

Exploring the Effects of Ai, Social Inclusion, and Well-Being on Academic Performance for Students with Disabilities in China

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Abstract

Poor academic performance has promoted a global crisis that most institutions perceive as an epidemic that requires mitigation to yield high student excellence, especially for students with disabilities. In China, students with disabilities at Shandong Normal University have experienced poor academic performance, which emanated from a lack of artificial intelligence, social inclusion, and students' well-being, leading to poor academic performance. This study investigates the impact of AI, social inclusion, and well-being on the academic performance of students with disabilities in China. This study employed a descriptive and correlational design, targeting a population of 37,000 students with disabilities at Shandong Normal University, China. The researcher received a sample of 291 questionnaires out of 380, yielding a response rate of 76.6% using a self-administered questionnaire and simple and stratified random sampling. Before data collection, an expert review was conducted to enable a pilot study with a 30 sample for reliability testing. The researcher adopted SPSS for the regression analysis to test the hypotheses. This result confirmed a significant and positive correlation between artificial intelligence, social inclusion, students' well-being, and academic performance for students with disabilities in China. In addition, the results from regression analysis showed that artificial intelligence, social inclusion, students' well-being, and academic performance have a P-value of 0.000, which is less than < 0.001 . The findings revealed that improved artificial intelligence, social inclusion, and students' well-being encountered at Shandong Normal University would aid in minimising poor academic performance. In conclusion, integrating artificial intelligence is essential in promoting students' academic performance, thereby personalising learning experiences, providing continuous support, and automating tasks, which leads to improved efficiency and engagement. This study is significant in addressing the gap identified in previous studies, while contributing to the body of knowledge and promoting the academic performance of students with disabilities in China.

Keywords: Academic Performance, AI, Social Inclusion, Students' Well-Being, Shandong Normal University

Introduction

Academic performance refers to the outcome of a student's efforts to achieve goals across various academic subjects (Firdous et al., 2023). Students with disabilities have faced numerous challenges in adjusting to their academic performance globally, which has hindered their academic excellence and poses a threat to their future career opportunities (Li et al., 2021; Karagianni & Drigas, 2023; Dollinger & Hanna, 2023; Li, 2024). However, every student expects equal opportunities and treatment irrespective of their challenges, as they tend to develop the skills and knowledge necessary for their career growth. Artificial intelligence is rapidly emerging as one of the most transformative technologies of the 21st century, revolutionising various sectors, including healthcare, transportation, and education (Rios-Campos et al., 2023). Yang et al. (2023) affirm that artificial intelligence's potential to enhance learning experiences, support lecturers, and improve academic outcomes has generated considerable excitement in the educational sphere in terms of academic performance among students with disabilities. Inclusive education has been a critical objective for educational systems globally, aiming to ensure that all students, regardless of their physical, sensory, cognitive, or emotional abilities, have equal access to educational opportunities (Olagunju et al., 2022; Liu & Xu, 2024). Inclusive education helps remove barriers preventing students with disabilities from fully participating in learning (Zheng et al., 2022; Taylor, 2023). Students' well-being is crucial in fostering social interaction for students with disabilities (Remskar et al., 2022). This process promotes their sense of belonging and participation within the university community. For students with disabilities, enhancing their well-being has been challenging due to physical, social, or communicative barriers that limit their participation on campus (Rasheed et al., 2022; Nie et al., 2024).

Poor academic performance is an issue that negatively influences students with disabilities, thereby inflicting stress, emotional instability, loss of sense of belonging, and poor decision-making and leading to their poor academic performance (Lai et al., 2024; Kjærgaard et al., 2024). Globally, issues associated with poor academic performance are linked to a poor environment, lack of resources, social mobility, and inadequate technological infrastructure, leading to unstable student performance in universities (Moesarofah et al., 2023; Adamopoulou & Kaya, 2024). In the Shandong province of China, poor student academic performance is perceived as an issue due to a lack of artificial intelligence, social inclusion, and students' well-being integration among students with disabilities at Shandong Normal University (Liu & Chen, 2021; Nie et al., 2023; Devine, 2023; Fu & Tu, 2023; Wut et al., 2024). Based on the statistics data, it asserts that there is a decline in academic performance from 2019 (29.7%) to 2023 (17.9%) and a decline in student performance records by 29.4% to 17.9%, drastically influencing students with disabilities in fostering their learning, listening and speaking disabilities to integrate and improve their academic performance (Devine, 2023; Xie & Wang, 2024; Ha et al., 2024). These challenges have occurred and encountered within the past five years and have affected the students with disabilities in terms of difficulty in interacting with peers, feeling a sense of belonging, managing stress, decision making, and inclusion with campus activities, leading to their poor happiness and academic achievement (Jiang et al., 2022; Green et al., 2023; Meng et al., 2024). However, China has a population of persons with a university degree (referring to college and above), which was 940,000, accounting for 6.5% of the population (Yung et al., 2022; Sefora & Ngubane, 2023). However, China has enacted more than 60 laws and regulations to safeguard the rights of individuals with disabilities, encompassing those with visual, auditory, linguistic, physical, intellectual,

psychological, and multiple disabilities (Li et al., 2023; Devine, 2023). In Shandong province, students with disabilities are the third most populous province that has the highest rate of students with disabilities and which has recorded difficulties in learning and improving their academic performance and achievement (Li et al., 2021; Li et al., 2023; Yu, 2023; Khalijian et al., 2023).

However, in the context of Chinese universities, the implementation of AI for students with disabilities is still limited and faces numerous challenges. One of the critical barriers to the adoption of artificial intelligence in education is the high cost associated with its implementation, which makes it difficult for universities to integrate it to enhance the learning capabilities of students with disabilities (Zhang & Li, 2020; Al-Tkhayneh et al., 2023). However, initial investment costs, maintenance, and continuous upgrading of AI systems require substantial financial support to foster effective learning (Gartner & Krašna, 2023). Unfortunately, many universities are unable to sustain such costs. This financial strain raises concerns about the long-term feasibility of integrating AI into the educational frameworks of Chinese universities (Yang et al., 2021). Another issue is the disparity in resource allocation, which results in unequal access to AI technologies, with students in wealthier universities often benefiting from these tools. At the same time, those in underfunded institutions are left behind. Qian and Xing (2020) note that many Chinese educational institutions face infrastructural challenges that hinder the adoption of AI technologies, particularly for vulnerable groups such as students with disabilities. This study aims to address the issues related to the effective use of inclusive AI in education, provide policies to strengthen the findings for universities, allocate resources equally, and give students with disabilities access to advanced learning tools to improve their academic performance. The successful integration of social inclusion in education settings tends to help promote students with disabilities, depending on lecturers' and students' acceptance and willingness to engage in campus activities that provide them with a sense of belonging (Li & Zheng, 2020; Otten et al., 2022; Rodríguez-Sánchez et al., 2023). However, many educators in Chinese universities lack the skills, training, and confidence needed to effectively integrate social inclusion practices into their lecturing practices, thereby making students with disabilities vulnerable (Liu et al., 2020). Without adequate understanding or support, educators are likely to experience resistance to change due to fear, unskilled in handling student interaction, diversity, equity and sense of belonging, thereby diminishing classroom participation and roles with students with disabilities, leading to poor academic performance (Chen & Zhang, 2020; Gonzalez & Deng, 2023). This study aims to address the gap in academic participation among students with disabilities and the importance of social inclusion in promoting academic performance.

According to Cao et al. (2024), providing students with the opportunity to excel and create a sense of happiness tends to reduce their stress levels and increase their effectiveness in learning, which is directly related to their academic performance. However, many students may disagree with the university's strategies for developing their well-being, which could pose a threat to their academic activities (Rahmat et al., 2023). Integrating artificial intelligence to enhance students' well-being requires substantial training for students with disabilities, as well as their educators, to help them understand AI's capabilities and how it can be effectively integrated into education (Katajavuori et al., 2023). Without such training, even the most advanced AI systems may not be utilised to their full potential, limiting their benefits to students with disabilities and frustrating the educator's lecturing (Yang et al., 2021). However,

the student may be unwilling to participate because they are unsatisfied, which can hinder their academic success. This study tends to address the issues relating to the effective implementation of well-being activities and encourage training to help bridge the gap between students with disabilities and educators by providing them with a positive attitude, resilience, and satisfaction towards managing their physical, mental, emotional, and social well-being in the pursuit of nurturing self-regulated, building resilience and facilitating decision-making, thereby positioning the success of student academic performance.

AI, social inclusion, and well-being play a vital role in improving academic achievement by boosting motivation, enriching learning experiences, and creating a fairer, more supportive environment for students with disabilities. AI-powered tools personalise learning, offer timely assistance, and cater to diverse needs, resulting in greater engagement and better educational results. Additionally, AI can foster social inclusion by providing access to educational resources and customised support for students with disabilities, different learning styles and backgrounds. These elements together can significantly influence academic success, with AI enhancing learning through personalisation and accessibility, while social inclusion and well-being foster conducive conditions for effective education for students with disabilities. However, it is important to address challenges such as digital fatigue, privacy issues, and ethical considerations to ensure the positive impact of AI in education while protecting the well-being of students with disabilities. Therefore, this study aims to investigate the impact of AI, social inclusion, and well-being on the academic performance of students with disabilities in China.

Literature Review

Academic Performance

Higher education institutions play a pivotal role in producing qualified human capital that enables the solution of real community problems (Maringa et al., 2024). Education is a powerful agent of change that enhances health and livelihoods, contributing to social stability. At the micro-level, it is associated with better living standards for individuals through improved productivity, given that those who have received a higher education tend to have more economic and social opportunities (Knof et al., 2024). At the macro level, education fosters well-informed and skilled human capital, which is considered an engine of economic growth that positively contributes to economic development (Jiang et al., 2022). However, gaining knowledge, attitudes, values, and skills through education is not a simple task; instead, it is a long and challenging journey in life. Students are expected to study on time and graduate with good academic results. The achievement of performance affects students' current and future lives, portraying their inherent productivity and ability (Mosharrafa et al., 2024). Students are taught accounting concepts and principles to develop analytical, solid skills, language skills, business, information and communication technology competence, and higher education value (Bao et al., 2023; Shi & Ko, 2023). However, other researchers confirmed that students' academic achievement is a "net outcome" of cognitive and non-cognitive attributes (Sunu & Baidoo-Anu, 2024). A study conducted by Meng et al. (2024) found that the quality of lecturing has a positive impact on students' performance, reflecting their human capital development and capability to excel in the global market. In addition, teamwork and brainstorming help boost the students' performance and prepare them to embrace their future career aspirations. Several studies have been conducted in different countries to assess the factors contributing to students' academic performance at different

levels (Ulivia et al., 2022; Yang et al., 2024). In China, Lai et al. (2024) found that the quality of education is primarily determined by the qualities imparted by lecturers in transferring skills and knowledge to their students. It also helps motivate students to achieve their academic career goals. Students' achievement increases when their lecturer receives adequate training to deliver quality lectures, which facilitates the accessibility of learning materials and creates substantial value for their students' academic performance (Romsil, Widodo, & Slamet, 2024).

Artificial Intelligence

Integrating Artificial Intelligence (AI) in education reshapes how students learn and interact with educational content (Taboada et al., 2023). AI technologies offer unprecedented opportunities to personalise learning experiences, provide real-time feedback, and adapt educational materials to meet the specific needs of individual learners (Carballo et al., 2023; Xie & Wang, 2024). This section explores the various applications of AI in education, including its benefits, challenges, and implications for students, particularly those with disabilities. AI encompasses a range of technologies, including machine learning, natural language processing, robotics, and computer vision. These technologies are increasingly utilised in educational settings to create more efficient and personalised learning environments (Wu et al., 2023; Contreras et al., 2023; Zhong et al., 2024). For instance, intelligent tutoring systems leverage machine learning algorithms to analyse students' learning patterns, preferences, and progress in real-time. This capability enables the system to adapt the content, pace, and delivery of instruction to meet the student's needs, resulting in a more personalised educational experience (Yu, 2023). Personalised learning through AI helped foster a sense of autonomy and agency among students. When learners have control over their learning paths and can progress at their own pace, they are more likely to engage with the material and take ownership of their education (Moriña & Orozco, 2023). It plays a crucial role in promoting advanced and adequate learning. It provides benefits for the state-of-the-art technology in learning acquisition, knowledge, and attention in lecturing. It influences students' ability to learn to the fullest (Yuan et al., 2023). On the other hand, AI's impact on students' academic performance constitutes an essential part of standard education and development. It explores the learning domain embedded in advanced technology through myriad learning applications. It provides detailed efforts and an overview of the learning development of students' competency performance and skills in the educational setting (Tian et al., 2023). On the other hand, AI's effect on students' academic performance helps identify the tools and power of analysis among struggling learners. It provides and improves student intervention and academic performance (Kee et al., 2024). It automates the educational process, streamlines the workflow for educators, and saves time and resources on routine administrative tasks. Artificial intelligence (AI) plays a crucial role in learning and developing technology in educational settings and society. It is crucial in the learning process because AI enhances students' learning and creativity.

H₁: There is a significant positive impact of artificial intelligence on the academic performance of students with disabilities.

Social Inclusion

Social inclusion is a crucial aspect of the educational experience for students with disabilities, as it encompasses the extent to which students feel a sense of belonging and participation within the academic community (Zheng et al., 2022). Social inclusion is another critical

dimension of the educational experience for students with disabilities (Gao et al., 2023). It refers to the extent to which students feel a sense of belonging within the academic community, can participate fully in campus life, and have meaningful interactions with peers and faculty. Inclusive education is a fundamental principle that aims to provide all students equal access to educational opportunities, regardless of their physical, sensory, cognitive, or emotional abilities. When dealing with inclusive educational settings (such as classrooms and universities), there is a question of how university-level inclusion outcomes can be operationalised. Of course, students' academic achievements are outcome factors of lecturing and learning (Bjørnerås et al., 2023; Wang et al., 2024). Therefore, students' performances in specific curriculum-related domains could be assessed to check whether inclusive lecturing approaches, such as differentiated instruction, are successful, considering outcome-oriented evaluation (Sun et al., 2023). The literature regarding the academic achievements of students with special educational needs has shown that they compare favourably to those of students who are segregated into classes or universities. They perform better academically when integrated into regular classrooms (Zheng et al., 2022; Smith et al., 2023). The academic performances of special educational needs students in inclusive classes are at least similar to the academic outcomes of special educational needs students in regular classes (Xiao et al., 2023; Song et al., 2024). However, measuring students' academic achievements is not the only way to operationalise the impact of inclusive education on students. As Xu and Yin (2022) pointed out, post-university options, effective inclusive lecturing practices, and students' socio-emotional development should also be considered alongside academic achievement. Tang (2024) found that social inclusion has a significant contribution to the development of academic performance. It further revealed that a lack of interaction, acceptance, and high isolation lead to poor academic performance. Devine (2023) investigated the relationship between academic achievement and inclusive education using nationally representative data on all Chinese students from the four key stages. However, a significant relationship was found between university inclusivity and academic achievement. Students' academic achievement was lower in universities with higher levels of students with disabilities. Overall, the results indicated that the presence of students with special needs did not have a statistically significant effect on the academic achievement of general education students in the university.

H₂: There is a significant positive impact of social inclusion on the academic performance of students with disabilities.

Students' Well-Being

As defined in this report, students' well-being refers to the psychological, cognitive, social and physical functioning and capabilities students need to live a happy and fulfilling life (Islam et al., 2022). In a typical learning environment, student well-being is influenced by four factors: instructors, course design, class climate, and resources. Interrelated and often interdependent factors influence student well-being across the spectrum of lecturing and learning (Sun & Liu, 2023). Well-being is a complex combination of a person's physical, mental, emotional and social health factors. Well-being is linked to happiness and satisfaction (Hamzah et al., 2023). According to Katajavuori et al. (2023), social well-being consists of five dimensions: social integration, social acceptance, social contribution, social actualisation and social coherence. Despite the elusive and overarching nature of well-being, its significance in education is well-established in the literature (Rahimah et al., 2022; Li et al., 2024). Students' positive and satisfying life experiences are expected to flourish as their well-being increases

(Siddiqui et al., 2023). Students' social well-being may be defined as the extent to which they feel a sense of belonging and social inclusion in their academic environment (Cao et al., 2024). The well-being of students with disabilities is another critical aspect that warrants attention. University life can be stressful for all students, but those with disabilities may experience additional pressures related to accessibility, academic performance, and social acceptance. Student tends to undergo mental stress during their engagement with fellow students, which tends to influence conversations about their feelings and provide coping strategies for managing stress. These well-being strategies help to monitor students' mental health and offer timely interventions, providing a more supportive educational environment. It would also be helpful to encourage students to reflect on their emotional state and suggest resources or coping mechanisms tailored to their specific needs. Moreover, fostering a supportive and inclusive campus environment is essential for promoting the well-being of students with disabilities. This involves creating awareness campaigns to reduce the stigma surrounding disabilities, providing training for faculty and staff on mental health issues, and ensuring that students have access to appropriate mental health resources (Li et al., 2024). Research has shown that solid or robust social well-being impacts young people's security and comfort and affects and contributes to positive adult functioning (Fu et al., 2023; Xu & Hu, 2024). Students' well-being and academic performance are also positively associated. The student's academic performance is vital in producing the best quality graduates who become great leaders and workforce members, thus contributing to the country's economic and social development (Fu & Tu, 2023). "Student success," used interchangeably with academic performance, encompasses academic achievement, attainment of learning objectives, acquisition of desired skills and competencies, satisfaction, persistence, and post-college performance (Qian & Yu, 2023; Xu & Hu, 2024). Evidence suggests that personality variables, such as loneliness, locus of control, mental and physical health, and other factors, including peer group, university or college environment, and acculturation, influence students' academic performance.

H₃: There is a significant positive impact of students' well-being on the academic performance of students with disabilities.

Conceptual Framework

The conceptual framework was derived from various theories and models related to AI, social inclusion, and academic performance. Additionally, we aim to explore the effects of AI, social inclusion, and well-being on the academic performance of students with disabilities in China.

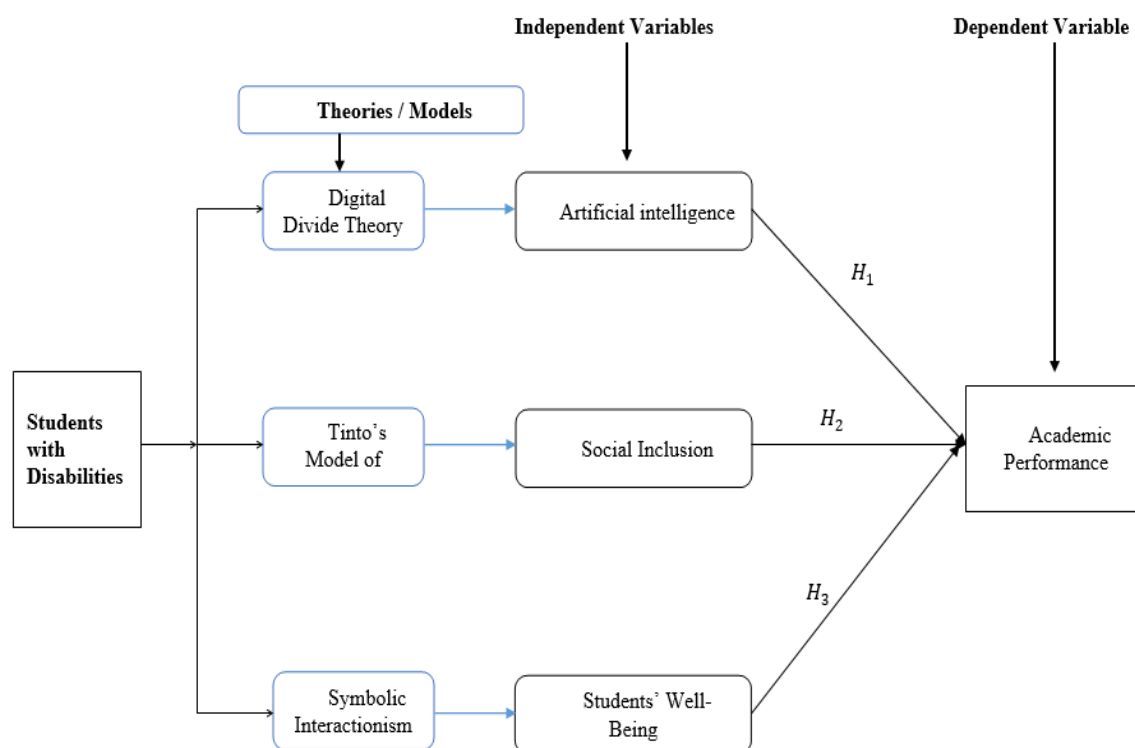


Figure 1 Conceptual Framework of the Study

Research Methodology

Sample Size and Population Procedure

Descriptive and correlational designs are adapted to suit quantitative research design and proffer solutions to the identified research questions (Kothari, 2019). The researcher adopted simple and stratified random sampling in data collection among students with disabilities. To determine the sample size of respondents for the target population, the researcher used a statistical table to support the sample size (Krejcie & Morgan, 1970). According to Krejcie and Morgan (1970), a target population of 37,000 students typically yields a sample size of 378 to 381, with a 5% margin of error and 95% confidence. The questionnaires consist of sections A to E. Section A focuses on the demographic data, which includes personal data such as age, gender, type of disability, year of study, and geographic region. Section B focuses on the dependent variable (academic performance), and Sections C to E focus on the independent variables (Artificial intelligence, social inclusion and students' well-being) with a 5-point Likert scale (Joshi et al., 2015; Dawes, 2012). The measurement of constructs and their Cronbach alpha of sources: academic performance (0.856), artificial intelligence (0.840), social inclusion (0.815) and student well-being (0.924) (Lauterbach et al., 2002; Eccles & Wigfield, 1995; Secker et al., 2009; Seligman & Csikszentmihalyi, 2001). The instrument's pilot study was conducted, which provided an acceptable level of reliable statistics, ranging from 0.729 to 0.905, for all variables. The questionnaires were administered and distributed face-to-face to the students with disabilities at Shandong Normal University to ensure adequate communication and interaction of their views on the root cause of this study (Flick, 2011). Of the 380 questionnaires distributed, 291 were successfully returned, yielding a 76.6% response

rate and success (Sekaran & Bougie, 2016). Therefore, the sample size of this study is 291, which met the statistical criteria required in this study.

Data Analysis

After the data collection was successfully collected and acquired on the factors influencing turnover intentions in the Nigerian banking sector, the Statistical Package for Social Science (SPSS) (version 28) was used to analyse the data generated for this study (Mark & Adrian, 2019). Firstly, descriptive testing was employed to determine the respondents' views on the profile of the employee turnover intentions. Secondly, normality testing, which involves assessing the skewness and kurtosis of values, was conducted to ensure that the data met the multicollinearity requirements and confirmed whether the data generated exhibited a normal distribution. Thirdly, the correlation analysis helps to effectively examine the relationship between artificial intelligence, social inclusion, students' well-being, and academic performance. Lastly, regression analysis helps to determine the effect of artificial intelligence, social inclusion, and students' well-being on academic performance among students with disabilities in Shandong Normal University, China.

Results

Demographic Data Analysis

Table 4.1 indicated that the age group of students with disabilities involved in this study, which 16 – 20 years 44.3% (129 respondents), 21 – 25 years 35.7% (104 respondents), 26 – 30 years 12.4% (36 respondents) and 31 years and above have 7.6% (22 respondents). In addition, the 16–20 age group comprises 44.3% (129 respondents), indicating the highest rate of participation in the study, which explores the effects of AI, social inclusion, and well-being on the academic performance of students with disabilities in China. Therefore, young students with disabilities are concerned about the factors that influence their academic performance, as these factors hinder the development of academic creativity, skills, and knowledge, physical and mental capabilities required to participate in the university environment, ultimately affecting their ability to provide adequate performance (Mappadang, Khusaini, Sinaga & Elizabeth, 2022).

The students with disabilities are categorised by gender in this study, as follows: males, 56.7% (165 respondents), and females, 43.3% (126 respondents). The study further indicated that male students with disabilities from Shandong Normal University had the highest participation rate. According to Chen, Gao and Liu (2021), males are more concerned and empathetic about students' well-being, as it directly influences their living standards due to high family responsibilities and poor academic performance. They are also concerned about the productivity of academic activities, curriculum, and lecturer feedback in harnessing the success of academic performance.

The type of student disabilities that participated in this study are as follows: physical, sensory impairment, learning and cognitive disabilities, which have contributed to the high rate of poor academic performance at the Shandong Normal University, China. The physical disabilities students have 24.4%, with 71 respondents, sensory impairment students have 27.5%, with 80 respondents, and learning disabilities students have 38.8%, with 113 respondents. Lastly, students with cognitive disabilities encountered a 9.3% rate, with 27 respondents who participated in this study. It further revealed that students with disabilities

with regards to learning deficiency and impairment 38.8% were considered as the highest set that participated in this study on the quest of promoting academic performance with the aid of introducing artificial intelligence, social inclusion, and students' well-being, to harness and improve the quality of academic that would reflect towards academic excellence.

The student year of studies at Shandong Normal University, with regards to the students with disabilities, further revealed that year 1 students have 41.2% with 120 respondents, year 2 students have 25.1% with 73 respondents and year 3 students have 33.7% with 98 respondents who fully participated and were involved in this study. It further showed that students with disabilities in the first year of studies have 41.2% and are considered the highest level of studies involved, as they are newly enrolled in the university. They are also concerned and intend to excel in their academic pursuit. According to Affuso et al. (2023), newly enrolled students are eager to enhance their academic performance, a crucial factor in attending any higher institution. Implementing artificial intelligence, promoting social inclusion, and enhancing students' well-being helped capture their willingness and productivity in contributing to their academic struggles and performance.

Students with disabilities are categorised based on the geographical regions from which they emanated to pursue their academic career at Shandong Normal University, China. In this study, rural regions and urban areas with students who have disabilities were involved. It further revealed that students with disabilities from rural regions, 46.7% with 136 respondents, and students from urban regions, 53.3% with 155 respondents, actively participated in this study in the quest to identify and explore the effects of AI, social inclusion, and well-being on academic performance for students with disabilities in China. The study revealed that students with disabilities from urban regions have the highest rate and exhibit a more significant concern about issues related to poor academic performance and ways to mitigate them, aiming to achieve academic success and excellence. Romsis, Widodo, and Slamet (2024) revealed that students from rural regions face various challenges that hinder their academic excellence, including financial constraints, a poor lifestyle, and limited access to academic loans for further studies in urban regions.

Table 1

Demographic Information

Items	Frequency (n = 291)	Percentage (%)
Age Group		
16 – 20 years old	129	44.3
21 – 25 years old	104	35.7
26 – 30 years old	36	12.4
31 years old and above	22	7.6
Gender		
Male	165	56.7
Female	126	43.3
Type of Disabilities		
Physical	71	24.4
Sensory Impairment	80	27.5
Learning	113	38.8
Cognitive	27	9.3
Students' Years of Study		
Year 1	120	41.2
Year 2	73	25.1
Year 3	98	33.7
Geographical Regions		
Rural	136	46.7
Urban	155	53.3

Normality Analysis

Normality testing examines whether the generated data follow a normal distribution or determines the likelihood that an underlying random variable is normally distributed (Zikmund et al., 2020). For this analysis to meet the criteria, all the constructs must fall between +1 and -1 (Kumar, 2014). The results of the Skewness and Kurtosis values are examined and analysed in this study. Besides, the Skewness and Kurtosis of artificial intelligence, social inclusion, students' well-being and academic performance ranged between ± 1 for skewness and ± 1 for kurtosis (Cumming, 2012). Hence, a Kolmogorov-Smirnov statistic with a Lilliefors significance level, yielding a p-value of 0.075, was found, which is greater than 0.05. The results yielded that the constructs are normally distributed. In addition, the skewness ranged from -0.401 to -0.687, and the kurtosis ranged from 0.210 to 0.921.

Table 2

Skewness and Kurtosis Values for all Constructs

Constructs	Final Test (n = 291)	
	Skewness	Kurtosis
Academic Performance	-0.401	0.921
Artificial Intelligence	-0.687	0.210
Social inclusion	-0.470	0.548
Student Well-Being	-0.642	0.410

Correlation Analysis

Correlation analysis helps examine the relationship between two or more variables to project the study's dependent variable (Bell, Alan, & Bill, 2019). In this study, the relationship between artificial intelligence, social inclusion, students' well-being, and academic performance. The results indicate that the constructs are significantly and positively correlated. Correlations among variables such as artificial intelligence, social inclusion, and students' well-being have "strong" and "very strong" correlations to academic performance as the dependent variable. This analysis further demonstrated that artificial intelligence, social inclusion, and student well-being can help promote the academic performance of students with disabilities, thereby supporting the university's policy of continuously improving the educational experience for students with disabilities to maximise their potential and instil confidence in academic performance.

Table 3

Descriptive Statistics and Correlations for all Constructs

Constructs	Mean	SD	1	2	3	4
1. AP	3.691	0.551	1			
2. AI	3.850	0.542	.935**	1		
3. SI	3.752	0.592	.962**	.909**	1	
4. SWB	3.815	0.576	.909**	.758**	.842**	1

Note: ** significant level at $p < 0.01$ (2-tailed)

AP: Academic Performance; AI: Artificial Intelligence; SI: Social Inclusion; SWB: Student Well-Being

Regression Analysis

Regression analysis indicates that an R^2 value of 0.71 or above must be met for the constructs to be recognised and accepted, further explaining the variabilities (Kothari, 2019). A construct range of 0.30 to 0.70 indicates moderate variability. Both the tolerance and VIF values have met the criteria stating that the value of VIF must be lower than 10.0 and the value of tolerance must be greater than 0.1 (Saunders, Lewis & Thornhill, 2019). Table 4 shows the positive effect of artificial intelligence on the academic performance of students with disabilities at Shandong Normal University, China. Artificial intelligence has a beta coefficient ($\beta = 0.362$; $p < 0.001$), indicating that it has a strong effect on academic performance and can help increase students' capabilities in promoting and harnessing academic success. The results showed that the model was considered good, with an adjusted R-squared value of 0.701, indicating a high 70.1% variability in the impact of artificial intelligence on academic performance. The collinearity statistics analysis confirmed that the artificial intelligence has a tolerance of 0.173 and a VIF of 5.791, which meets the criteria. Therefore, objective 1 of this study has been met, and the requirement has been achieved. Thus, H1 is accepted. Table 4 reveals the positive effect of social inclusion on the academic performance of students with disabilities at Shandong Normal University, China. Social inclusion has a beta ($\beta = 0.325$; sig. = 0.000, which is less than 0.001) and indicates that social inclusion strongly affects academic performance, which would help increase students' capability in promoting, providing feedback, and assessing the lecturer's contribution towards enhancing their academic performance. The results showed that the model was considered good, with an adjusted R-squared value of 0.781, indicating that its impact on academic performance explains 78.1% of the variability in social inclusion among students with disabilities. However, the collinearity

statistics analysis confirmed that social inclusion has a tolerance of 0.118 and a VIF of 8.459, which meets the criteria. Thus, social inclusion is significant to academic performance. Therefore, objective 2 of this study has been met, and the requirement has been achieved. Thus, H2 is accepted. Table 4 asserted the positive effect of student well-being on the academic performance of students with disabilities at Shandong Normal University, China. The student well-being has a beta value of 0.253 (sig. = 0.000, which is less than 0.001). It indicates that student well-being has a significant impact on academic performance, enhancing students' ability to promote and achieve academic success. The results showed that the model was considered good, with an adjusted R^2 of 0.798, indicating that their academic performance explains 79.8% of the variability in student well-being among students with disabilities. The collinearity statistics analysis confirmed that student well-being has a tolerance of 0.291 and a VIF of 3.438, which meets the tolerance and VIF values criteria. Therefore, objective 3 of this study has been met, and the requirement has been achieved. Thus, H3 is accepted.

Table 4
Regression Analysis

Model	Standardised Coefficients	t	Sig.	Model Summary		Collinearity Statistics		
	Beta			R	R ²	Tolerance	VIF	
1	(Constant)	-2.727	0.007					
	Artificial Intelligence	0.362	5.573	0.000	0.782	0.701	0.173	5.791
	Social Inclusion	0.325	4.150	0.000	0.800	0.781	0.118	8.459
	Student Well-Being	0.253	5.052	0.000	0.812	0.798	0.291	3.438

a. Dependent Variable: Academic Performance

Discussion

The results revealed a positive impact of artificial intelligence on the academic performance of students with disabilities at Shandong Normal University, China. Objective 1 of this study revealed that it has a strong effect on academic performance and can help increase students' capabilities in promoting and harnessing academic success. Students with disabilities believe that implementing and harnessing artificial intelligence would enhance students' performance, brainstorming, teamwork, and overall excellence, as reflected in their daily tasks and academic performance at universities in China (Chen, Gao & Liu, 2021). The positive impact of artificial intelligence signifies that students with disabilities perceive it as a tool and an additional strategy that can enhance their contributions and efforts towards promoting their academic performance and success (Holmes & Tuomi, 2021). It is perceived as a critical factor that empowers students with disabilities to enhance their creativity and innovation in the university. Artificial intelligence helped harness the capabilities and capacities of students with disabilities to manage their academic activities, thereby promoting academic performance (Bittencourt et al., 2023). Hence, this study emphasised the relationship between the implementation of artificial intelligence and its usage on students' academic performance, specifically focusing on the areas of smarter content delivery, support and assistance, attitude improvement towards learning, and motivation enhancement.

Objective 2 of this study showed the impact of social inclusion on the academic performance of students with disabilities. Social inclusion has a beta ($\beta = 0.325$; sig. = 0.000, which is less than 0.001). The results indicate a positive impact of social inclusion on the academic performance of students with disabilities at Shandong Normal University, China. Students with disabilities from Shandong Normal University believed that social inclusion helped enhance students' feedback, assessment, and productivity, thereby reflecting the university's reputation and recognition based on students' academic performance and success (Abamosa, 2023). The positive impact of social inclusion indicates that students with disabilities perceive it as a strategy that encourages higher participation in related academic activities, thereby significantly improving their academic performance (Devine, 2023). It was agreed that empowering students with disabilities is a critical factor in enhancing their creativity, critical thinking, and innovative strategies, thereby harnessing and nurturing the academic excellence process (Gonzalez & Deng, 2023). Social inclusion helped to harness students' capabilities and capacities through adequate feedback, assessment, and improvement in managing their academic activities, thereby reflecting academic performance (McKenzie & Khan, 2023). Results revealed that legibility, social relations, hostel quality, facilities, extracurricular activities, accessibility, safety, comfort, academic services, and transportation affect student inclusion at university campuses.

Objective 3 of this study showed the impact of student well-being on the academic performance of students with disabilities. The findings demonstrated a positive impact of student well-being on the academic performance of students with disabilities at Shandong Normal University, China. The student well-being has a beta value of 0.253 (sig. = 0.000, which is less than 0.001). The results showed that the model was considered good, with an adjusted R-squared value of 0.798, indicating that their academic performance explains 79.8% of the variability in student well-being among students with disabilities. Finally, student well-being was found to be a significant predictor of academic performance as the dependent variable. Thus, student well-being is significant in promoting academic performance. It further agreed that student well-being has a significant impact on academic performance, enhancing students' ability to promote and achieve academic success. Students with disabilities perceived and agreed that improving the quality of student well-being would add value to their academic struggle, nurture their teamwork, the collaboration of ideas and knowledge, and create an innovative path for students to nurture and improve that would drastically promote their academic performance (Islam, Akter, Sikder & Griffiths, 2022; Cao, Zhang, Li & Xie, 2024).

Conclusion

AI offers significant promise for improving the academic performance of students with disabilities, particularly through personalised learning and assistive technologies. This study concluded that improving artificial intelligence has a positive impact on academic performance. It concluded that enhanced artificial intelligence has offered personalised learning experiences, improved writing skills, and increased productivity through various AI-powered platforms and tools towards harnessing academic performance for students with disabilities. This study has provided customised guidance and support to students, answering questions and offering targeted feedback that nurtures and improves the academic performance of students with disabilities. It further empowered students to seek help whenever needed and encouraged self-directed learning. Additionally, this study concluded

that effective implementation of artificial intelligence has helped to create more interactive and engaging learning experiences by personalising education, providing intelligent tutoring systems, and automating tasks, thus freeing educators' time for more individualised instruction to improve academic performance among students with disabilities. The study agreed that AI-powered tools have aided reading, writing, and communication, making learning more accessible and empowering for students with diverse needs, thereby enhancing their academic performance. This study concluded that social inclusion has helped students' progress in a way that ensures everyone participates fully in the university, enjoys a decent standard of living, and has access to resources and opportunities to promote academic performance. In addition, this study asserts that social inclusion has helped empower students with disabilities, ensuring they have equal opportunities and access to various activities and interactions with their peers, both inside and outside the classroom, for effective academic excellence and performance. This study agreed that students with disabilities need opportunities to interact with diverse peers in various settings, both within and outside the school, to harness and nurture their academic performance. This study concluded that social inclusion has a positive impact on ensuring that learning environments are physically accessible and that academic content is available to all students, regardless of disability, thereby fostering academic excellence and performance. This study found that student well-being has a significant positive impact on the academic performance of students with disabilities. It further asserted that improving student well-being has helped promote the creation of inclusive and supportive environments that address their unique needs and challenges, ultimately boosting their social, emotional, and academic performance. This study concurred that student well-being is enhanced by physical and digital accessibility to learning environments and resources, creating a welcoming and inclusive environment where students feel valued and respected. It also provides safe and supportive spaces where students can feel secure and have access to support services, thereby improving the academic performance of students with disabilities. This study agrees that student well-being has empowered students with disabilities by providing opportunities to develop social skills, build positive peer relationships, and enhance their emotional regulation and academic performance skills. This study is significant in addressing the gap identified in previous studies, while contributing to the body of knowledge and promoting the academic performance of students with disabilities in China.

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