



Inclusive higher education in Latvia: challenges and solutions

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ABSTRACT

Higher education plays a crucial role in fostering economic growth and enhancing the general well-being of modern society. Nevertheless, a recent study conducted by Fernández-Batanero, Montenegro-Rueda, and Fernández-Cerero (2022) indicates that individuals with special needs still face various obstacles when they start their studies at university. For example, specific regulations of the Cabinet of Ministers of Latvia regarding adaptations and modifications in the learning process apply only to general education. Higher education in Latvia lacks openness for people with special needs, such as mobility impairments and specific learning difficulties. This is primarily due to the inaccessibility of the environment, the shortage of suitable teaching aids, and often the lack of expertise among academic staff in supporting individuals with special needs.

This study evaluates the accessibility of Latvian higher education institution websites. Its main tasks are to evaluate the accessibility of university websites based on WCAG and identify common accessibility challenges and impacted user groups.

Keywords: inclusive higher education, students with special needs, websites' accessibility, challenges and solutions of inclusive higher education in Latvia

Educación superior inclusiva en Letonia: retos y soluciones

RESUMEN

La educación superior desempeña un papel crucial en el fomento del crecimiento económico y la mejora del bienestar general de la sociedad moderna. Sin embargo, un estudio reciente realizado por Fernández-Batanero, Montenegro-Rueda y Fernández-Cerero (2022) indica que las personas con necesidades especiales siguen enfrentándose a diversos obstáculos cuando comienzan sus estudios universitarios. Por ejemplo, las normas específicas del Consejo de Ministros de Letonia relativas a las adaptaciones y modificaciones en el proceso de aprendizaje solo se aplican a la educación general. La educación superior en Letonia carece de apertura para las personas con necesidades especiales, como discapacidades motrices y dificultades específicas de aprendizaje. Esto se debe principalmente a la inaccesibilidad del entorno, la escasez de material didáctico adecuado y, a menudo, la falta de experiencia del personal académico en el apoyo a personas con necesidades especiales. Este estudio evalúa la accesibilidad de los sitios web de las instituciones de educación superior de Letonia. Sus principales tareas son evaluar la accesibilidad de los sitios web de las universidades basándose en las WCAG e identificar los retos comunes en materia de accesibilidad y los grupos de usuarios afectados.

Palabras clave: educación superior inclusiva, estudiantes con necesidades especiales, accesibilidad de los sitios web, retos y soluciones de la educación superior inclusiva en Letonia.

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Ensino superior inclusivo na Letónia: desafios e soluções

RESUMEN

O ensino superior desempenha um papel crucial na promoção do crescimento económico e na melhoria do bem-estar geral da sociedade moderna. No entanto, um estudo recente realizado por Fernández-Batanero, Montenegro-Rueda e Fernández-Cerero (2022) indica que os indivíduos com necessidades especiais ainda enfrentam vários obstáculos quando iniciam os seus estudos na universidade. Por exemplo, regulamentos específicos do Conselho de Ministros da Letónia relativos a adaptações e modificações no processo de aprendizagem aplicam-se apenas ao ensino geral. O ensino superior na Letónia carece de abertura para pessoas com necessidades especiais, tais como dificuldades de mobilidade e dificuldades específicas de aprendizagem. Isto deve-se principalmente à inacessibilidade do ambiente, à escassez de meios de ensino adequados e, muitas vezes, à falta de experiência do pessoal académico no apoio a indivíduos com necessidades especiais.

Este estudo avalia a acessibilidade de sites de instituições de ensino superior da Letónia. Suas principais tarefas são avaliar a acessibilidade de sites universitários com base no WCAG e identificar desafios comuns de acessibilidade e grupos de usuários impactados.

Palavras-chave: ensino superior inclusivo, estudantes com necessidades especiais, acessibilidade de sites, desafios e soluções do ensino superior inclusivo na Letónia

Introduction

In recent years, the significance of inclusive education has gained increasing global attention, underscoring the need for educational institutions to address the diverse needs of all students, including those with disabilities (Carballo et al., 2021; Villouta & Villarreal, 2022; Packer et al., 2024). Accessibility in physical and digital environments is essential for equal opportunities in higher education. In Latvia, this issue is particularly pressing, as nearly 213,000 people live with disabilities, 114,000 of whom are of working age, yet only 40% are employed (Dieziņa, 2024). The low employment rate among individuals with disabilities emphasises the role that education and accessible information play in increasing participation in the workforce. Balodis, leader of the “Apeirons” Society for Individuals with Disabilities and their Friends, stresses the importance of evaluating the accessibility of the environment, education, and social services (Dieziņa, 2024). Balodis suggests that not addressing these issues can impede conversations about job opportunities and diminish the motivation of those facing health challenges or lacking support systems to encourage them further. Accordingly, Latvian authorities aim to increase the employment rate of individuals with disabilities by up to 50%, as Dieziņa (2024) stated.

Although policy initiatives have increased the enrolment of students with disabilities in higher education institutions (Carballo et al., 2021; Villouta & Villarreal, 2022), numerous obstacles still hinder their academic success and inclusion into the labour market. Insufficient faculty training, inadequately adapted curricula, inaccessible teaching materials, and infrastructural barriers are frequently encountered by university students with special needs (Carballo et al., 2021).

In Latvia, the focus on inclusive higher education has only intensified recently. Despite inclusive education being introduced in general education as early as the late 1990s (Nīmante, 2008; Rozenfelde, 2014), higher education institutions have been relatively slow to adopt inclusive practices. Initial efforts to integrate inclusive activities into general education during the 2000s laid the groundwork for broader educational reforms. Inclusive education became a national priority in frameworks such as the *Educational Development Guidelines for 2014–2020*, emphasising quality and inclusive education for individual growth and sustainable national progress (Ministry of Education and Science, 2012). The updated guidelines for 2021–2027 continue to stress the need for targeted support systems and enhanced inclusive education strategies, particularly for students with special needs, minority

groups, returning citizens, and immigrants (Ministry of Education and Science, 2021). The Education Law of the Republic of Latvia (1999) also guarantees the right of every individual to a quality and inclusive education in Article 3.

The first extensive study on the accessibility of higher education for people with special needs in Latvia was conducted in 2016 by the Ombudsman of the Republic of Latvia in collaboration with the “Apeirons” Society for Individuals with Disabilities and their Friends. The research focused on implementing the right to education as stated in Article 24 of the UN Convention on the Rights of Persons with Disabilities, with a particular emphasis on access to higher education (Ombudsman of the Republic of Latvia, 2016). It identified various barriers that students with disabilities encounter related to higher education institutions’ physical and informational environments. The study provided effective strategies and recommendations for enhancing access, which were pivotal in assuring the successful inclusion of all students.

This research examines the current state of inclusive higher education in Latvia, motivated by the findings of the 2016 study and the need to evaluate progress since that time. Recent reports from the Ombudsman’s Office (2024) indicate that examined municipal and state websites lack full accessibility for individuals with disabilities, significantly restricting access to essential information (Ombudsman of the Republic of Latvia, 2024). The evaluation indicated several errors in integrating these websites into a unified platform that is compliant with accessibility standards. Authorities have slowly addressed reported accessibility issues, fostering these challenges (Ombudsman of the Republic of Latvia, 2024). The accessibility of higher education websites is a significant concern for academics, educational administrators, and policymakers globally (Daly et al., 2022; Gibson, 2023; Lopez, 2024). Worldwide investigation indicates that numerous higher education institutions fail to fully comply with accessibility standards or achieve partial compliance, resulting in considerable obstacles for prospective and current students with disabilities. (Al-Azawei, Serenelli, and Lundqvist, 2016). A recent risk management firm AAAtraq report indicates that 97% of U.S. universities lack websites that comply with accessibility standards, including the Web Content Accessibility Guidelines (WCAG) and the Americans with Disabilities Act (AAAtraq, 2022). Well-known institutions like Harvard University and UC Berkeley have encountered legal challenges regarding the inaccessibility of online content, especially the absence of transcripts, textual descriptions, and captions for multimedia (AAAtraq,

2022). Despite claims of a commitment to accessibility, these universities have had difficulties implementing sufficient measures. This study investigates how Latvian higher education institutions tackle the challenges of providing accessible information to promote inclusive education. This research primarily aims to determine the accessibility of websites created by higher education institutions in Latvia.

Objectives

This study aims to analyse the websites of Latvian higher education institutions regarding their accessibility, focusing on compliance with *Web Content Accessibility Guidelines (WCAG) 2.1 Level AA standards*. The following research questions were formulated to achieve the aim: How accessible are university websites according to the WCAG? What are the typical accessibility challenges found in university websites, and which groups with special needs are impacted the most by these barriers? How do the accessibility problems identified on Latvian higher education websites differ between the *UserWay* and *WAVE* evaluation tools?

Justification

Despite Latvia's significant progress in implementing inclusive education, there is insufficient understanding of how these policies are adopted in the online environments of higher education institutions. Specifically, the degree to which Latvian higher education institutions ensure the accessibility of their websites remains unclear. This is particularly concerning given that recent studies have revealed significant accessibility challenges on the websites of state and municipal government organisations, including educational institutions (Ombudsman of the Republic of Latvia, 2024).

These shortcomings present severe challenges for prospective and current students with special needs, restricting their access to essential information and hindering their full participation in academic life.

This study aims to address this gap by evaluating the accessibility of Latvian higher education institution websites, thereby assessing how well these institutions comply with international accessibility standards.

This research will compare the accessibility of these websites using *UserWay* and *WAVE* to understand better the issues faced by disabled students. It will also reveal which barriers affect special needs groups most, helping institutions adapt and create a more inclusive academic environment. Automated methods, such as *UserWay* and *WAVE*, to evaluate website accessibility limits this study. These technologies help identify WCAG 2.1 Level AA compliance, however they cannot detect all accessibility issues. Automated tools may overlook more nuanced issues like cognitive impairment accessibility, screen reader, and keyboard navigation efficacy. Automated tests cannot assess image alternative text, content clarity, or organisation for disabled users. Thus, while this study provides a complete overview of technical accessibility problems, it does not identify all accessibility issues that can only be found by human testing and user feedback. Thus, considering these tools' limitations, this research's findings should be considered.

Theoretical Foundations

Higher education institutions must address accessibility and inclusivity to meet the special needs of all students. Burgstahler

(2021) defines accessibility in higher education as enabling students with disabilities to learn, engage in academic activities, and interact like other students. This includes physical access and digital accessibility, which involves designing websites to help people with disabilities perceive, comprehend, navigate, and interact with content effectively (World Wide Web Consortium [W3C], 2023).

Academic achievement depends on a sense of community, especially for students with disabilities and others previously excluded by higher education. These groups need belonging. A solid sense of belonging boosts motivation and commitment to studies, leading to higher graduation rates among these groups, as Strayhorn (2019) and Vaccaro and Newman (2017) described.

One crucial factor is ensuring that all campus facilities are physically accessible to students with disabilities. Moreover, Moriña (2017), Packer, Abbinett, Pierce, & Smith (2024) highlight the significance of offering support during the transition into higher education, especially during the first year, to improve the retention and success of students with disabilities. Providing faculty with the training and skills needed to accommodate and support students with disabilities is also essential, as it promotes inclusive teaching practices and enhances educational outcomes (Lombardi, Murray, & Gerdes, 2011). In addition, educating typically abled peers about disability and inclusion fosters a more inclusive campus environment, encouraging positive social interactions (Fleming, Oertle, & Plotner, 2017).

According to Lazar (2022), universities can take proactive steps by ensuring that disability services are easily accessible on their websites, promoting support groups and diversity clubs, and demonstrating a commitment to accessibility through available tools, services, and events.

Creating accessible higher education environments depends on several fundamental components, including online programs (Burgstahler, 2022; Reyes, Meneses & Xavier, 2023). Research involving practitioners, students, and advocates has highlighted the critical need for information regarding resources and access to disability services to be easily and readily available. Rao and Meo (2016) support the implementation of Universal Design for Learning (UDL) principles, which emphasise the importance of offering various representation methods, engagement, and expression to address diverse learning requirements. Kumar and Wideman (2014) point out the necessity of establishing accessibility committees and governance policies to guarantee institutional responsibility and maintain a commitment to accessibility efforts.

Lombardi and Murray (2011) further suggest that regular training and engagement with faculty and student services staff are crucial to fostering a unified approach to accessibility and support for students with disabilities. To eliminate obstacles and guarantee that students receive the necessary accommodations, it is crucial to implement proactive outreach, facilitate communication between students and faculty, and provide staff training on inclusion for students with disabilities (Getzel & Thoma, 2008). Nevertheless, certain students with disabilities may not take advantage of these services because they are unaware of their availability or uncertain how to access them (Hong, 2015). Gierdowski, Brooks, and Galanek (2020) highlight the significance of ensuring that student accommodations are readily accessible and that disability services offices provide prompt responses, as they are frequently only available after students have registered.

Despite global progress, significant barriers to inclusion and accessibility persist in higher education. Moriña (2024) notes that the absence of clear policies and procedures around accessibility can result in inconsistent student support.

To address these barriers, institutions must prioritise creating educational environments that are welcoming to all students. The World Wide Web Consortium (2023) highlights the necessity of ensuring that individuals with disabilities can perceive, understand, navigate, and interact with websites and digital content. Accessible websites facilitate learning and provide critical information, as much of higher education communication and instruction now occurs online (Burgstahler, 2022). Those responsible for creating and managing web content must ensure it is accessible to all users (World Wide Web Consortium [W3C], 2023). In many cases, this is not merely a recommendation but a legal requirement mandating that digital content be accessible to individuals with disabilities.

Latvia's commitment to inclusion is reflected in its educational development guidelines for 2021–2027, which emphasise the creation of socially and emotionally safe, inclusive educational institutions (Ministry of Education and Science, 2020).

Equity and inclusion theories focus on creating equal educational opportunities by addressing systemic inequalities and implementing strategies that ensure all students, regardless of background or ability, are included (Rapp & Corral-Granados, 2021). These theoretical foundations highlight that accessibility and inclusiveness are essential to higher education's mission. By addressing physical, digital, and systemic barriers, universities can foster environments that support the academic success and well-being of students with disabilities.

Methodological Delimitation

This study used a quantitative research design to evaluate the accessibility of websites of higher education institutions in Latvia. The institutions were identified using data from the Latvian Higher Education Quality Agency's (AIKA) portal and statistics from the Central Statistical Bureau for 2023. Initially, 51 accredited higher education institutions were selected for the study; however, two were excluded due to liquidation or ongoing restructuring processes. As a result, the final sample comprised 49 publicly accessible websites, including 32 public and 17 private higher education institutions.

The study employed automated website testing (Alsaeedi, 2020) and used two web accessibility evaluation tools: *UserWay* (<https://userway.org/scanner/>) and *WAVE* (<https://wave.webaim.org/>). Both tools are designed to assess websites' adherence to the Web Content Accessibility Guidelines (WCAG) 2.1 Level AA, the globally recognised standard for web accessibility, established by the World Wide Web Consortium (W3C) (2023). When comparing web accessibility evaluation tools, it is essential to notice that both tools are widely acknowledged in the field and are trusted for their ability to identify significant accessibility concerns in higher education websites. (Alsaeedi, 2020).

UserWay and *WAVE* have been employed in various studies evaluating the accessibility of higher education websites. For instance, *WAVE* was used in a study by (Alsaeedi, 2020), which examined the accessibility of university websites, demonstrating its effectiveness in detecting common issues such as missing alternate text, contrast problems, and improper HTML element usage. According to a review by *Inclusive Sport Design* (2021), *UserWay* is highly regarded for its accessibility widget. *UserWay* evaluates and validates website code and content, pinpoints accessibility violations, and provides guidance for fixing them. These findings suggest that both tools are reliable for evaluating accessibility in educational environments, where a diverse user base, including students with disabilities, heavily relies on digital resources.

Automated testing involved scanning the selected websites to assess whether they meet WCAG 2.1 Level AA requirements. The evaluation focused on several critical factors: alternative image text, the appropriateness of colour contrast ratios, keyboard navigation functionality, and the availability and accessibility of error messages and form fields.

After completing the automated scanning, both tools generated detailed reports highlighting accessibility issues and non-compliance areas. To provide a comprehensive overview of each website's technical accessibility, the results from both *UserWay* and *WAVE* were combined for further analysis.

Results

In this study, *WAVE* generally identified more issues related to links and headings. Using both tools, a more comprehensive assessment of website accessibility was achieved, as they complement each other in detecting a broad range of issues.

A higher accessibility score indicates better compliance with WCAG 2.1 Level AA standards. The *UserWay* tool provides a percentage score, reflecting the overall accessibility of each website. An analysis of the accessibility scores from the 49 Latvian higher education institutions' websites revealed significant variations in compliance levels. The institutions were grouped into three score ranges to understand better these variations: 30-40%, 40-50%, and 50-60%. This grouping allowed for a more structured evaluation of their overall accessibility performance relative to WCAG 2.1 Level AA standards.

The results showed that most institutions scored within the 40-50% range, with fewer institutions achieving higher or lower scores. This distribution is visually represented in a bar chart (See Fig. 1), which illustrates the percentage of institutions in each score range and provides a clearer understanding of the general compliance levels across Latvian higher education institutions.

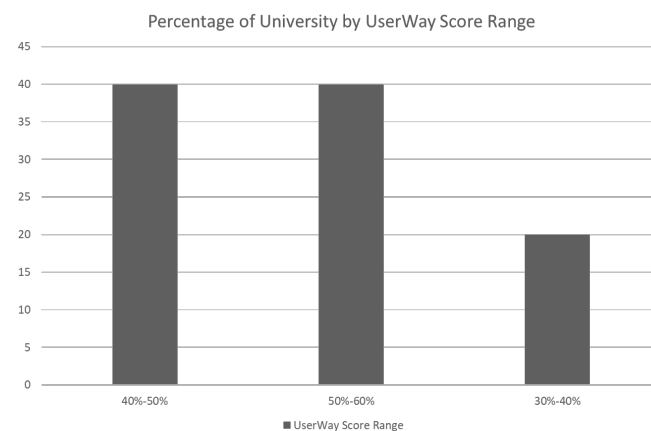


Figure 1. Percentage Distribution of Universities by UserWay Accessibility Score Ranges

The accessibility evaluation of 49 higher education institution websites in Latvia revealed significant variability in their compliance with Web Content Accessibility Guidelines (WCAG) 2.1 Level AA, based on assessments using *UserWay* and *WAVE* tools. Most institutions fall within the 40-50% range, indicating that most are moderately compliant with accessibility standards but still have considerable room for improvement. These institutions have likely implemented some basic accessibility features, such

as alternative text for images or simplified navigation. However, they continue to face challenges in areas such as contrast issues, form labeling, and multimedia accessibility, which hinder the whole usability of their websites for individuals with disabilities.

A smaller percentage of institutions scored between 50% and 60%, reflecting better accessibility performance. These higher-scoring institutions have made more progress in complying with WCAG guidelines, likely addressing critical issues such as proper image descriptions, improved contrast ratios, and enhanced support for screen readers and keyboard navigation. However, despite their relatively higher scores, these websites still do not fully meet accessibility standards and would benefit from further improvements to provide a more inclusive user experience.

Institutions with scores in the 30-40% range represent those with the most severe accessibility challenges. Websites in this group often lack fundamental accessibility features, such as alternative text for images, accessible navigation, and proper colour contrast. These institutions require urgent attention to improve their accessibility features, ensuring that users with disabilities can effectively access their websites and content.

The standard deviation of the *UserWay* scores across all institutions is approximately 8.11%, indicating a moderate level of variability in accessibility scores. This suggests that while most institutions cluster around the average score, there is still some dispersion in how well they comply with WCAG 2.1 Level AA standards. The mean accessibility score was 48.6%, reflecting that, on average, institutions have implemented about half of the recommended accessibility features. The scores ranged from 36% to 58%, indicating a relatively narrow range of accessibility levels among institutions, with no extreme outliers. This narrow range suggests that most institutions perform at similar levels, though significant improvements are needed to reach full compliance.

On average, *UserWay* detected 148.8 errors per institution, with a standard deviation of 97.3. The high standard deviation highlights significant variability in accessibility performance across different institutions, with some exhibiting far more accessibility issues than others. *UserWay's* error identification focuses on accessibility violations, including missing alternative text, improper form labels, inadequate contrast, and poorly structured navigation elements. The higher average error count compared to *WAVE* may result from *UserWay's* sensitivity in identifying a broader spectrum of issues. While some of these violations may not severely affect website usability, they still pose barriers for users with disabilities and reduce overall accessibility.

In contrast, *WAVE* detected an average of 36.4 errors per institution, with a standard deviation of 19.1, indicating less variability in the number of errors detected across institutions than *UserWay*. This suggests a more consistent pattern of accessibility issues across evaluated websites. *WAVE* primarily identifies critical technical violations, such as missing alternative text, empty links, and improper heading structures. Although *WAVE* detected fewer errors overall, the issues flagged by this tool are often directly related to severe usability challenges experienced by users with disabilities.

In addition to errors, *WAVE* identified an average of 81.6 alerts per institution, with a standard deviation of 50.6. Alerts indicate potential accessibility concerns that may not yet be full violations but could negatively impact the user experience. These alerts commonly highlight skipped heading levels, missing form labels, or redundant links. While these issues may not immediately turn off website functionality, they can complicate naviga-

tion for users relying on screen readers or keyboard navigation, making the overall experience less intuitive.

The comparative analysis of both tools indicates that *UserWay* tends to identify a broader array of accessibility issues, while *WAVE* focuses more on technical violations that directly affect usability. Both tools provide complementary insights, offering a comprehensive evaluation of website accessibility.

The results indicate that most Latvian higher education institutions are only moderately compliant with accessibility standards, with significant room for improvement. Institutions in the 30-40% score range face the most pressing accessibility challenges, while those in the 50-60% range demonstrate more robust compliance but still fall short of full accessibility. The combined use of *UserWay* and *WAVE* reveals a broad spectrum of accessibility issues, emphasising the need for ongoing efforts to enhance digital accessibility in higher education.

Contrast issues are a fundamental barrier to accessibility, particularly impacting users with low vision and colour blindness. These issues arise when the contrast between text and background is insufficient, making it challenging for users to read and interact with content effectively. This study employed two tools *UserWay* and *WAVE* to detect contrast-related errors across 49 institution websites. Both tools played a significant role in identifying areas where improvements are needed, though their performance in detecting these issues varied.

On average, *UserWay* detected 9.13 contrast errors per institution, while *WAVE* identified a significantly higher average of 34.33 contrast errors per institution. The highest number of contrast issues detected by *UserWay* at any institution was 36, while *WAVE* recorded as many as 97 contrast errors in some cases. These outliers represent websites with severe contrast issues, which pose substantial barriers to accessibility for users with visual impairments.

Notably, both tools detected zero contrast errors at certain institutions, indicating that these institutions have successfully addressed contrast-related accessibility issues. This suggests that some websites have implemented adequate solutions for visual accessibility, though ongoing attention to other accessibility aspects remains essential. The fact that *WAVE* detected significantly more contrast-related problems, especially in institutions with more pronounced accessibility challenges, indicates that this tool may be more effective in identifying nuanced or extensive contrast-related barriers that *UserWay* might not fully capture.

The disparity between the two tools underscores the importance of using multiple evaluation methods when assessing website accessibility. While *UserWay* provides valuable insights into general accessibility compliance, *WAVE* appears to be more thorough in detecting a broader range of contrast issues, particularly those that significantly affect usability for individuals with low vision or colour blindness.

This analysis highlights the need for ongoing improvements in contrast settings across websites to ensure full accessibility for all users, regardless of their visual abilities.

The accessibility evaluation of 49 higher education institution websites using *UserWay* reveals significant issues across various categories of special needs, including *blindness, deaf-blindness, mobility impairments, low vision, cognitive impairments, attention deficits, and colourblindness*. The results (See Fig. 2) show that many institutions face substantial barriers to offering an inclusive digital experience for individuals with disabilities. This finding underscores the importance of addressing these gaps to ensure that all students can fully engage with online educational resources, regardless of their abilities.

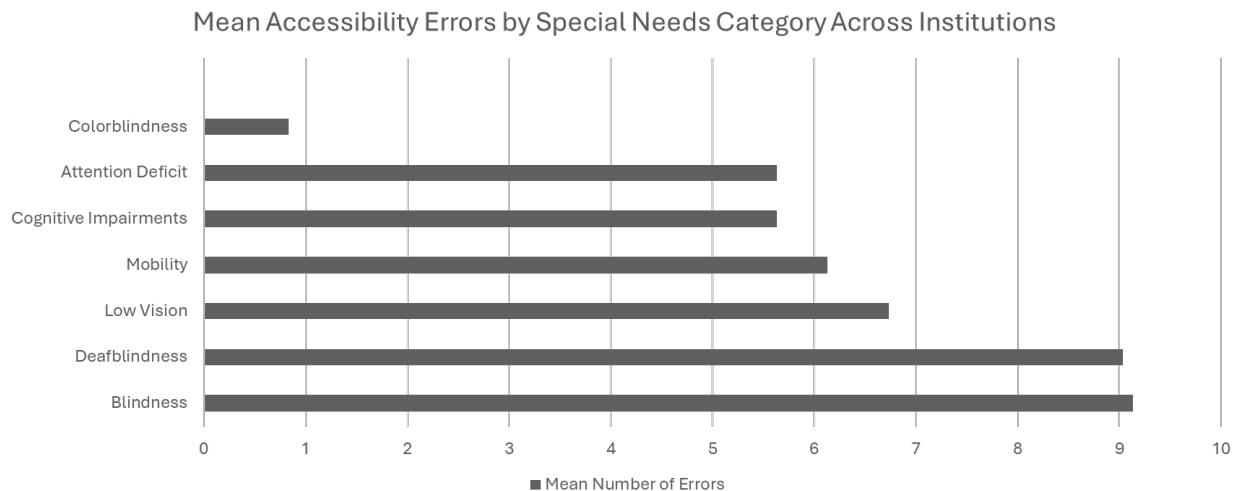


Figure 2. Mean Accessibility Errors by Special Needs Category Across Institutions

The bar chart highlights that blindness and deafblindness are the most problematic categories, with websites frequently failing to provide necessary accommodations for these user groups, averaging around nine errors per institution. The most common errors include missing alt text for images, poor form labeling, and inadequate screen reader compatibility. These issues create substantial barriers for users who rely on assistive technologies like screen readers or Braille displays to navigate and comprehend content. This suggests that institutions must improve screen reader compatibility significantly, add alt text to images, and ensure that form fields are correctly labeled to enhance accessibility for blind and deafblind users.

Mobility and low vision issues also present considerable challenges, as many websites need to fully support keyboard navigation or provide adequate contrast between text and background. Mobility-impaired users encounter an average of 6.73 errors per institution, while low-vision users face 6.13 errors on average. These problems frequently lead to diminished readability and poor user experience. This could be resolved by consistently following WCAG (Web Content Accessibility Guidelines) standards and adopting improved website design principles.

For users with cognitive impairments and attention deficits, many websites lack simple structures and clear language, essential for easing navigation and reducing cognitive load. Both categories averaged 5.63 errors per institution, indicating moderate challenges for users with these disabilities. More complex website structures, difficult navigation, or unclear language can overwhelm users, making it difficult for them to engage effectively with content. Simplifying the design and ensuring a logical flow of information would improve accessibility for these users.

Colourblind users face the fewest errors, with a mean of 0.83 errors per institution, indicating that most websites rely less on colour to convey critical information. However, even a few errors can negatively impact users who rely on colour contrast and distinct visual cues. Improvements can be made by ensuring that information is not conveyed solely through colour.

Overall, the bar chart demonstrates that higher education institutions display varying levels of accessibility across different special needs categories. Blind, deafblind, and mobility-impaired users face the most significant barriers, highlighting

considerable room for improvement in making these websites fully inclusive. Addressing the issues in each category will require targeted efforts to enhance website navigation, readability, and content clarity, ensuring a more accessible experience for all users.

Conclusions

Evaluating Latvian higher education websites has revealed considerable accessibility challenges that impede users with disabilities from fully engaging with digital content. While some institutions have made progress in implementing basic accessibility features, overall compliance with Web Content Accessibility Guidelines (WCAG) 2.1 Level AA remains insufficient. Most institutions fall within the 40-50% compliance range, as assessed by the *UserWay* tool, indicating moderate compliance but substantial barriers, particularly in areas crucial for users with disabilities, such as screen reader compatibility, contrast issues, and proper form labeling.

The institutions displayed varying performance levels, with some excelling in creating accessible digital content while others exhibiting significant shortages. They often need help with missing alt text, poorly labeled forms, and insufficient screen reader support, which severely limits their ability to navigate websites.

Users with low vision and colourblindness encounter numerous contrast-related errors, particularly in institutions that do not meet adequate contrast ratio standards. The *WAVE* tool detected substantially more contrast issues than *UserWay*, suggesting this is a widespread problem across many institutions. Mobility-impaired users often face difficulties with poor keyboard navigation, as many websites do not fully support browsing without a mouse, which is essential for users relying on assistive devices.

In addition, users with cognitive impairments and attention deficit issues frequently struggle with websites that present complex structures and unclear language. Simplifying content and creating a more logical information flow is critical to making websites more accessible and user-friendly for these groups. These findings emphasise the need for higher education institutions to address various accessibility challenges and create more inclusive digital environments.

Recommendations

Higher education institutions must:

- improve their websites' compatibility with screen readers by providing descriptive alt text for all images, accurately labelling form fields, and ensuring the general content structure is accessible to people using assistive technologies.
- focus on resolving contrast issues to enhance readability for individuals with limited vision. Adhering to WCAG-compliant colour contrast ratios will significantly improve digital content accessibility to people with visual impairments.
- ensure that all interactive components, including links and form fields, are accessible by keyboard, which is essential for people with mobility limitations.
- improve their website architectures and reduce cognitive stress, allowing engagement with content for people with cognitive impairments.
- offer continuous training for web developers, faculty, and staff to ensure comprehension of accessibility's significance and the proper implementation of features. Consistent training will facilitate ongoing adherence to WCAG standards. To detect and fix emerging issues, regular accessibility audits employing various technologies, including *UserWay* and *WAVE*, must be performed.
- proactively obtain feedback from people with special needs to identify challenges that automated systems may overlook. Focus groups and user testing with people with special needs can provide essential information for enhancing website accessibility and overall user experience.

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