



Enhancing Accessibility and Resilience in Distance Education: Insights from Higher Education

Verena Karlsdóttir

University Of Akureyri, Iceland

Abstract

The COVID-19 pandemic significantly transformed higher education, accelerating the shift to distance education and making it an increasingly attractive option for students worldwide. As universities adapt to this evolving educational landscape, understanding why students choose distance education, their preferred teaching methods, and the challenges they face is fundamental. This study examines these factors among students at a small university in Iceland, offering insights into how institutions can enhance the accessibility and resilience of distance education.

An online survey conducted in 2024 gathered data on students' academic needs, engagement with course materials, and perceptions of assessment methods and digital learning environments. The findings highlight the vital role of flexibility, particularly for students balancing work and family responsibilities, which emerged as the dominant factor in respondents' choice of distance education. Subgroup differences were analysed using non-parametric tests with false discovery rate adjustment; after correction, demographic differences were limited, with employment status showing the most robust association (working students emphasised career advancement more strongly as a reason for choosing distance education). While the learning management system and recorded lectures were well received, students identified technological improvements, particularly in the audio and video quality of lectures, as areas for improvement.

Students expressed a strong preference for continuous assessment over traditional exams, advocating for assignments that reflect real-world problems. Additionally, concerns were raised about mandatory in-person attendance requirements. These insights emphasize the need for universities to continuously refine their teaching methods, digital tools, and support systems to ensure that distance education remains inclusive, effective, and adaptable to students' diverse needs.

Keywords: distance education; higher education; distance learning; flexibility; remote learning

1. Introduction

At the beginning of 2020, higher education institutions across the globe faced a sudden and unprecedented challenge: how to deliver quality education during a period of restricted physical meetings due to the COVID-19 pandemic. Teachers who had previously relied

exclusively on face-to-face instruction were suddenly required to adopt technologies and teaching methods previously reserved for distance learning environments. As a result, distance education gained footing as a legitimate and viable option for students (Carlton, 2024).

Understanding the needs and preferences of distance learners is essential for improving their academic experience and promoting successful learning outcomes (Aristovnik et al., 2023; Ericson Nolasco, 2022; Selvaraj et al., 2021). Furthermore, pedagogical strategies in distance education must be continually developed to meet evolving expectations. Research into this mode of learning not only informs institutional development but also shapes education policies that serve students in both rural and urban environments (Geirsdóttir et al., 2007). Investigating technical infrastructure, content delivery, and student needs, especially across cultural and demographic lines, is necessary to improve both access and quality (Šmeringaiová, 2021).

Despite its benefits, distance education is complex and demanding. To support student engagement and success, educators must foster meaningful interaction and design instruction that aligns with students' varied circumstances. The present study seeks to examine why students opt for distance education, what teaching methods and tools they find most effective, and what challenges they encounter in this learning mode.

2. Literature: Framing Distance Education

The transition to online learning during the pandemic forced many institutions to adopt new practices. Technological developments have drastically reshaped teaching and learning, including how university campuses are used and how instruction is delivered. Importantly, post-pandemic higher education has not simply “returned to normal”; many institutions have continued to use hybrid and digital elements and have likewise shifted from emergency solutions to more intentional, quality-assured online and blended design (Pelletier et al., 2024). This makes student expectations around flexibility, digital quality, and support central to both accessibility and educational resilience.

In this article, distance learning is defined as “any kind of remote learning in which the student is not physically present in the classroom” (Ericson Nolasco, 2022). A related distinction is between emergency remote teaching (ERT) and planned online learning: ERT was a rapid crisis response during the pandemic, whereas effective distance education requires careful pedagogy, support structures, and appropriate assessment design (Hodges et al., 2020).

Platforms such as Zoom and Microsoft Teams are widely used to facilitate real-time communication, enabling students to stay in touch with teachers and peers regardless of location. These real-time interactions are essential for sustaining engagement and providing timely feedback. Additional tools, such as YouTube and podcasts, enhance the learning experience by enabling the flexible distribution of course content (Guo, Kim & Rubin, 2014). Social media platforms like Facebook and LinkedIn also contribute to academic dialogue and resource sharing, promoting a sense of community among distance learners (Tess, 2013). Cloud services such as Google Drive, Dropbox, and OneDrive further support group collaboration and information sharing (Higgins, 2016). Post-pandemic implementations also highlight “hybrid-flexible” delivery as one strategy to increase access. Still, the literature emphasises that equality of experience depends strongly on audio and/or video quality and in-classroom sound quality, exactly the practical concerns students often notice first (Detyna et al., 2023).

Distance education has also inspired pedagogical innovation. Traditional teaching models are being re-evaluated, and interactive methods such as the flipped classroom, where students study content independently before engaging in collaborative activities, are gaining popularity (Bergmann & Sams, 2012). Flexibility, a hallmark of online education, allows students to learn at their own pace and on their own schedule (Moore & Kearsley, 1996).

Distance learning enhances access, accommodates diverse learner needs, and supports lifelong learning. For many, particularly women, it offers a more satisfying educational experience (González-Gómez et al., 2012). However, it also poses challenges. Not all students have equal access to the necessary technology or internet connectivity (Van Dijk, 2005). Equity and access debates have increased post-pandemic: digital needs involve not only connectivity but also access to suitable devices and study spaces, and they overlap with cost-of-living pressures and paid work. Extensive student surveys continue to show that a substantial minority of students experience learning problems due to a lack of suitable devices, underlining that “digital access” cannot be assumed, even in developed systems (Jisc data analytics, 2024). Moreover, the lack of immediate feedback and face-to-face interaction can inhibit understanding and reduce engagement. What is more, distance learners must use high levels of self-discipline and motivation (Hodges et al., 2020). Without structured schedules, students assume greater responsibility for managing their own learning (Broadbent & Poon, 2015). Social isolation is another concern, with potential impacts on students’ mental health (Rovai & Wighting, 2005). Adult learners and those balancing employment are particularly at risk of dropout (Araque et al., 2009; Jia & Maloney, 2015). Financial pressures and time constraints often worsen these risks (Montmarquette et al., 2001; Darolia, 2013).

Despite these obstacles, older students often demonstrate a strong ability to integrate learning with work experience. Satisfaction levels among distance learners are frequently comparable to those of on-campus students (Kahu et al., 2013). Distance education also enables institutions to reduce facility costs, though it requires substantial investment in technology and support systems to maintain instructional quality (Bryan et al., 2018). Effective implementation of educational technology depends on thoughtful integration into pedagogical goals and teacher training (Koehler & Mishra, 2009). Emerging technologies, including AI and virtual reality (VR), hold promise for creating personalized and immersive learning environments (Luckin et al., 2016; Radianti et al., 2020). Gamification, or the use of game-based elements, is another trend that can increase motivation and engagement (Deterding et al., 2011).

Assessment has become a particularly dynamic post-pandemic debate in higher education. There is growing emphasis on authentic and continuous evaluation (e.g., projects, applied case studies, and iterative submissions) as methods that can support learning, employability, and equality for diverse student groups (Vlachopoulos & Makri, 2024). At the same time, the fast development of generative AI has intensified concerns about academic integrity and increased calls to redesign assessment toward formats that are meaningful, contextualised, and transparent rather than relying primarily on traditional unseen exams (Amrane-Cooper et al., 2024).

Taken together, the post-pandemic literature suggests that distance education quality and equity depend less on any single platform and more on flexibility with clear structure, reliable digital delivery (especially audio/video), inclusive access to devices and support, and assessment approaches that reduce unnecessary logistical load while conserving academic standards. These themes align closely with the present study’s focus on students’ reasons for choosing distance education, preferred teaching methods and tools, and perceived challenges.

2.1 Distance Education in the Icelandic Context

In recent decades, Iceland has made notable efforts to expand and decentralize access to higher education, particularly through regional development and distance learning. A key milestone in this process was the founding of the University of Akureyri (UNAK) in 1987. Established with just four staff members and 31 students, UNAK initially focused on nursing and industrial management (Háskólinn á Akureyri, n.d.) but soon broadened its scope to include teacher education, fisheries management, and other fields that aligned with regional needs.

Distance education has long been a tool for overcoming Iceland's geographic challenges. As early as 1993, the Iceland University of Education (now part of the University of Iceland) began offering remote teacher training to address a shortage of qualified teachers in rural areas. By 2018, over half the students in the School of Education identified as distance learners (Árnason et al., 2021). UNAK joined this movement in 1998, when nursing students began participating in lectures via videoconferencing from remote locations. Since then, the university has expanded its flexible learning model, emphasizing the ability to study from any location rather than following fixed schedules (Háskólinn á Akureyri, n.d.). This national and institutional path makes Iceland a suitable post-pandemic case: flexibility is not only a pedagogical preference but also a long-standing access strategy in a sparsely populated country with substantial travel time and weather-related constraints between different locations.

While early efforts focused on increasing access, national policy did not always anticipate future developments. A governmental working group on rural distance education published a report in the early 2000s that emphasized the role of lifelong learning centers and suggested the creation of a national online university (Menntamálaráðuneytið, 2005). However, it failed to fully anticipate how quickly technology would advance, enabling universities to offer more dynamic and accessible programs. Around the same time, Bifröst University launched a distance-based business program and later evolved into a fully distance-learning institution with mandatory in-person sessions (Háskólinn á Bifröst, n.d.). Such mandatory in-person components remain a key equity issue in Icelandic distance education because they shift costs (travel, accommodation, time off work, childcare) onto students, an issue that directly re-emerges in the present study's findings and open-ended comments of students.

UNAK was at the forefront of this transformation and today offers a wide array of programs, including psychology, biotechnology, law, business, education, and police science. In 2019, the university received full accreditation to award degrees at all academic levels, including doctoral studies.

UNAK's approach is rooted in flexibility and student-centeredness. Courses are delivered through a combination of synchronous tools (e.g., Zoom, Teams, telepresence robots) and asynchronous formats (e.g., recorded lectures, email, learning platforms). On-campus study sessions ("lota") are held one to three times per semester, focusing on assignments, group work, and practical training, e.g., in nursing. Exams can be taken at UNAK, regional learning centers, or certified institutions abroad (Háskólinn á Akureyri, n.d.). From an equity and access perspective, these organisational features create a "mixed burden": the model enables participation across Iceland, but it can also introduce recurring logistical and financial costs when physical attendance or exam-centre requirements are extensive, echoing students' requests in this study for fewer mandatory in-person sessions and more flexible assessment arrangements.

However, research has shown that access alone is not enough to ensure success. Björnsdóttir (2012) found that while students appreciated the flexibility of recorded lectures, social interaction between distance and on-campus students remained limited. Other studies highlight differences between the two groups: distance learners tend to be older, work more, and come from families with lower levels of formal education (Jóhannsdóttir & Björnsdóttir, 2018), and they often take longer to complete their degrees (Björnsdóttir & Jóhannsdóttir, 2020). These findings emphasize that remote learners face distinct challenges. Björnsdóttir and Jóhannsdóttir (2022) argue that merely offering remote programs is insufficient; students also need robust academic and technological support. This aligns with feedback from UNAK students, who have called for more diverse teaching strategies and better integration of new digital tools (Háskólinn á Akureyri, 2023). As Árnason et al. (2021) note, effective distance education

depends on access to modern infrastructure and up-to-date technologies. The present study builds on this Icelandic evidence base by updating student needs in 2024 (post-pandemic), and linking those needs directly to actionable design areas such as assessment, digital delivery quality (especially audio/video), teacher responsiveness, and attendance/study-session policy, where equity and access are practically “felt” by students.

Against this backdrop, the present study explored three central questions:

- What motivates students to choose distance education at the university level?
- Which teaching methods, delivery formats, and assessment tools are most effective from the learners’ perspective?
- What are the main challenges distance learners encounter?

3. Methods

3.1 Research Design

Recognizing the diversity among distance learners with varying needs across departments, age groups, and life circumstances, the study adopted a convergent mixed-methods survey design combining quantitative and qualitative data (Bozkurt & Sharma, 2020; Zawacki-Richter & Buntins, 2019).

In early 2024, a digital survey was distributed via email to all enrolled students at UNAK (approx. 2,700). A total of 177 students opened and completed the survey, yielding a response rate of 6.5%. The number of responses to the open-ended questions was 109 and 101, respectively. Because several items were optional, the valid *n* varies across variables; we report item-level *n* in tables and use available-case analyses. Despite the low participation rate, likely due to time constraints, lack of interest, or general survey fatigue (Porter et al., 2004), the responses provide valuable insight into the experiences and expectations of the university’s distance learners. Given the low response rate, nonresponse bias cannot be ruled out. To assess representativeness, we compared the sample profile with the most recent publicly available UNAK enrolment aggregates as of 15 October 2024 for gender and study level (Háskólinn á Akureyri, 2024). We summarise these comparisons in Appendix A. Overall, the comparison indicates that the sample is slightly more female than the institutional benchmark and noticeably more postgraduate. This pattern is consistent with the likelihood that students with stronger engagement and/or greater study-related demands may be more leaned to respond. Consequently, results are reported and interpreted as indicative patterns rather than population estimates.

3.2 Participants

Participants were predominantly female (85%, gender item *n* = 141), with 56% aged 31 or older (age item *n* = 141). This gender distribution closely reflects the university’s overall student population, where most students are female due to high enrolment in fields such as education, nursing, psychology, and other social sciences. Approximately 68% were in relationships, and 53% reported having at least one child (parental-status item *n* = 143). Most respondents were also employed while studying: over half worked more than 31 hours per week. Participants represented a range of academic departments, with the most significant proportions enrolled in the School of Education (38.3%) and the School of Business (21.3%). Compared with UNAK aggregate enrolment statistics, the sample’s gender composition is broadly similar, whereas postgraduate/doctoral students are overrepresented (Appendix A). See also Table 1 for detailed demographics, which report valid percentages for each variable.

Table 1: Participants' Profile

Variable	N	%
Female	120	85.1 %
Male	20	14.2 %
Other	1	0.7 %
Children	142	53%
No children	67	46.9 %
Younger than 20 years	2	1.4 %
20-25 years	33	23.4 %
26-30 years	27	19.1 %
31-35 years	35	24.8 %
36 years or older	44	31.2 %
Undergraduate	96	68.1 %
Graduate	45	31.9 %
I do not work	17	12.0 %
1-9 hrs.	6	4.2 %
10-20 hrs.	19	13.4 %
21-30 hrs.	25	17.6 %
31 - 40 hrs.	49	34.5 %
More than 40 hrs.	26	18.3 %

3.3 Survey Instrument and Data Analysis

To strengthen the survey's reliability and validity, several steps were taken. The instrument was based on established surveys used in prior research, particularly on distance education during the COVID-19 pandemic (e.g., Fidalgo et al., 2020; Neroni et al., 2019; Petillion & McNeil, 2020; Selvaraj et al., 2021; Sindiani et al., 2020).

Key survey sections included:

- Reasons for choosing distance education
- Preferred learning methods

- Use of digital tools and platforms
- Assessment preferences
- Perceptions of the distance learning environment and study conditions

A pre-test of the questionnaire was conducted with teaching staff, students, and representatives from UNAK's Teaching Centre to ensure clarity and appropriateness of the questions. Feedback from this pilot led to revisions that improved face validity and eliminated ambiguities. The National Research Ethics Committee in Iceland granted ethical approval. While the use of self-reported data can introduce some response bias, anonymity and voluntary participation were emphasized to reduce social desirability effects.

Closed-ended items used 5-point Likert-type scales; lower mean scores indicate stronger agreement/greater perceived usefulness (as specified in each table). Descriptive statistics were used to assess overall trends. Because the quantitative outcomes were single-item 5-point Likert responses, subgroup differences were analysed primarily using the non-parametric test Mann-Whitney U. Response options "Ekki notað"/"Á ekki við" were treated as missing and excluded from inferential analyses. Effect sizes for Mann-Whitney U tests are reported as rank-biserial correlations (r_{rb}), where larger absolute values indicate stronger group separation. Full results are provided in Appendix B. Given the exploratory nature of subgroup comparisons across multiple items, p-values are interpreted cautiously and complemented by effect sizes and qualitative triangulation. A p -value of $<.05$ was considered statistically significant. Quantitative data were analysed using SPSS 26 and Excel.

Because multiple subgroup tests were conducted across sets of related single-item Likert outcomes, we controlled for multiple comparisons using the Benjamini–Hochberg false discovery rate (FDR) procedure. Adjustments were applied within families defined by survey block (reasons, learning methods, tools/platforms, assessment formats, learning environment) and by demographic comparison (gender, age group, employment status, parental status). We report both unadjusted p-values and FDR-adjusted q-values and interpret findings as statistically significant only when $q < .05$.

In addition to the structured questions, the survey included two open-ended items that invited students to suggest improvements to the university's distance education. These qualitative responses were analysed using thematic analysis (Braun & Clarke, 2006, 2012), resulting in six main themes: assessment, teaching practices, technology, attendance and study sessions, instructor engagement, and learning environment. The integration of quantitative and qualitative data enabled triangulation, thereby enhancing the overall trustworthiness of the findings.

4. Findings: Student Perceptions and Preferences

4.1 Motivations for choosing Distance Education

Students were asked to indicate their reasons for choosing distance education. As shown in Table 2, the most strongly endorsed factor was flexibility in managing one's own time, with an average score of 1.46 (on a 5-point Likert scale, where 1 = Strongly Agree). This was followed by improved time management (1.67) and accessibility due to living circumstances (1.82). Other relevant factors included technological advancements (2.07) and career development opportunities (2.31). Interestingly, COVID-19-related health concerns ranked lowest (3.21), suggesting that pandemic-related motivations were no longer central in 2024. In summary, internal motivations such as schedule autonomy outweighed external or health-related reasons in students' decisions to pursue distance education.

Table 2: Reasons why students choose distance education

	N	Mean	SD
Flexibility	175	1,46	0,72
Better time management (Work-life Balance)	175	1,67	0,90
Living situation/ Accessibility	162	1,82	1,19
Technology integration	171	2,07	1,04
Career advancement	168	2,31	1,03
No commute time (e.g., to the university)	163	2,44	1,24
Diverse course offerings	171	2,48	1,09
Cost savings	167	2,55	1,26
Better/higher academic achievement	173	2,69	1,14
Global pandemic impact/health considerations	150	3,21	1,21

4.2 Preferred Learning Methods and Tools

Students were asked to rate the usefulness of different learning approaches (Table 3). The most appreciated method was recorded video lectures by teachers (1.69), followed by guest lectures (2.02) and field trips or company visits (2.04). Least popular were games and role-play exercises (2.90), which students saw as less valuable or relevant.

Table 3: Learning methods or approaches

	N	Mean	SD
Video lectures (by teachers)	167	1,69	0,78
Guest lectures	163	2,02	0,82
Field trips/Company visits	125	2,04	0,94
Discussion sessions	163	2,20	1,00
Online quizzes	134	2,22	0,99
Shorter (research) articles	165	2,30	0,85
Podcasts	142	2,37	0,98
Use of virtual reality	78	2,56	0,79
Discussion forums	158	2,74	1,20
Textbooks	168	2,81	1,02
Games/Role-playing games	125	2,90	1,25

Among the digital tools used in teaching, the learning platform Canvas received the highest approval rating, with a mean score of 1.61 (Table 4). Zoom followed at 1.97, while Panopto, a video platform, received a moderate rating of 2.11. Tools like Canvas Studio scored lowest (2.65), with students commenting that it was less user-friendly and less functional than other platforms. Students suggested improvements in audio/video quality, better integration between platforms (e.g., Canvas and Uglu), and more intuitive navigation across systems.

Table 4: Tools/Software used in learning and teaching

	N	Mean	SD
Canvas	163	1,61	0,62
Zoom	159	1,97	0,86
Panopto	159	2,11	0,98
Quizzes, e.g., Kahoot, Quizizz, Mentimeter	80	2,11	0,89
Youtube	110	2,24	0,77
Padlet	88	2,32	1,09
Microsoft Teams	135	2,36	1,09
Inspera	142	2,45	0,95
Canvas Studio	83	2,65	0,99

Students showed a clear preference for individual assignments (1.57) and frequent low-stakes quizzes (1.86), indicating support for continuous assessment. In contrast, final written exams (3.48) and oral exams (3.44) were the least favoured (Table 5). These were perceived as stressful and less reflective of real-world skills. Students called for a greater emphasis on authentic assessment, such as project work, practical tasks, and smaller evaluations spread throughout the semester.

Table 5: Assessment methods

	N	Mean	SD
Individual assignments	163	1,57	0,61
Smaller quizzes or tests, such as multiple choice	158	1,86	0,98
Practical experiments/laboratory classes/	101	1,99	0,95
Case studies	121	2,12	0,78
Diaries/reflective journals	113	2,42	1,10
Taking part in discussions	157	2,46	1,09

Group work	162	2,73	1,31
Oral presentations	142	2,82	1,12
Oral examinations	98	3,44	1,24
Written exam at the end of the semester	155	3,48	1,31

4.3 Demographic Differences

To better understand how student characteristics shape experiences with distance education, the study examined variations in preferences and attitudes based on gender, age, employment status, and parental status. Subgroup comparisons were conducted using Mann-Whitney U tests because all outcomes are single-item Likert responses. Lower scores indicate more positive evaluations (stronger agreement/higher perceived effectiveness/higher satisfaction), depending on the item block. “Not used/does not apply” responses were excluded from these analyses. Given the number of item-level comparisons, statistical significance was evaluated using Benjamini–Hochberg FDR-adjusted q -values ($q < .05$) within each survey block and each demographic comparison. Raw p -values are reported for transparency, but results are interpreted as statistically significant only when they remain significant after FDR adjustment.

Overall, only one subgroup difference remained statistically significant after FDR adjustment: working students endorsed career advancement as a more important reason for choosing distance education than non-working students ($U = 1844$, $p < .001$, $q = 0.002$, $|r_{rb}| = 0.47$; median = 2 for working vs 3 for non-working; valid $n = 114$ vs 22). All other item-level differences reported below should be interpreted as exploratory patterns (raw $p < .05$ but $q \geq .05$) and considered alongside effect sizes and the broader pattern of results.

Gender differences were generally limited. A difference was observed for online quizzes as a learning method (women rated it more positively than men: median 2 vs 3; $U = 377$; $p = .032$; $|r_{rb}| = .36$), but it did not remain significant after FDR adjustment ($q = .347$). Because the number of men with valid responses was small (many selected “not used”), this pattern should be treated cautiously.

Several age-related differences emerged at the raw p -value level. Older students (≥ 31 years) evaluated Microsoft Teams more positively than younger students (≤ 30 years) ($U = 1947$; $p = .035$; $|r_{rb}| = .22$), but this did not remain significant after FDR adjustment ($q = .111$). Older students also rated short research articles more positively ($U = 2918$; $p = .006$; $|r_{rb}| = .24$) and recognised career advancement as a reason more strongly ($U = 2786.5$; $p = .012$; $|r_{rb}| = .24$), yet these did not remain significant after FDR adjustment ($q = .069$ and $q = .116$, respectively). Younger students evaluated quiz tools (e.g., Kahoot/Quizizz/Mentimeter) somewhat more positively ($U = 417.5$; $p = .037$; $|r_{rb}| = .28$), but this again did not remain significant after FDR adjustment ($q = .111$). Taken together, these are best read as cautious patterns rather than confirmatory subgroup differences.

Employment status showed the most transparent and consistent pattern. Working students endorsed career advancement much more strongly than non-working students ($U = 1844$; $p < .001$; $q = .002$; $|r_{rb}| = .47$). Other differences, reduced travel time ($U = 1525$; $p = .013$; $|r_{rb}| = .33$), time management/work–life balance ($U = 1699$; $p = .034$; $|r_{rb}| = .25$), and better

learning outcomes ($U = 1671.5$; $p = .048$; $|r_{rb}| = .25$), did not remain statistically significant after FDR adjustment ($q = .066, .104$, and $.104$, respectively), but they point in a coherent direction: work commitments appear linked to stronger preferences for time efficiency, reduced travel burden, and perceived career relevance.

Parents varied from non-parents on several motivations and one assessment preference at the raw p -value level. Parents were less satisfied with a written final exam (median 4 vs 3; $U = 1744$; $p = .009$; $|r_{rb}| = .25$), but this did not remain significant after FDR adjustment ($q = .087$). Parents also endorsed living circumstances/accessibility ($U = 2640.5$; $p = .020$; $|r_{rb}| = .21$), technological advancements ($U = 2904$; $p = .024$; $|r_{rb}| = .21$), better learning outcomes ($U = 3005.5$; $p = .015$; $|r_{rb}| = .23$), and career advancement ($U = 2856.5$; $p = .018$; $|r_{rb}| = .22$) more strongly; however, these did not remain significant after FDR adjustment (q values $\approx .061$ – $.199$ depending on the item family). These results, therefore, suggest (rather than confirm) that family-related constraints may increase the salience of accessibility and perceived efficiency benefits of distance education.

In summary, after controlling for multiple comparisons, only the employment-related difference in “career advancement” remained statistically robust. The remaining subgroup patterns are reported as exploratory signals that may inform hypotheses for future, adequately powered multi-institution studies.

4.4. Challenges identified by Distance Learners: Insights from open-ended Questions

To complement the quantitative results, students were asked two open-ended questions: *What aspects do you believe could improve distance education?* And *how could UNAK enhance its learning environment and teaching methods?*

After thematic analysis (Braun & Clarke, 2006, 2012), six main themes emerged: assessment, teaching/teaching methods, technology, on-campus sessions/attendance, teachers, and the learning environment, which are explained in detail below.

Assessment

The findings suggest reconsidering various aspects of assessment and instructional design to better meet students’ needs in a motivating and effective way. While group assignments can be valuable, students noted challenges in coordinating schedules and levels of commitment among group members. As one student remarked, *“I chose distance education because I prefer working independently. Distance learning should support the ability to study autonomously and take responsibility for one’s own success.”*

Students proposed replacing large final exams with smaller, continuous assessments distributed throughout the semester. This would reduce stress and improve time management. Such an approach could support long-term learning by enabling students to build knowledge and skills gradually. Flexibility in deadlines and exam scheduling was also emphasized.

Relevance to real-world contexts was another key issue. One participant commented: *“There is too much focus on textbooks and too little on real-world tasks. I want to be as prepared for the job market as possible, and relying too much on the textbook doesn’t help with that.”*

Students also expressed a desire for greater transparency and dialogue around assessment. Many questioned the relevance and fairness of traditional final exams, especially given the financial burden they impose on students living far from campus. As one respondent shared: *“Exam centers in the capital area charge 5,000 ISK [about 35 Euros] per exam. If you have*

several exams per course, the costs quickly add up. Just attending my exams during the first year cost me 60,000 ISK [about 400 Euros]. I expected extra expenses related to study periods, like travel, accommodation, and time off work, but I didn't expect to pay tens of thousands just to finish my courses. The university should consider partnerships to reduce this burden."

These insights point to the importance of rethinking assessment strategies to better align with modern learning and work environments. Open dialogue between faculty and students about assessment expectations and instructional approaches can also foster shared responsibility and continuous improvement.

Teaching Methods

Students emphasized the value of concise and focused lectures for maintaining attention and deepening understanding. Shorter lecture segments were seen as more efficient and better suited to independent learning. One student noted: *"Panopto lectures should be capped at one hour. It's difficult to get through longer recordings. I'd prefer shorter and more frequent lectures rather than a few very long ones."*

Students also called for more practical learning experiences, such as fieldwork, internships, and guest lectures from professionals. These elements help bridge academic content with workplace realities and provide applied knowledge. Active learning strategies, including regular discussions, mini-lectures, and short quizzes, were found to be helpful in promoting engagement and supporting diverse learning styles. Some students also requested more live sessions via Zoom or Teams, and fewer pre-recorded lectures.

Engaging students in course discussions, group tasks, and curriculum-related decisions was seen as critical for fostering motivation. Participatory learning approaches allow students to shape the learning process and develop stronger connections to their studies.

Technology

Students expressed a strong preference for all lectures and discussion sessions to be recorded and made available – ideally in advance. As one student wrote: *"It would be helpful to access lecture recordings a few days before class. Many teachers reuse old recordings anyway so that they can post them earlier."*

Audio quality was a recurring concern. Multiple students criticized poor sound in lecture recordings and called for better equipment and training for teachers delivering remote content: *"Better audio quality is urgently needed: it's lacking in many, if not most, recordings."*

Students also recommended better integration between learning platforms like Canvas and Uglu to streamline access to course materials, improve navigation, and simplify progress tracking. Integrated systems would support a more transparent and user-friendly learning environment.

To facilitate communication, students proposed using open discussion platforms such as Piazza, which would allow questions and answers to be shared more efficiently and reduce reliance on email. One participant suggested, *"Please reduce the need to email teachers with every question. I recommend using Piazza, which can be integrated with Canvas."*

Study Periods and Attendance

Students called for a more precise, purposeful approach to on-campus sessions ("lota"). As one student noted: *"If attendance is mandatory for study periods twice a semester, there should be a clear reason; activities that cannot be provided online."* Many questioned the necessity of physical attendance, particularly for non-practical courses. One student stated, *"I've never attended a study period that couldn't have been held online. This is not a vocational program,*

and mandatory attendance is unnecessary. Travel, accommodation, and time off work are expensive and logistically difficult, especially for those with families. Even with union support, the cost is high."

Students emphasized the need for consistent, transparent attendance policies, particularly for students with young children. In cases of illness or unexpected circumstances, remote attendance options such as Zoom should always be available. Some even proposed eliminating mandatory attendance or offering flexible alternatives to meet course requirements.

Teacher engagement

Students stressed the importance of accessible and responsive teachers. Timely responses to questions via Canvas or email were considered essential for adequate support: *"It would be helpful if all teachers aimed to respond to questions about assignments quickly and clearly."*

Many students requested that teachers offer weekly virtual office hours for questions and discussions, ideally scheduled during late afternoons or evenings to accommodate working students.

Regular updates about course progress, assignments, and changes were also encouraged. Clear organisation of materials within Canvas and consistent access to recorded sessions were viewed as essential for maintaining equitable learning opportunities. One student commented that disorganized course environments could be *"overwhelming"*, making it harder to navigate and focus on relevant content.

Mutual respect and understanding between teachers and students were highlighted as crucial. Teachers were encouraged to remain aware of students' diverse life circumstances and adapt teaching accordingly, using methods and technologies suited to remote learning.

Learning environment

Flexibility was regarded as a fundamental principle. Some students suggested utilizing the summer term more effectively: *"It would be great to extend the learning period into June, especially for full-time students. There could be a separate registration and fee structure for summer courses."*

Students also recommended improving physical learning spaces, such as libraries, by improving acoustics and adding facilities that accommodate students with disabilities. A well-structured, inclusive environment was seen as crucial to academic success.

Lastly, better coordination between courses within the same department or program was encouraged to reduce overlapping deadlines and enhance coherence. Aligning expectations across courses would help students manage their workload more effectively and understand the broader structure of their education.

5. Discussion: Implications for Policy and Practice

This study provides important insights into the experiences and challenges of distance learners at UNAK. The findings confirm that flexibility is the most critical factor influencing both the decision to choose distance learning and student satisfaction, with this pattern evident across respondents rather than being concentrated in specific demographic groups.

Flexibility allows learners to integrate education with work and family life, underscoring the importance of accessible course materials, clear and consistent communication, and the effective use of digital tools. These findings echo previous literature highlighting the significance of autonomy in learning for non-traditional student populations (Moore & Kearsley, 1996; Hodges et al., 2020).

However, this emphasis on flexibility presents a paradox. While autonomy and self-paced learning are appreciated, they can unconsciously reduce the level of guidance and interaction students receive, potentially undermining their progress. Prior research has similarly noted that some distance learners begin their studies at a disadvantage, requiring targeted support and structure to succeed (Björnsdóttir & Jóhannsdóttir, 2020).

After controlling for multiple comparisons, only one subgroup difference remained statistically significant: students in employment placed significantly greater emphasis on career advancement as a reason for choosing distance education. Other demographic patterns (e.g., differences by age, gender, or parental status in selected items) were observable at the raw *p*-value level but did not remain significant after correction; they should therefore be interpreted as exploratory signals rather than confirmatory subgroup effects. In practical terms, this reinforces the importance of keeping distance education visibly career-relevant, especially for working students, through clear links to professional competencies, authentic tasks, and flexible scheduling that supports continued labour market participation.

A consistent theme throughout the study was the preference for continuous assessment over high-stakes final exams. Smaller, more frequent assignments were seen as less stressful and more conducive to tracking learning progress. Students also had a strong desire for more practical, real-world assignments and increased opportunities for collaboration and discussion through digital platforms. These findings support the argument that assessment should align with the demands of contemporary workplaces and foster both reflection and long-term competence.

In terms of technology, Canvas was widely appreciated, while tools like Canvas Studio were less favourably reviewed. Students called for better audio quality in lecture recordings, more user-friendly tools, and greater consistency in how teachers use learning platforms. Access to teachers remained essential, with students asking for regular virtual office hours and faster responses to inquiries.

Mandatory attendance at in-person sessions posed a significant challenge, particularly for those living far from campus or managing work and caregiving responsibilities. Many questioned the necessity of physical presence for activities that could be delivered digitally. However, students also acknowledged the value of social and collaborative learning, suggesting that hybrid formats might offer a viable solution.

Overall, the results indicate that distance learners have diverse needs and expectations, shaped by personal circumstances and professional goals. Universities must therefore adopt flexible yet structured approaches, adjusting teaching methods, assessment practices, and technological tools to support both access and quality.

A key recommendation is to reduce reliance on final exams and expand the use of formative, cumulative assessment methods, including e-portfolios and project-based learning. These alternatives have proven effective in health and education fields (Davis et al., 2009) yet remain underutilized elsewhere. Recognition of prior learning may also serve to acknowledge students' existing competencies, as demonstrated in education programs in Iceland (Hreinsdóttir & Sigurðardóttir, 2022).

Equally important is ensuring that all teachers are proficient in using distance education tools, that course materials are consistently accessible, and that the digital learning environment is well-organized. Improvements in audio/video quality, greater use of collaborative platforms, and standardization of course design within learning systems could significantly enhance the student experience.

Lastly, this study invites a broader reflection on the concept of flexibility itself. For some, it

means studying at any time, place, and pace; for others, it involves having greater control over the order and structure of learning activities (Naidu, 2017). In all cases, students seek space to adapt their studies to the realities of work and life.

Despite the study's low response rate, the findings provide important indicators of the challenges distance learners face. Nevertheless, the voluntary sample and single-institution setting limit generalisability and raise the possibility of nonresponse bias. Because the survey was distributed within one small, regional Icelandic university, the results reflect UNAK's programme mix, organisational routines (e.g., "lota" study sessions), and local infrastructure. They may not transfer directly to larger universities or systems with different regulatory and technological conditions. Self-selection likely favoured students with stronger engagement, higher study demands, or more evident experiences (positive or negative), which may help explain the overrepresentation of women and postgraduate/doctoral students in the valid sample. In addition, the cross-sectional, self-reported measures capture perceptions rather than objective learning outcomes. Because multiple item-level subgroup comparisons were conducted, we controlled for false positives using BH-FDR adjustment; consequently, most demographic differences should be treated as exploratory and hypothesis-generating rather than definitive. The subgroup comparisons are exploratory and may be underpowered in smaller groups; multiple testing also increases the risk of chance findings. These limitations are considered when interpreting the results and are partially mitigated through triangulation with the open-ended responses. Accordingly, the findings should be read as context-specific, hypothesis-generating evidence rather than population estimates. Future research should build on this work through qualitative interviews or focus groups, exploring in greater depth how students experience new teaching approaches and technologies. Multi-institution studies across Iceland (and comparable Nordic settings) would allow stronger claims about transferability. At the same time, longitudinal designs could examine whether changes, e.g., improved audio quality, assessment redesign, or reduced attendance requirements, translate into better retention, completion, and learning outcomes.

Yet, distance education has moved beyond being an emergency solution to becoming a core component of higher education. Its success depends not just on technology but on thoughtful, evidence-based design that centers the lived realities of diverse learners. Rather than implying a universal model, this study uses UNAK as an illustrative case to surface practical design tensions, flexibility versus structure, asynchronous access versus interaction, and assessment authenticity versus logistical burden, that many institutions may recognise in different forms. Institutions considering these implications should therefore adapt them to their own student demographics, resources, and policy constraints, and evaluate changes with local data.

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Appendix A

Appendix A. Sample–population comparison as of 15.10.2024 (based on Háskólinn á Akureyri. (2024). *Nemendafjöldi*. <https://www.unak.is/is/haskolinn/um-ha/ha-i-tolum/nemendafjoldi>)

Dimension	Category	Sample n	Sample %	UNAK 2024 n	UNAK 2024 %	Difference in %
Gender n=140)	(valid Women	120	85.7	2,242	78.6	+7.1
	Men	20	14.3	606	21.2	−7.0
	Other	0	0.0	5	0.2	−0.2
Degree level n=141)	(valid Bachelor-level	96	68.1	1,816	63.7	+4.4
	Diploma-level	5	3.5	576	20.2	−16.6
	Master-level	40	28.4	452	15.8	+12.5
	Doctoral	0	0.0	9	0.3	−0.3

Note: UNAK “Diploma-level” = Grunndiplóma (325) + Viðbótardiplóma (251) = 576; Bachelor-level = Bakkalárstig (1,816); Master-level = Meistarastig (452); Doctoral = Doktorsnám (9).

Appendix B. Selected demographic differences (raw *p* and BH–FDR *q*)

Comparison	Item	Median (Group0 vs Group1)	<i>p</i>	<i>q</i> (BH–FDR)	<i>r</i> – <i>rb</i>
Gender (women vs men)	Online quizzes (learning method)	2.0 vs 3.0	0.032	0.347	0.359
Age (≤30 vs ≥31)	Short research articles (learning method)	2.0 vs 2.0	0.006	0.069	0.242
Age (≤30 vs ≥31)	Microsoft Teams (tool satisfaction)	2.0 vs 2.0	0.035	0.111	0.218
Age (≤30 vs ≥31)	Career advancement (reason)	2.0 vs 2.0	0.012	0.116	0.238

Comparison	Item	Median (Group0 vs Group1)	p	q (BH-FDR)	$ r_{rb} $
Working (no yes) vs Career advancement (reason)		3.0 vs 2.0	< .001	0.002	0.470
Working (no yes) vs Reduced travel time (reason)		3.0 vs 2.0	0.013	0.066	0.332
Kids (no kids) vs Written final exam (assessment satisfaction)		3.0 vs 4.0	0.009	0.087	0.252
Kids (no kids) vs Living/accessibility (reason)		2.0 vs 1.0	0.020	0.061	0.210
Kids (no kids) vs Better learning outcomes (reason)		3.0 vs 2.5	0.015	0.061	0.231

Note: Mann-Whitney U tests were used for two-group comparisons (ordinal Likert items). q -values are Benjamini–Hochberg FDR-adjusted within each demographic comparison $\times$ survey block. Effect size is the absolute rank-biserial correlation ($|r_{rb}|$).