Fan et al. (2025), who reported that AI technologies positively impact academics, higher education learning participation, and the development of critical thinking in the

higher education context. The results further indicated that AI-powered educational systems boosted academic persistence by offering students adaptive learning advice, immediate academic interventions, and institutional support systems that minimized educational disconnection and helped students adjust to learning in different countries.

Even though these positive learning outcomes are significant, the study also shed light on the great cultural, emotional, and ethical challenges encountered in AI-mediated learning environments. The participants often shared their experiences with language barriers, social isolation, emotional stress, and intercultural adjustment issues in Chinese universities. Furthermore, some students voiced concerns about privacy, institutional surveillance, emotional pressure, and over-technical monitoring experienced with AI tools that track learning. The results of this study align with Holmes et al. (2022), who stated that the use of AI in educational environments raises substantial ethical issues related to data privacy, emotional welfare, and institutional dynamics. Alfredo et al. (2024) also stated that implementing AI in education raises many issues, including privacy concerns, emotional well-being, and institutional power dynamics. Similarly, Alam (2021) and Xie et al. (2025) argued that while AI technologies can broaden the accessibility of education and improve institutional efficiency in educational settings, they can also deepen surveillance culture and technological dependence in higher education. Thus, the results suggest that technological innovation is not enough in terms of effective retention of students if good emotional support, intercultural inclusion, and human-centered educational interaction are not included.

The results are also analyzed using Vincent Tinto's Student Integration Theory (Tinto, 1993), a theory that focuses on the importance of how students become integrated into the academic environment, their engagement in the institution, and their sense of belonging to the institution. The current study shows how the use of AI in learning analytics positively supports academic integration and institutional responsiveness by providing personalised support and predictive educational intervention. But the results also show that interpersonal communication, institutional care, and culturally diverse school settings are still relevant key factors in the education of international students in China. One of the main strengths of the study is that it delves into AI-supported educational experiences from a human-centred perspective, taking a qualitative approach instead of the more common quantitative and technologically deterministic line of scholarship that has dominated research on AI in education so far (Zawacki-Richter et al., 2019; Garzón et al., 2025). Overall, the study points out that AI-based learning analytics have the potential to significantly enhance international student engagement and retention when used ethically and adopted in concert with supportive, inclusive, and student-centred institutional practices.

5. CONCLUSION

This research examined the impact of AI-based learning analytics on student retention among international students in Chinese universities. The results indicated that the use of AI in educational systems had a significant effect on improving academic engagement, adaptation to personalised learning, educational organisation, and educational responsiveness in a technologically mediated higher education setting. Overall, international students were mostly positive towards the use of AI in learning analytics to enhance learning awareness, engagement, and persistence, highlighting its potential in providing tailored feedback, anticipating needs, and supporting intelligent learning environments. The insights gained from these findings suggest that AI tools have significant promise in enhancing student retention and continuity in today's higher education landscape. The study found that technological advancements are not enough to solve the sociocultural, emotional, and ethical issues that are faced by international students. Language barriers, intercultural adjustment challenges, emotional stress, privacy issues, digital surveillance, and institutional monitoring remained prevalent issues for participants in AI-supported learning settings. Thus, the results reveal that retention is possible through a balance between technologization and human-centred teaching and learning, emotional support, and culturally diverse institutional contexts. This research further emphasizes the need for implementing student-centered and ethically sound AI systems that can enhance academic achievement and foster psychological health and belongingness among students. This study has practical implications for the key stakeholders in higher education. To teachers, the use of AI learning analytics in combination with pedagogical support for the human student may allow them to detect at an early stage those students who are at risk of academic failure and allow for intervention before it is too late. University leaders and decision-makers should create culturally responsive and ethically sound AI tools that

uphold student confidentiality and foster student engagement and retention. Curriculum developers are invited to create learning spaces that will provide personalised AI feedback alongside opportunities for interpersonal, intercultural, and emotional interaction. The results suggest the importance of continued longitudinal and mixed-method studies on how AI-supported learning spaces impact student wellbeing, achievement, and retention over time for researchers. The present study adds to the current educational technology literature from a human-centred qualitative angle on the use of AI for learning analytics in the context of international student retention in Chinese universities. The current study, which contrasts with most previous studies that have focused on quantitative modelling and technological efficiency, emphasizes the lived experiences, perceptions, and interpretive realities of international students who engage with AI-based educational systems. The study thus builds upon the existing literature by creating an interdisciplinary link between artificial intelligence, learning analytics, international education and student persistence in non-Western higher education contexts. Although it has made contributions, the study has a number of limitations. The sample size of the study was comparatively small, with 25 international students, and the results may not be generalisable to a wider education context. Also, the study concentrated on China's universities, so the findings might not be fully applicable to the experiences of international students in other countries' educational systems. In future studies, a mixed-methods and/or longitudinal study design with larger and more diverse sample sizes of students can be used to gain greater empirical understanding of AI learning analytics and student retention in a wider range of educational settings. In conclusion, the study suggests that the use of AI learning analytics in higher education environments that prioritize humanizing, inclusion, and acting ethically can be a valuable tool for engaging with students from abroad and supporting their adaptation to the educational context and maintaining their academic journeys. In light of these considerations, universities should focus on building a balanced ecosystem of education in the age of AI, combining technological efficiency with a commitment to institutional care, interculturality, and the enrichment of human relationships, to boost international student retention and lasting educational outcomes.

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Data Availability Statement: The data underlying the conclusions of this study are included within the manuscript. The information in the data is not public information since it may contain information that would possibly compromise the privacy and confidentiality of the participants.

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