



Test Anxiety, Autonomy, and Academic Performance: A Comparative Study of Students with Visual Impairment Using Human Writers versus Assistive Technology During Examinations

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ARTICLE INFO	ABSTRACT
Received: June 01, 2026 Revised: June 16, 2026 Accepted: July 02, 2026 Available Online: July 17, 2026 Keywords: Visual Impairment, Assistive Technology, Human Writers, Test Anxiety, Autonomy, Academic Performance Corresponding Author: Saiqa Khalid Email: saiqakhalidsaiqakhalid@gmail.com	This study examines the impact of examination accommodations on the psychological and academic experiences of university students with visual impairments in Pakistan. It particularly aims at comparing how human writers (scribes) and assistive technologies influence test anxiety, perceived autonomy, and performance. A quantitative research design was used, based on a cross-sectional survey method. A standardized questionnaire was used to gather data on 101 visually impaired students in higher education institutions with key variables being test anxiety, learner autonomy, academic performance, and type of examination accommodation. The purpose of the study was to determine the difference in the experience of students depending on the kind of accommodation they used during exams. Students with assistive technology reported greater levels of autonomy and independence since they could directly engage with examination material. Conversely, learners who used human writers indicated a reduction in autonomy and experienced problems with communication, time management, and reliance during tests. Independent Samples t-tests, one-way ANOVA statistical analyses indicated that there were statistically significant differences in test anxiety, perceived autonomy, and academic performance depending on the type of accommodation and demographic variables. The findings also revealed that better academic performance was related to increased autonomy and reduced anxiety. Moreover, the institutional support, access to assistive technologies, and access to trained staff were also named as significant determinants of the overall experiences of students. The results can be of benefit to policymakers, educators, and institutions as they can be used to formulate evidence-based policies to ensure more equitable, accessible, and inclusive assessment systems in higher education.

Introduction

Higher education is clearly seen as an important part of educational equity and social justice and inclusive higher education is a key focus. In spite of the international commitments on inclusive education, including the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), students with visual impairment are still underrepresented in higher education, especially in developing countries. This is why these students remain disadvantaged for their academic, environmental, and psychological involvement and achievement in higher education (World Health Organization WHO, 2022). Evaluation is an essential part of the

learning process, but traditional testing methods are typically based on sighted students' abilities. While the provision of extra time, alternative formats, and human writers is a common practice, it does not always meet the needs of students with visual impairment and can even cause them difficulties in their performance and well-being (Karagianni & Drigas, 2023). Test anxiety is a psychological issue that is important to consider when examining performance, as it involves a range of concerns, such as worry, fear of failure and emotional stress, that can hinder concentration, memory and performance (Putwain & von der Embse, 2021). The anxiety level may be heightened for visually impaired students for access to examination materials, use of external assistance and concerns about response accuracy.

In the past, human writers (scribes) have been used when students have a visual impairment and need assistance during exams. The use of scribes, however, can lead to higher cognitive load, a loss of student privacy and independence, and discrepancies in the work done because of differences in the scribes' skills and training, which could impact student performance and confidence (Kumar & Singh, 2021). Assistive technologies like screen readers, speech to text software, refreshable brailles or accessible digital examination platforms offer greater opportunities for self-assessment. This is especially the case in the context of learner autonomy. Self-Determination Theory (SDT) is a fundamental psychological need linked to motivation, well-being, and academic performance, which is autonomy (Ryan & Deci, 2020). Based on the research, it has been found that technology-based accommodations could positively impact the level of autonomy, self-efficacy, and academic performance among students with visual impairments, while also decreasing their anxiety (Hersh & Mouroutsou, 2022; Mansy et al., 2023). However, in developing countries like Pakistan, financial constraints, poor infrastructure, lack of training and institutional supports still restrict the use of AT. Recent inclusive assessment strategies such as Universal Design for Learning (UDL) focus on creating less rigid and more accessible assessment practices from the beginning, while providing accommodations to diverse learners, and not only individual accommodations (CAST, 2018; Rao et al., 2021). Although inclusive practices are gaining ground, few studies have explored the connection among test anxiety, self-reliance, and grades of students with visual impairments in the context of various kinds of examination accommodations (Khodabakhshi-Koolae & Malekitabar, 2024). Although there are policies in place in Pakistan to support students with disabilities, the implementation is inconsistent across higher education institutions. Most of the research work has concentrated on access issues and resource issues, and there is not a lot of comparative evidence on the effectiveness of human writers and assistive technologies for examinations. This study aims to examine the relationship between test anxiety, learner autonomy and academic performance of students with visual impairments in the use of human writers and AT in exams. The results will help develop more inclusive, equitable, evidence-based assessment practice in higher education.

Research Objectives

- To assess the level of anxiety among students with visual impairment who use human writers during examinations.
- To assess the level of test anxiety among students with visual impairment who use assistive technology (e.g. laptops, screen readers) during examinations.
- To compare the test anxiety levels between students using human writers and those using assistive technology.
- To examine the perceived autonomy of students with visual impairment in both accommodation groups during examinations.
- To compare academic performance outcomes between students using human writers and those using assistive technology.
- To examine the relationship between perceived autonomy and test anxiety among students with visual impairment.
- To investigate the relationship between perceived autonomy and academic performance among students with visual impairment.

Literature Review

Students with a visual problem face many academic, technological and psychological difficulties that affect their learning process and achievement in higher education. Inclusive education policies have promoted the access to higher education, but there are still some barriers that limit the access of students to higher education, including inaccessible learning materials, limited assistive technologies in universities, inflexibility of assessment procedures, and lack of institutional support. These challenges can hinder independent learning and participation in learning, as well as suggest that academic success is not only a function of intellectual ability, but access to learning environments and the effectiveness of support services (Ali & Bhatti, 2021; Douglas et al., 2019; Seale, 2021). Test anxiety is one of the most empirical predictors of academic performance among the psychological factors affecting academic achievement. Test anxiety is the cognitive, emotional and physical reactions that occur prior to or during a test, such as worrying, nervousness and fear of failure. High levels of anxiety have been shown to negatively impact concentration, working memory, information processing and problem solving, all of which affect students' ability to show what they truly know in assessments (Cassady & Johnson, 2021; Putwain et al., 2021).

Based on Cognitive Interference Theory, anxious thoughts take up information-processing resources that otherwise could be utilized in an effective way to retrieve information and organize responses (Sarason, 1988). Test anxiety can be exacerbated for students with a visual impairment due to disability-related barriers. The issues of examination material difficult to access, lack of a suitable accommodation, communication with the human writer and doubts regarding accuracy of the transcription may lead to an increase of emotional stress for the student in the examination process (Kelly & Moore, 2021). This can lead to lowered confidence and control of the assessment process for the students, which negatively impacts their success. Researchers, however, have found that providing a supportive learning environment, appropriate assessment systems, and the necessary accommodations can help students have a less threatening educational experience (Putwain et al., 2021; Kelly & Moore, 2021). Another consideration that plays a role in academic success is with regard to learner autonomy. It is about the student's ability to demonstrate responsibility for his/her learning behavior, including goal setting, the use of suitable learning strategies, monitoring learning and the self-assessment of learning results. Students who learn autonomously tend to be more motivated, self-regulated and have more confidence, thus being able to handle academic tasks more effectively (Ryan & Deci, 2020; Zhong, 2018).

The research findings show that the development of learner autonomy is the result of teaching that is supportive, the learning environment is accessible and opportunities for independent learning are provided, but not the condition of being completely free from teachers. A learner's autonomy is closely related to accessibility and availability of appropriate educational resources for the student with visual impairment. Self-confidence and learning engagement are increased when the students can use the course material on their own, complete their assignments and take part in examinations. However, relying too heavily on external support can reduce the potential to develop and reinforce self-regulated learning skills and dependency. In addition, previous research has found that students who have higher levels of learner autonomy have lower test anxiety, as they are more confident, possess effective coping mechanisms, and have a more comprehensive control over learning process (Cassady & Johnson, 2021; Chowdhury & Abdullah, 2023).

Performance in the field of studies is a multi-faceted result determined by the psychological, technological and institutional factors. In addition to test scores, it measures students' knowledge acquisition and critical thinking abilities, as well as their successful engagement in learning activities. Students with VI often face challenges in accessing learning materials, the availability of assistive technologies, and the support or assistance from the institution, which may affect their learning outcomes (Douglas et al., 2019). Findings from the research consistently show that lower levels of test anxiety, higher levels of learner autonomy, and accessible learning environments have a positive impact on academic engagement and performance, making it important to provide equitable educational opportunities that will allow visually impaired students to reach their academic potential (Ali & Bhatti, 2021; Chowdhury & Abdullah, 2023). Exam accommodation is a key factor in equitable assessment in higher education for students who have a visual impairment. Traditionally, the most common accommodation has been by human writers (scribes), especially in developing countries where assistive technology is not widely used. Human writers support students by reading questions on exams and taking notes of students' verbal answers to finish written tests for students with visual disabilities. The aim of this accommodation is to eliminate barriers to disability and to ensure that the assessment is based on the student's knowledge, not his inability to read and write in print (Douglas et al., 2019; Alghamdi & Alanzi, 2022).

The use of human writers can enhance examination accessibility, but how effective they are will depend on how well they are implemented. Students will be expected to express their answers orally, potentially disrupting their thinking patterns and raising cognitive load on exams. The reliability of the assessment results may be affected by differences in the communication skills, transcription accuracy, and experience with examinations between different scribes. Furthermore, relying on someone else can affect students' privacy, confidence, and independence, and can lead to concerns regarding transcription errors and fairness (Nieminen, 2024; Parsons, 2021). These can lead to increased test anxiety and restricted development of learner autonomy. As assistive technology becomes more accessible, learning opportunities for students who are visually impaired have undergone significant change.

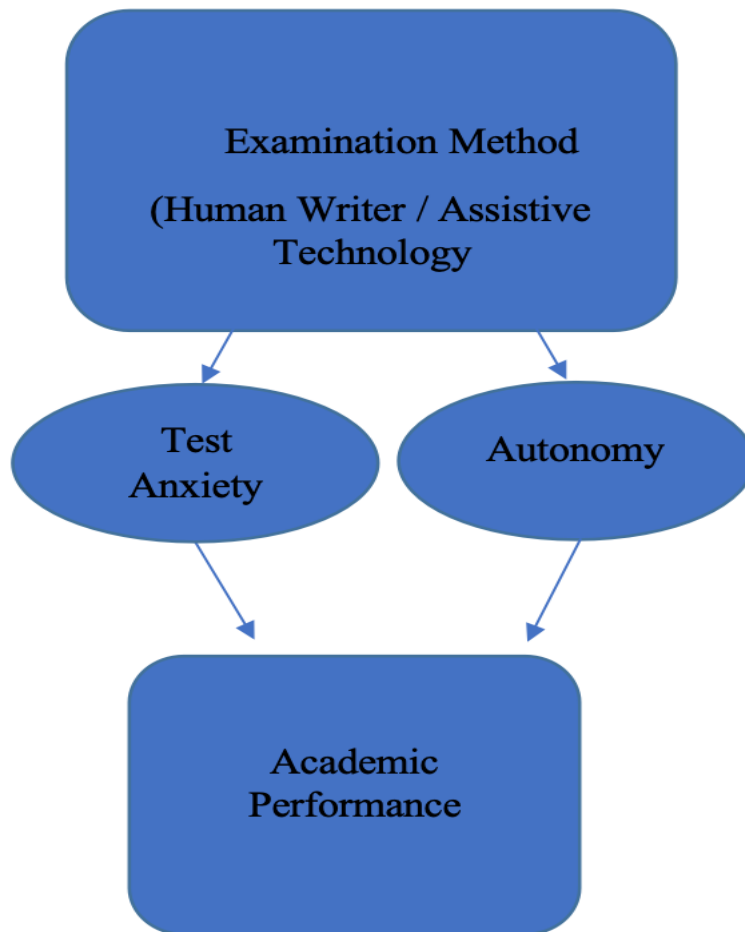
Examination technologies like screen readers, speech-to-text software, refreshable Braille displays, optical character recognition, and accessible digital learning platforms facilitate students to access learning content and complete exams on their own. Assistive technology, by enabling students to engage firsthand with the educational material, decreases reliance on human support systems and fosters student self-control, self-confidence, and participation in learning (Chowdhury & Abdullah, 2023; Seale, 2021). Students who know about these technologies tend to feel more in control of the assessment process, to show more self-regulation and have less examination anxiety. In addition to examinations, AT can promote independent learning by enhancing access to academics, communication, research and digital literacy skills. These benefits not only affect the immediate academic performance but also the lifelong learning and professional development. But the implementation of assistive technology is dependent on the commitment of the institution, awareness of the faculty, provision of adequate infrastructure, technical support, and constant training of students and faculty.

Despite the availability of assistive technology, financial difficulties, inadequate technology support, and lack of training are still limiting the use of AT in many higher education institutions, especially in Pakistan, leaving students to rely on traditional accommodations (Seale, 2021; Chowdhury & Abdullah, 2023). Comparative research suggests that human writing and assistive technology both increase the participation in examinations, but that they have very different impacts on independence and academic outcomes. Where technology is not available, students still rely on other people during the assessment process, and human writers have a continued value. Assistive

technology, on the other hand, helps students read the examination questions, write the answers, reread and review their work, and time manage. This improved independence boosts the learner's independence, increases learner confidence, lessens the test anxiety, and improves academic performance (Chowdhury & Abdullah, 2023; Kelly & Moore, 2021). However, researchers note that the success of each of these can vary based on student needs and technological skills, as well as institutional support; thus, flexible accommodation policies are needed to guarantee equitable assessment practices. Although there has been progress on inclusive education at an international level, development of disability support services is not uniform in developing countries like Pakistan.

The Higher Education Commission (HEC) and national disability policies promote the reasonable accommodations for students with visual impairment, including extra examination time, human writers, assistive technologies, and disability support services. However, the availability and quality of these services are quite different in different institutions due to financial constraints, limited technological infrastructure, lack of training of faculty and lack of awareness of inclusive education practices (Government of Pakistan, 2002; Fichten et al., 2019). Access to assistive technology (AT) is still one of the most significant challenges for the visually impaired student to learn independently. Many assistive devices are costly, low in technical support, lacking in training, and inaccessible in the digital environment, limiting students' use of technology for learning and assessment. As a result, a significant number of students remain with human writers even in the face of educational advantages of assistive technologies.

This dependency can affect the autonomy of students, their test anxiety and affect their ability to acquire independent academic and digital skills needed in higher education (Seale, 2021; Chowdhury & Abdullah, 2023). Students with visual impairment face additional barriers within their institutions that impact their learning experiences. However, disability support services in many universities are underdeveloped and practices for providing support vary between institutions due to variations in the implementation of policy and lack of monitoring. The differences put students at unequal learning opportunities and limit independent involvement in learning activities. It has been found that universities with accessible learning environment, trained teachers and appropriate technological support have better educational outcomes and more satisfied students than those that mainly use traditional support (Ali & Bhatti, 2021; Fichten et al., 2019).



Methodology

A quantitative cross-sectional survey design was used in this study to investigate test anxiety, learner autonomy, and academic performance of students with visual impairments and to compare students who wrote their test with human writers with students who used assistive technology aid to write their tests. The quantitative data was obtained using a structured questionnaire which enabled statistical analysis of the study variables and group comparisons. A total of 101 students with visual impairments were students of public and private universities of Punjab, Pakistan with 93 students belonging to public universities and 8 students from the private universities. The selection of the universities was made using purposive sampling and census sampling was used to include all eligible students. This strategy provided opportunity for humans and assistive technology to write on behalf of students. A structured questionnaire was used to gather data including demographic data and standardized scales on test anxiety and learner autonomy. Test anxiety was measured on a five point Likert scale and the learner autonomy was measured on a four point Likert scale. To test the clarity and reliability of the instrument, a pilot study was carried out with 20 students. Some minor revisions were made based upon the comments of the participants. The test anxiety scale of the instrument was shown to have Cronbach's alpha value of 0.817 while the learner autonomy scale had a Cronbach's alpha value of 0.910, which showed good reliability. Data collection was done after obtaining permission from the universities of choice. The participants gave informed consent and consent to participate. The confidentiality of the study and the anonymity of the respondents were ensured and only used for research purposes throughout the study.

Data Analysis

The Statistical Package for the Social Sciences (SPSS) was used to analyze the data. Participants' characteristics and study variables were summarized using descriptive statistics (frequencies, percentages, means and standard deviations). Independent-samples t-tests were performed to compare differences between gender, university type, type of visual impairment, and examination accommodation, while one-way Analysis of Variance (ANOVA) was used to compare differences across age groups, degree program, academic year, and academic performance categories. A p value less than .05 was considered to be statistically significant.

Demographic Analysis

Table 1: Frequency Distribution of Demographic Characteristics of Respondents

Catogery	Respondant	Frequency	Percentage
Gender	Male	56	55.4%
	Female	45	44.6%
Age	18-22 years	31	30.7%
	23-27 years	52	51.5%
	28 & above	18	17.8%
Degree Program	Bachelor's	56	55.4%
	Master's	37	36.6%
	PhD	05	5.0%
	Others	03	3.0%
University Type		Number of students	
	Public	93	92.1%
	Private	08	7.9%
Degree	1st year	17	16.8%
	2nd year	35	34.7%
	3rd year	21	20.8%
	4th year	28	27.7%
Type of visual impairment	Totally Blind	52	51.5%
	Low vision	49	48.5%
Examination Accommodation	Human Writer	63	62.4%
	Assistive technology	38	37.6%
Academic Performance	Below 2.5	7	6.9%
	2.5-3.0	13	12.9%
	3.1-3.5	47	46.5%
	3.6-4.00	34	33.7%

The demographic characteristics of the respondents showed that 55.4% of the respondents were males and 44.6% were females. With regard to age, most participants (51.5%) were 23-27 years old, 30.7% were 18-22 years old and 17.8% were 28 years or older. The majority (55.4%) of the respondents were enrolled in Bachelor programs followed by Master programs (36.6%) and a smaller proportion in PhD and other programs. A vast majority of the participants (92.1%) were public universities while the remaining 7.9% were private

universities. In terms of academic year, most participants were from the 2nd year (34.7%) and 4th year (27.7%), followed by 3rd year (20.8%) and 1st year (16.8%). As far as visual impairment, 51.5% were totally blind and 48.5% were low vision. 62.4% of the students used human writers to support their examination, while 37.6% used assistive technologies. In terms of academic performance, the majority of students had CGPAs between 3.1–3.5 (46.5%) and 3.6–4.0 (33.7%), indicating a generally moderate to high academic achievement among participants.

Table 2: Descriptive Statistics for Test Anxiety Items (n = 101)

Items	Mean	Sd
When I am taking a test or exam... I think I am going to get a bad mark or grade.	1.62	.59
When I am taking a test or exam... I worry about what my parents/careers will say.	1.48	.78
When I am taking a test or exam... I worry about failing.	1.45	.74
When I am taking a test or exam... I worry about doing something wrong.	1.59	.69
When I am taking a test or exam... I wonder if I will pass.	1.73	1.01
When I am taking a test or exam... I think most of my answers are wrong.	1.48	.55
When I am taking a test or exam... I worry about how hard the test is.	1.68	.72
When I am taking a test or exam... I think that I should have studied more.	1.94	1.09
When I am taking a test or exam... I wonder if my answers are right.	1.58	.88
When I am taking a test or exam... I check the time.	1.83	1.10
When I am taking a test or exam... I find it hard to sit still.	1.57	.65
When I am taking a test or exam... I tap my feet.	1.34	.59
When I am taking a test or exam... I play with my pencil.	1.22	.54
When I am taking a test or exam... I will try to finish it quickly.	1.71	1.02
When I am taking a test or exam... I feel nervous.	1.62	.81
When I am taking a test or exam... My head hurts.	1.49	.78
When I am taking a test or exam... My face feels hot.	1.43	.65
When I am taking a test or exam... I feel warm.	1.54	.78
When I am taking a test or exam... my hand shakes.	1.37	.59
When I am taking a test or exam... My belly feels funny.	1.29	.62
When I am taking a test or exam... I have to go to the bathroom.	1.14	.55

Table 3: Descriptive Statistics for Autonomy Items (n = 101)

Items	Mean	Sd
I feel more independent when I use assistive technology in exams compared to relying on a human writer.	1.62	.59
Using a human writer makes me feel less in control of my exam responses.	2.99	1
I can better express my own ideas when I use assistive technology during exams.	3.85	1.53
Depending on a human writer limits my sense of autonomy.	3.45	1.62
I prefer having full control over pacing my exam (e.g., checking answers, managing time) without relying on another person.	3.53	1.65
I feel more confident when I manage the exam process independently (e.g., reading, writing, reviewing).	3.87	1.54
Using assistive technology allows me to demonstrate my actual abilities more accurately.	3.77	1.63
I feel my exam performance depends too much on another person when I use a human writer.	3.00	1.72
I value being able to complete exams without external influence on my answers.	3.31	1.76
Autonomy in examinations (being self-reliant) is important for my academic success.	3.80	1.46
I feel more anxious when I depend on a human writer to record my answers.	3.22	1.66
I worry that a human writer may not capture my exact ideas during exams.	3.22	1.71

The test anxiety experiences of students with visual disability while taking exams are shown in table 2. The results showed a greater amount of cognitive and emotional symptoms than physical reactions. Concern about preparation, time management and exam outcomes were displayed in the highest mean scores, with a mean of 1.94 for a feeling of having to study more; 1.83 for checking the time during exams; and 1.73 for worrying about passing. Nervousness, fear of mistakes and self doubt were also common. The mean scores for physical and behavioral symptoms (shaking hands, tapping feet and frequent need to use the bathroom) were comparatively lower. Overall, the findings indicate that test anxiety among the visually impaired students is largely manifested in cognitive and emotional rather than physical symptoms. In section 2 (perceived autonomy) displays students' perceptions of autonomy when taking assessment exams with assistive technology and human writers. The results indicate that AT was linked to increased independence, confidence, and control. Pupils felt more confident in taking exams unaided ($M = 3.87$), more able to communicate ideas using assistive technology ($M = 3.85$) and more aware of the importance of autonomy in learning achievement ($M = 3.80$). Students appreciated both the pacing of the

exam ($M = 3.53$) and the use of human writers ($M = 3.45$); however, some felt that relying on human writers would limit their sense of independence ($M = 3.45$). The results as a whole demonstrate that AT is a tool to support students with visual impairment to become more autonomous and independent in using such technology, while human writers could pose problems of independence and control.

Independent Sample t-test

Independent sample t- test for test anxiety and autonomy by gender, type of universities, type of visual impairment and examination accommodation.

Factors	Variables	Group	Mean	t-value	p-value
Gender	Test anxiety	Male	31.01	-1.79	.76
		Female	33.66		
	Autonomy	Male	42.23	.545	.58
		Female	40.62		
Type of universities	Test Anxiety	Public	32.34	0.67	.504
		Private	30.50		
	Autonomy	Public	41.52	0.28	.978
		Private	41.37		
Type of visual impairment	Test Anxiety	Totally Blind	33.65	2.05	.042
		Low vision	30.65		
	Autonomy	Totally Blind	42.09	.408	.684
		Low Vision	40.89		
Examination Accommodation	Test Anxiety	Human writer	30.85	-2.38	.019
		Assistive technology	34.42		
	Autonomy	Human writer	41.38	-.117	.907
		Assistive technology	41.73		

Four independent samples t-tests were carried out to compare test anxiety and autonomy by gender, institution type, level of visual impairment and examination accommodation. There were no significant differences in test anxiety and autonomy between the male and female students or between the public and private institutions students (all $p < .05$). However, the perceived severity of VI was significantly higher in male students than in female students ($p = .003$). Results indicated significant differences between level of examination accommodation and test anxiety. The mean scores for test anxiety for the students with total blindness and those with low vision were significantly different ($t = 2.05$, $p = .042$). Likewise, students with assistive technology also reported higher test anxiety scores than did students with human writers ($t = -2.38$, $p = .019$). No difference was observed between these groups in terms of autonomy (all $p > .05$), however. In general, it can be concluded that there were no significant relationships between test anxiety and autonomy with the variables of gender and type of institution, while the variables of the severity of visual impairment and examination accommodation were related to test anxiety but not to autonomy.

One way ANOVA

Factor	Variables	Groups	Sum of Square	Df	Mean square	F	Sig
Age	Test Anxiety	Between Groups	5.651	24	.235	.914	.583
	Test Anxiety	Within Groups	9.57	76	.285		
	Autonomy	Between Groups	10.82	42	.258	1.038	.442
	Autonomy	Within Groups	14.40	58	.248		
Degree Program	Test Anxiety	Between Groups	9.941	42	.237	.415	.998
	Test Anxiety	Within Groups	33.10	58	.571		
	Autonomy	Between Groups	7.741	24	.323	.694	.842
	Autonomy	Within Groups	43.05	76	.465		
Year	Test Anxiety	Between Groups	7.74	24	.323	.694	.842
	Test Anxiety	Within Groups	35.30	76	.465		
	Autonomy	Between Groups	50.08	24	2.08	1.64	.054
	Autonomy	Within Groups	96.70	76	1.27		

One-way ANOVA was conducted to examine differences in test anxiety and autonomy across age groups, degree programs, and academic years among students with visual impairment. The results indicated no significant differences in test anxiety or autonomy across age groups (test anxiety: $F = 0.914$, $p = .583$; autonomy: $F = 1.038$, $p = .442$), degree programs (test anxiety: $F = 0.415$, $p = .998$; autonomy: $F = 0.694$, $p = .842$), or academic years (test anxiety: $F = 0.694$, $p = .842$; autonomy: $F = 1.64$, $p = .054$). These findings suggest that age, degree program, and academic year were not significantly associated with variations in test anxiety or perceived autonomy among students with visual impairment.

Discussion

This study investigated test anxiety, independence, and achievement outcomes for students with VI who receive various testing accommodations. The results show that examination accommodations affect students' autonomy and their learning experiences. The students who used assistive technology said that they were more autonomous than the students who used human writers, indicating that the use of assistive technology leads to increased independence and self-control during exams. The results are similar to those reported by other previous studies that showed the use of AT increases students with disabilities' autonomy, participation and self-determination (Fichten et al., 2019; Al-Azaawi & Serenelli, 2020). Relying on another person for writing is also needed when students don't have assistive technology, but it can significantly decrease their independence and self-esteem during examinations. The same things have also been found in previous research, revealing that support from people can lead to decreased autonomy and self-confidence (Lombardi et al., 2021; Zhang and Rosen, 2021). The results also imply that examination accommodations that promote independence may help students' performance and reduce test anxiety by allowing students to show their skills more effectively. The findings are consistent with earlier studies, which showed the positive impact of the availability of assessment practices and assistive technologies on the learning outcomes and anxiety levels of pupils with disabilities (Ok & Rao, 2019; Park et al., 2021; Al-Azaawi & Serenelli, 2020). Overall, the study underscores the significance of offering proper examination supports to enable the assessment of students with visual impairment in a fair manner. If access to ATs can be increased and trained human writers are available as necessary, it is important that this will also help to foster autonomy, alleviate test anxiety and improve the success of higher education students.

Conclusion

The effect of examination accommodations on test anxiety, autonomy, and academic performance for students in higher education with a visual impairment was investigated. The results show the significant impact of examination accommodations on students' examination experiences. Students who used assistive technology stated that they enjoyed higher autonomy and independence than those who wrote on their own and tested it, indicating that assistive technology-based accommodation can improve students' autonomy and independence in the examination process. While human writers are still a valuable accommodation, especially in situations where assistive technology is not available, in some cases, assistive technology may be more effective in supporting independent assessment. Another key focus of the study is on the need for accessible and inclusive assessment processes in higher education. Educating students with VI in examination environment that is more equitable is possible through the provision of appropriate assistive technologies, combined with sufficient training and technical support. Meanwhile, it is important that trained human writers are still employed to accommodate students who need this type of accommodation. Overall, the results advance the body of knowledge related to inclusive assessment by providing an example of the positive impact of examination accommodations for students with a visual impairment. Increased institutional policy strengthening and access to suitable accommodations can help to foster greater inclusion, independence, and equal opportunities in higher education.

Recommendation

- HEIs should provide better access to assistive technologies (e.g. screen readers, accessible devices) and ensure they are well-trained and supported in their use to help students with a visual impairment to become independent and confident.
- Universities should have a standardised training programme for the human writers to ensure accurate, neutral and verbatim transcription of examinations.
- Inclusive assessment practices should enable students to choose appropriate accommodations (assistive technology or human writers) with further accommodations (time, etc.) if necessary.
- Future research and institutional practices could further explore the use of AI tools for accessibility such as intelligent OCR, speech-to-text, and AI-powered assistive systems, aiming to enhance the accessibility, autonomy, and equitable assessment for students with visual impairment.

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