

A Study on Academic Adaptation Enhancement Strategies for ASEAN International Students Based on Learning Analytics Technology

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Abstract: Academic adaptation of international students has become a focus in higher education institutions. This paper conducts an empirical study based on learning analytics technology with ASEAN international students in two universities in Guangxi as the research subjects. Firstly, the paper analyzes the concept, principles, and application of learning analytics technology in personalized learning. Secondly, through empirical research, the effectiveness and feasibility of learning analytics technology in enhancing academic adaptation ability are discussed. Furthermore, the implementation effect of academic adaptation enhancement strategies, the role and limitations of learning analytics technology, as well as future recommendations are discussed. In conclusion, it is summarized that learning analytics technology provides important support for improving the academic adaptation ability of international students, and suggestions for further improving strategies are proposed.

1. Introduction

In the current globalized educational environment, studying abroad has become one of the crucial pathways for many students to pursue academic and career development [1]. Particularly, the number of international students from the ASEAN region is increasing continuously, highlighting their challenges and needs in higher education in the host countries. However, many

ASEAN international students face various difficulties in adapting to new academic environments and learning methods, directly affecting their academic performance and personal development [2-3]. Therefore, effectively enhancing the academic adaptation ability of ASEAN international students has become one of the urgent issues to address in the current higher education sector.

This paper aims to explore how to effectively enhance the academic adaptation ability of ASEAN international students through learning analytics technology. Learning analytics technology is an emerging technology that integrates knowledge from various fields such as education, psychology, and computer science. It collects, analyzes, and interprets data from students' learning processes to understand and meet their personalized learning needs [4-5]. This paper will investigate the current application status of learning analytics technology in higher education and propose academic adaptation enhancement strategies based on this technology.

Through the research presented in this paper, it will contribute to a deeper understanding of the challenges faced by ASEAN international students in the academic adaptation process and provide theoretical and practical guidance for developing more effective strategies to enhance academic adaptation ability [5-6]. This will not only improve the learning outcomes of ASEAN international students in host countries but also advance progress in the higher education sector in utilizing technological means to enhance teaching quality.

2. Overview of Learning Analytics Technology

Learning analytics technology is a method that utilizes big data and artificial intelligence techniques to analyze students' learning behaviors and processes [7]. Its development can be traced back to the era of computer-assisted instruction in the field of education. However, with the continuous advancement of technologies such as data collection, data analysis, and machine learning, learning analytics technology has gradually become a research hotspot in the field of education [8]. By collecting and analyzing various data generated by students during the learning process, such as learning behaviors, learning outcomes, and learning content, learning analytics technology can help educators gain a deeper understanding of students' learning situations, thereby better guiding teaching practices and personalized learning.

The application of learning analytics technology in the field of higher education is increasingly widespread, primarily in aspects such as tracking students' learning behaviors, monitoring the learning process, and assessing learning outcomes [9]. Through learning analytics technology, educational institutions can monitor students' learning progress and effectiveness in real-time, promptly identify students' learning difficulties and issues, and provide targeted assistance and support. At the same time, learning analytics technology can also provide data support for educational decision-making, helping educational institutions develop more scientific teaching plans and policies.

In the context of enhancing the academic adaptation ability of international students, learning analytics technology possesses significant potential and advantages. By analyzing the data generated during international students' learning processes, educators can gain insights into their learning habits, preferences, and difficulties, providing data support for personalized learning and support [5]. Moreover, learning analytics technology can help educators promptly identify problems and challenges in international students' learning and provide effective intervention measures to promote the enhancement of their academic adaptation ability. Therefore, applying learning analytics technology to enhance the academic adaptation ability of international students is expected to yield good results and effectiveness.

3. Analysis of the Academic Adaptation Status of ASEAN International Students

ASEAN international students hold a significant position within the international student community, exhibiting unique characteristics and challenges in academic adaptation [10]. The cultural, linguistic, and educational system differences between the ASEAN region and China pose certain difficulties for international students' academic adaptation [11]. Moreover, many ASEAN international students come from diverse socioeconomic backgrounds and educational levels, leading to substantial disparities in their learning foundations and academic abilities, which further complicates their adjustment to the new academic environment. Cultural shock, language barriers, and academic pressure are common challenges faced by ASEAN international students, manifesting varying degrees of difficulty in adapting to the new academic and living environment [3].

ASEAN international students encounter numerous difficulties and issues in academic adaptation. Firstly, language barrier stands as one of the most significant obstacles. Upon arrival in China, many ASEAN international students are confronted with different language environments, including classroom teaching languages and daily communication languages, posing challenges to their learning and communication [10-11]. Secondly, differences in learning styles and teaching philosophies are also among the challenging aspects of academic adaptation for international students. Many students are accustomed to the teaching methods and learning patterns in their home countries, requiring time and effort to adapt to different teaching methods and learning requirements in the new academic environment [12]. Additionally, cultural shock and psychological pressure are crucial factors affecting international students' academic adaptation. They need to seek support and assistance in the new environment to overcome various difficulties and challenges.

Currently, strategies for enhancing the academic adaptation ability of ASEAN international students in Chinese universities have certain deficiencies. These include: 1) Insufficient and non-personalized support and services for international students. Although many educational institutions recognize the importance of international students' academic adaptation, there are limitations in their specific implementations, making it challenging to effectively meet the personalized learning needs of international students [13]. 2) Existing support measures lack systematic and sustained support. While many educational institutions provide some training and support courses for international students, these measures often lack systematic and sustained support, making it difficult to provide long-term stable support and assistance for international students. 3) Educational institutions and educators have not fully and widely applied learning analytics technology, thereby failing to fully utilize its role in enhancing academic adaptation ability [14]. Therefore, it is necessary to further improve strategies for enhancing academic adaptation ability, fully utilize advanced technologies such as learning analytics, and provide more effective support and assistance for ASEAN international students.

4. Exploration of Academic Adaptation Enhancement Strategies Based on Learning Analytics Technology

Enhancing academic adaptation ability is crucial for international students' learning and life. The introduction of learning analytics technology provides new insights and possibilities for devising more personalized and effective strategies to enhance academic adaptation ability. The following discussion will explore learning analytics technology in personalized learning, diagnosing learning difficulties, and providing effective feedback, illustrated with specific case examples.

4.1 Theoretical Basis of Learning Analytics Technology in Enhancing Academic Adaptation Ability

As an emerging technology integrating knowledge from education, psychology, and computer science, learning analytics technology possesses an important theoretical basis in enhancing academic adaptation ability [4]. Firstly, learning analytics technology enables comprehensive monitoring and tracking of international students' learning processes. By analyzing various data generated by students during learning, including learning behaviors, trajectories, and outcomes, it reveals students' learning patterns and characteristics, providing a basis for personalized learning plans [15]. Secondly, learning analytics technology facilitates real-time monitoring and analysis of students' learning behaviors and outcomes, promptly identifying learning difficulties and issues, and providing targeted interventions and support to improve students' learning effectiveness and academic adaptation ability. Finally, through techniques such as data mining and machine learning, learning analytics technology can uncover potential connections and patterns among students, providing educators with deeper understanding and insights to guide teaching practices and personalized instruction [16].

4.2. Application of Learning Analytics Technology in Personalized Learning

Personalized learning is one of the important application directions of learning analytics technology in enhancing academic adaptation ability [17]. Through learning analytics technology, educators can accurately identify and analyze the learning needs and styles of international students, providing personalized learning support and services. Specifically, educators can tailor learning plans and course arrangements for international students based on the data obtained from learning analytics technology, meeting their diverse learning needs and academic levels. Furthermore, learning analytics technology can automatically generate personalized learning suggestions and feedback based on students' learning behaviors and outcomes, guiding students to learn more effectively and improve academic abilities. Additionally, personalized learning can provide international students with personalized learning resources and environments through recommendation systems and other technological means, enhancing their learning motivation and effectiveness.

Learning analytics technology helps educators better understand the learning needs and styles of international students, achieving the goal of personalized learning. Taking an example of a student from Southeast Asia, through the application of learning analytics technology, educators can understand the language challenges faced by the student, as well as their interests and strengths in specific subjects. Based on this data, educators can tailor learning plans and teaching content for the student, providing targeted academic support and guidance. Additionally, learning analytics technology can automatically generate personalized learning suggestions and feedback based on the student's learning feedback and progress, helping the student adjust learning strategies and improve learning effectiveness.

4.3. Role of Learning Analytics Technology in Diagnosing Learning Difficulties and Providing Effective Feedback

Learning difficulties are one of the important factors affecting international students' academic adaptation ability, and learning analytics technology plays a key role in diagnosing learning difficulties and providing effective feedback. By analyzing the data generated during students' learning processes, learning analytics technology can promptly identify students' learning difficulties and issues and identify possible causes and influencing factors [1]. Educators can utilize

the data and information provided by learning analytics technology to provide tailored learning support and assistance for international students, helping them overcome learning difficulties and improve learning effectiveness. Additionally, learning analytics technology can provide educators with an effective feedback mechanism, helping them better understand students' learning situations and academic performance, adjust teaching strategies and methods timely, and improve teaching quality and learning effectiveness [16]. Therefore, learning analytics technology has important application prospects and potential in diagnosing learning difficulties and providing effective feedback, which is significant for enhancing international students' academic adaptation ability.

Learning analytics technology also helps educators promptly identify international students' learning difficulties and issues and provide effective feedback and support [5]. For example, an ASEAN international student may encounter difficulties in a certain course, but due to language barriers or cultural differences, they may not seek help from the teacher in a timely manner. Through learning analytics technology, educators can identify changes in the student's learning performance compared to usual, thereby identifying potential difficulties. Through targeted intervention and support, international students can overcome learning difficulties and improve academic adaptation ability. Additionally, learning analytics technology can provide educators with an effective feedback mechanism, helping them better understand international students' learning situations and academic performance, adjust teaching strategies and methods timely, and improve teaching quality and learning effectiveness.

In practice, the application of learning analytics technology can be combined with various data sources, such as student learning behavior data, learning performance data, online discussion data, etc., for comprehensive analysis. By analyzing this data, educators can gain in-depth insights into international students' learning conditions and academic performance, providing personalized academic support and guidance. Therefore, learning analytics technology plays an important role and significance in enhancing international students' academic adaptation ability.

5. Case Analysis and Empirical Research

5.1 Selection of Research Subjects and Testing Network Platforms

In order to deeply investigate the effectiveness of learning analytics technology in enhancing the academic adaptation ability of ASEAN international students, we selected a group of ASEAN international students from Youjiang Medical University for Nationalities and Baise University in Guangxi, China, as our research subjects. These students come from different countries, with diverse cultural backgrounds, educational experiences, and learning habits, but they all face similar academic adaptation challenges. Some of them may have been studying in China for some time but still feel academic pressure and learning difficulties, while others may have just arrived and face challenges such as language barriers and cultural shock. Through studying these international students, we aim to explore the application effectiveness of learning analytics technology in different contexts and propose corresponding strategies to enhance academic adaptation ability.

Regarding the selection of network platforms, we used data from the Chaoxing FanYa learning platform(<http://fanya.chaoxing.com/portal>). Over the course of 2 semesters, we exported relevant data from the backend continuously to assess and improve the learning outcomes of international students.

5.2. Analysis Process of International Students' Teaching Data

In the empirical research, we first collected various data generated by international students during the learning process, including but not limited to class attendance, homework completion,

participation in online learning activities, and exam scores. These data were collected and recorded through the school's academic affairs system, online learning platforms, etc., to ensure the authenticity and integrity of the data. Next, we used learning analytics technology to conduct in-depth analysis of these data, exploring international students' learning behavior patterns, characteristics, and potential learning difficulties and issues.

During the analysis process, we employed various learning analytics technologies, including but not limited to data mining, machine learning, natural language processing, etc. Through these techniques, we could discover potential patterns and rules from a large amount of learning data, providing a basis for formulating subsequent strategies to enhance academic adaptation ability. For example, we could use data mining techniques to identify learning difficulties and issues that international students are prone to encounter in specific subjects or courses, as well as possible reasons and influencing factors. Through machine learning techniques, we could establish models of international students' learning behaviors to predict their learning dynamics and academic performance.

Based on the in-depth analysis results of learning analytics technology, we formulated targeted strategies to enhance academic adaptation ability. These strategies include but are not limited to personalized learning plan formulation, targeted academic counseling and support, and recommendations for online learning resources. For example, targeted academic counseling can provide corresponding guidance and support based on students' learning difficulties and issues in specific subjects or courses to help them understand concepts and solve problems. Personalized learning plan formulation can tailor learning plans and course arrangements according to students' learning characteristics and academic needs, enabling them to learn more efficiently and improve academic abilities.

Through the empirical research, we aim to verify the effectiveness and feasibility of learning analytics technology in enhancing academic adaptation ability. We apply the strategies to actual teaching and evaluate and verify their effects to validate the practical effects of learning analytics technology in enhancing the academic adaptation ability of ASEAN international students.

5.3. Analysis of Empirical Results and Effectiveness and Feasibility of Enhancement Strategies

After a period of empirical research, we analyzed and evaluated the implementation effects of academic adaptation enhancement strategies. Firstly, we found that the strategy of providing personalized learning support and effective feedback using learning analytics technology could effectively help international students overcome learning difficulties and improve academic performance. For example, by monitoring and analyzing students' learning data, we promptly identified some international students' learning difficulties in specific subjects or courses and provided targeted academic counseling and support, resulting in a significant improvement in their academic performance.

Secondly, we found that the formulation of personalized learning plans and the application of recommendation systems also played a positive role in enhancing international students' academic adaptation ability. By tailoring learning plans and course arrangements based on the data obtained from learning analytics technology and recommending personalized learning resources and environments, we could effectively improve international students' learning motivation and effectiveness. For example, we designed a personalized online learning platform that provided customized learning content and support based on international students' learning preferences and academic needs, leading to significant progress in academic adaptation.

6. Results and Discussion

6.1 Analysis of Implementation Effects

After conducting empirical research on academic adaptation enhancement strategies based on learning analytics technology, we conducted in-depth analysis of their implementation effects. We found that these strategies have achieved significant results in enhancing the academic adaptation ability of international students. Through measures such as personalized learning plan formulation, targeted academic counseling and support, and recommendations for online learning resources, international students' learning motivation has been improved, learning difficulties have been effectively overcome, and academic performance has been significantly enhanced. For example, our empirical research found that with the support and guidance of learning analytics technology, some international students who originally had poor grades made significant progress in specific subjects or courses, with their academic performance greatly improved.

Furthermore, we found that the formulation of personalized learning plans and the application of recommendation systems have had a positive impact on international students' learning outcomes. By tailoring learning plans and course arrangements based on students' learning characteristics and academic needs, and recommending personalized learning resources and environments, we can effectively enhance international students' learning motivation and outcomes. For example, our empirical research found that personalized online learning platforms could effectively stimulate international students' learning interests and motivation, improving their participation and learning outcomes. Overall, the implementation effects of academic adaptation enhancement strategies are encouraging, providing important empirical support and theoretical guidance for enhancing the academic adaptation ability of international students.

6.2. Limitations

Although learning analytics technology plays an important role in enhancing the academic adaptation ability of international students, there are also limitations and challenges. Firstly, the application of learning analytics technology requires a large amount of learning data support, but many educational institutions currently lack perfect data collection and management, leading to issues such as data quality and data privacy protection. Secondly, the application of learning analytics technology requires professional technical support and human resource investment, but many educational institutions currently lack investment in technical facilities and personnel, limiting the widespread application of learning analytics technology. Additionally, although learning analytics technology can discover potential patterns and rules from learning data, providing a basis for personalized learning and support, it still has certain limitations. For example, learning analytics technology may overlook the influence of individual differences among international students, leading to less accurate formulation and recommendation of personalized learning plans. Therefore, when applying learning analytics technology, it is necessary to fully consider the individual differences and special needs of international students, focusing on the implementation of personalized learning and support.

6.3. Suggestions and Prospects

Based on the above discussion and analysis, we propose the following suggestions and prospects for future strategies to enhance the academic adaptation ability of international students. Firstly, educational institutions should strengthen the collection and management of learning data, improve data quality and security, and provide more reliable data support for the application of learning

analytics technology. Secondly, educational institutions should increase investment and support for learning analytics technology, improve the level of technical facilities and technical personnel, and promote the widespread application of learning analytics technology.

7. Conclusion

Learning analytics technology plays an important role in enhancing the academic adaptation ability of international students. By analyzing a large amount of data generated during the learning process of international students, we can discover their learning patterns, characteristics, as well as potential learning difficulties and issues, providing a basis for formulating personalized learning plans and offering targeted academic support. The empirical research in this paper also confirms the effectiveness and feasibility of learning analytics technology in enhancing the academic adaptation ability of international students.

The application of personalized learning plan formulation and recommendation systems is one of the important approaches to enhance the academic adaptation ability of international students. By tailoring learning plans and course arrangements according to students' learning characteristics and academic needs, as well as recommending personalized learning resources and environments, we can effectively improve international students' learning motivation and effectiveness. In the empirical research, we found that the application of personalized learning plan formulation and recommendation systems had a positive impact on the academic performance of international students.

However, despite the significant role of learning analytics technology in enhancing the academic adaptation ability of international students, there are also challenges and limitations. For example, issues such as the quality and security of learning data, as well as the investment in technical facilities and human resources, still need to be addressed. Therefore, in future research and practice, we need to strengthen the research and application of learning analytics technology, fully unleash its potential in enhancing the academic adaptation ability of international students, and provide more effective support and assistance for their learning and development.

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