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"Fostering Socially Distanced and Inclusive on Campus Education in Armenian HEIs"

NORTHERN UNIVERSITY (NU)

NEEDS ANALYSIS REPORT

Results of the Surveys on Teaching Staff Digital Competence Needs Assessment and Students Digital Learning Needs Assessment

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Contents

Introduction

The overall objective of the surveys was to give an in-depth evaluation of the current state of digital teaching, learning, and assessment (TLA) practices at Northern University. The questionnaires sought feedback from teachers and students on the availability, usage, and perceived usefulness of digital technologies, facilities, and study materials. Specifically, the study focused on the strengths and gaps of digital infrastructure, competency levels in digital skills, and the effectiveness of existing digital resources in supporting educational delivery. The surveys also explored the challenges and obstacles educators and learners face in integrating digital tools into the teaching and learning process. The insights gained from this data collection are intended to guide strategic decision-making for enhancing the university's digital infrastructure, improving training programs, and developing relevant digital content. Ultimately, these efforts aim to foster a more inclusive, effective, and future-ready digital learning environment for all members of the university community.

Section 1: General Information

The survey involved 31 NU teachers and 336 students. It revealed some notable trends in composition and demographics.

1.1. Teachers' characteristics

Teacher positions: Most respondents (23 or 74.19%) are professors, while associate professors make up just over a quarter (five, or 25.81%). The primary voices in this survey come from those more directly involved in the day-to-day teaching process, rather than academic administrators or senior faculty. This is valuable because it offers insight into the digital needs of the educators who are most consistently in contact with students.

Age groups: Most respondents fall into the 36–45 age range (13 respondents, or 41.94%), followed by two equally sized groups: 20–35 and 46–55, with seven respondents from each group, or 22.58%. The presence of older respondents (3 respondents, 56–65: 9.68%, over 65: 3.23%) is relatively small but still noteworthy. What stands out here is that most respondents are in their mid-career phase. This age group is typically familiar with foundational digital tools but may still need structured upskilling in more advanced or pedagogically innovative platforms.

Gender distribution: The teaching staff is predominantly female (24 respondents or 77.42%), with males making up just seven respondents or 22.58% of the sample. Here we see an imbalance between the females and males, which should be considered when designing targeted capacity-building initiatives. However, this reflects the state of things at the university, where female teachers make up most of the faculty staff. This characteristic will be considered when the composition of the training groups is maintained.

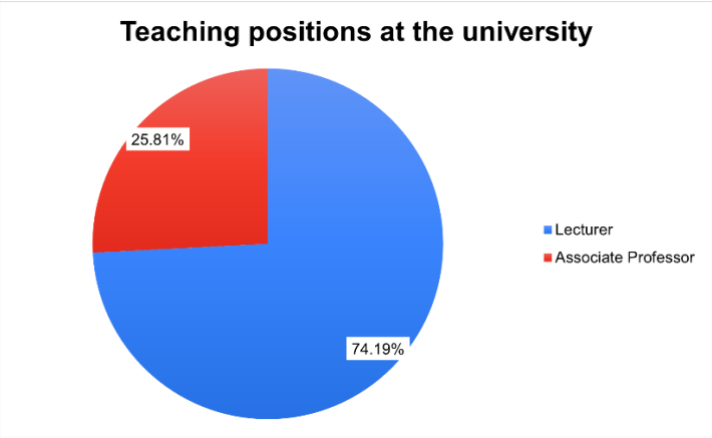

Image 1.1. Teaching positions at the university

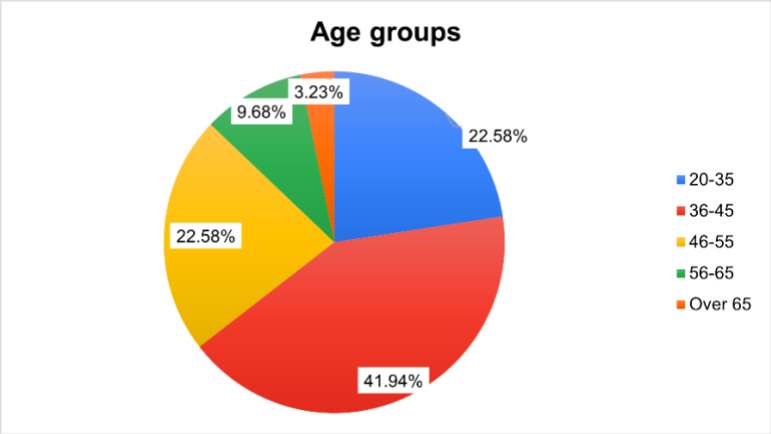

Image 1.2. Teachers' age groups

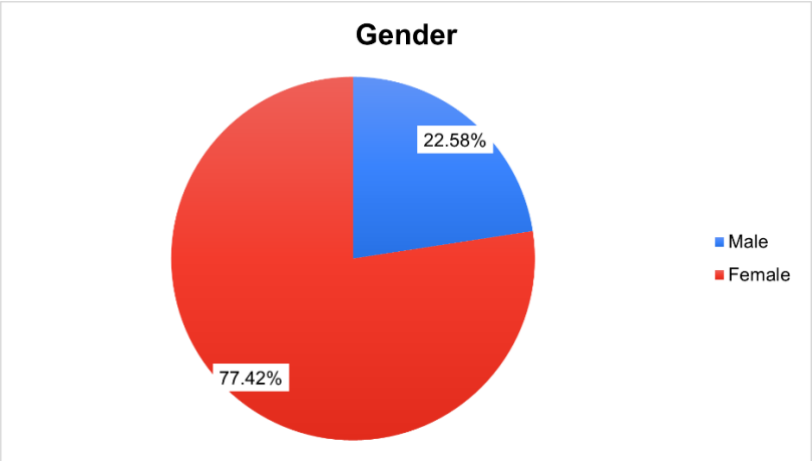

Image 1.3. Teaching staff gender

1.2. Students' characteristics

Educational level: Most - 278 students (82.74%) are enrolled in Bachelor programmes. A smaller portion (56 students or 16.67%) are Master's students, and only a small fraction (2 students or 0.60%) are in doctoral studies. Since most undergraduate students concentrate on practical skills and employability, the focus on choosing methods and approaches makes sense for a higher education institution where students' primary interests are likely centered on practical skills and employability at the undergraduate level. It also means that most digital learning needs related to early-stage bachelor students should revolve around practical, engaging tools rather than deep theoretical content.

Gender: Among the student respondents, 210 (62.5%) are female and 128 (37.5%) are male. This is not as stark a divide as among the teaching staff, but it still shows a substantial female majority. Again, this may affect how digital materials are designed and delivered, based on different engagement strategies and user behavior patterns.

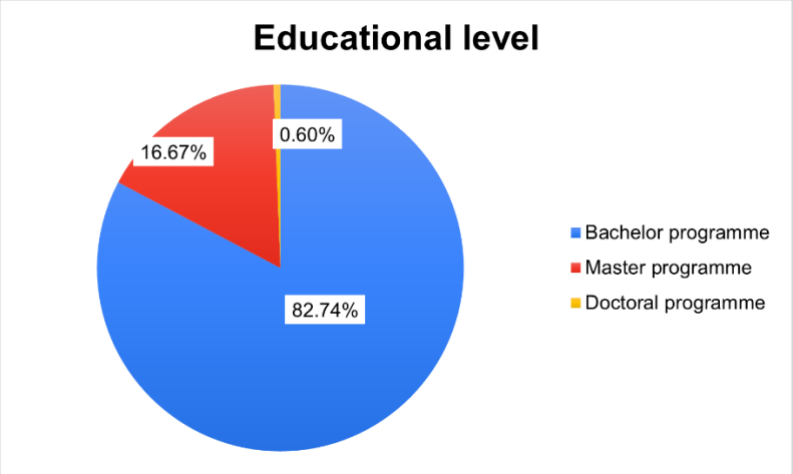

Image 1.4. Students' educational level

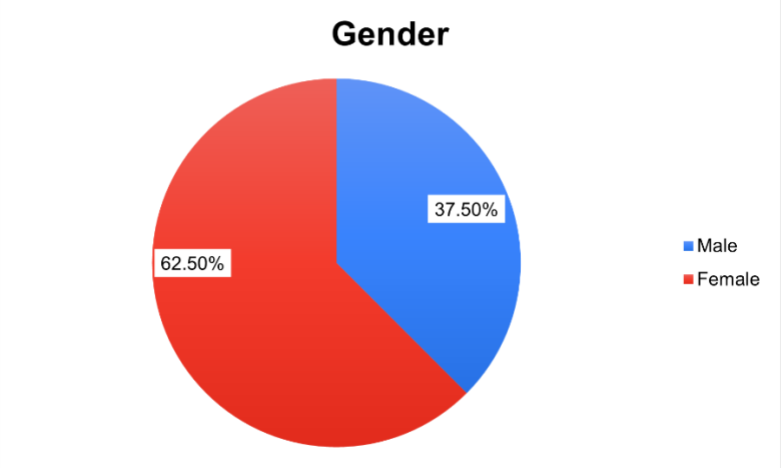

Image 1.5. Students' gender

Key Findings for Section 1:

Teachers: The survey revealed that mid-career educators are the most prevalent. They are open to diverse digital tools but will benefit from context-specific training.

Students: The larger share of undergraduate students suggests that digital innovations should focus on entry-level learning experiences that combine practical relevance and accessibility. The gender imbalance may also influence pedagogical approaches, and female-specific strategies should be used to help female students achieve better results in shaping learning outcomes throughout courses and study programs. Overall, this is a well-structured and demographically balanced sample that offers a realistic view of the institution's current digital learning and teaching environment.

Section 2: Digital Competencies and Technologies in Teaching, Learning and Assessment (TLA)

The analysis of the current use of digital competences shows a notable contrast between teaching staff and students in terms of adoption and perception of various TLA (teaching, learning, and assessment practices) at Northern University. The analysis of NU's current use of digital competencies and technologies reveals a notable contrast between teaching staff and students regarding both adoption and perceived importance of various digital practices in teaching, learning, and assessment (TLA).

2.1. Digital Competencies and Technologies Currently Applied

Among the 31 teachers who participated in the survey, the highest percentage (over 90%), reported frequent use of digital technologies to communicate with students regarding organizational matters. This was followed closely by the use of digital resources for continuous professional development and teaching aligned with learning objectives (approximately 80%). Other prominent competencies included:

- Sharing and exchanging knowledge (~75%)
- Using digital devices and pedagogical methods (~72%)
- Developing and assessing pedagogical competencies (~70%).

Notably, there was a steady drop in teacher-reported usage for more collaborative or student-centred digital practices such as:

- Digital technologies for hybrid learning (~15%)
- Ensuring students' physical and social well-being using digital tools (~10%)
- Personalizing learning pace or trajectory (~12%).

This suggests a higher focus on instructor-centred communication and planning rather than learner-centred personalization or well-being, which presents a significant concern as it may hinder student engagement, motivation, and overall learning outcomes.

The student survey involved 336 participants. While students broadly recognized the teachers' use of digital communication tools (around 45%), the reported usage

percentages were generally lower across almost all categories than the teachers' responses. Interestingly, students placed relatively more emphasis (in comparison to teachers) on:

- Digital tools for collaboration and self-study
- Engaging with digital content creation
- Fostering creativity and problem-solving through digital means.

However, they were less aware of or impacted by:

- Digital tools used for assessment or data analytics
- Blended/hybrid learning strategies
- Resources supporting accessibility and well-being.

This highlights a perception gap: teachers consider themselves active in digital teaching strategies, but students either do not perceive them as impactful or see them applied inconsistently.

Areas of Focus	Teacher Agreement	Student Recognition	Observations
Communication with students (organizational)	Very high (~90%)	Moderate (~45%)	Most consistent across the groups
Digital professional development	High (~80%)	Very low	Students are unaware of backend efforts
Digital tools for active, collaborative learning	Moderate (~50%)	Higher than expected	Students desire more of this
Digital feedback and analytical tools	Low to Moderate	Low	Underused or under-communicated
Support for well-being and inclusiveness	Very low	Very low	Lacks prioritization
Hybrid/blended learning/organization	Very low	Low	Opportunity area

The radar chart further emphasizes the disproportion between teacher and student responses. Teachers' feedback forms a large, confident perimeter in categories linked to planning, communication, and formal pedagogy. In contrast, students' responses form a significantly smaller cluster focused more on interactive and participatory experiences. Thus, while teachers report strong engagement with core digital teaching tools and structures, students indicate a limited experience of these efforts. This signals a need to translate backend preparation into more visible, interactive student-facing practices. Enhancing feedback mechanisms, personalization, hybrid learning integration, and support for student well-being would improve the perception and impact of digital TLA initiatives.

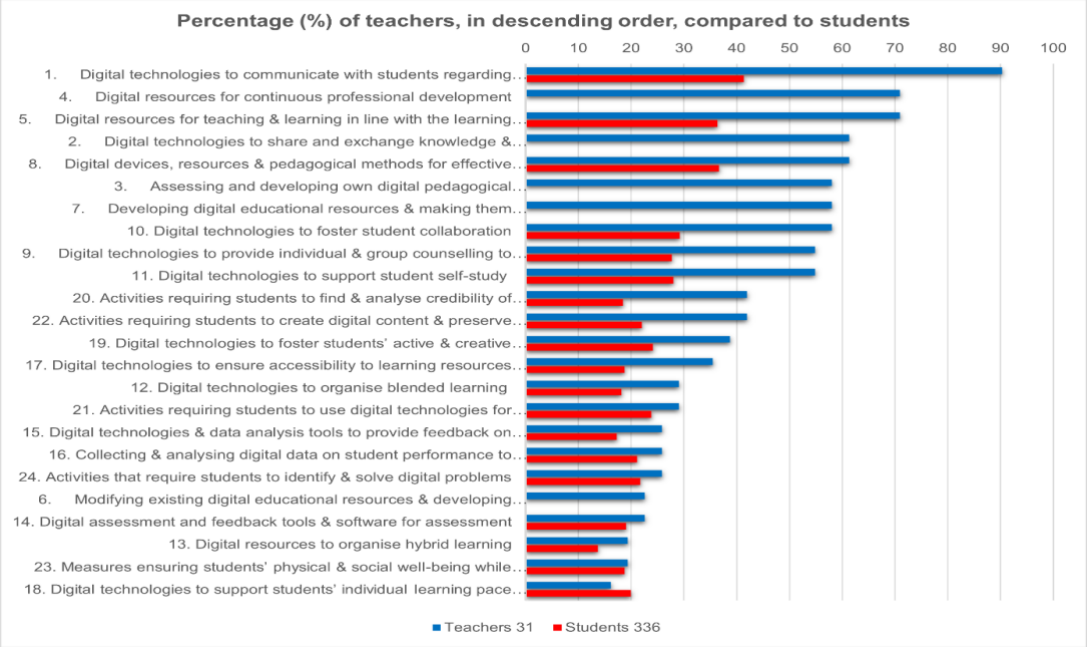

Image 2.1.1. Percentage (%) of teachers, in descending order, compared to students

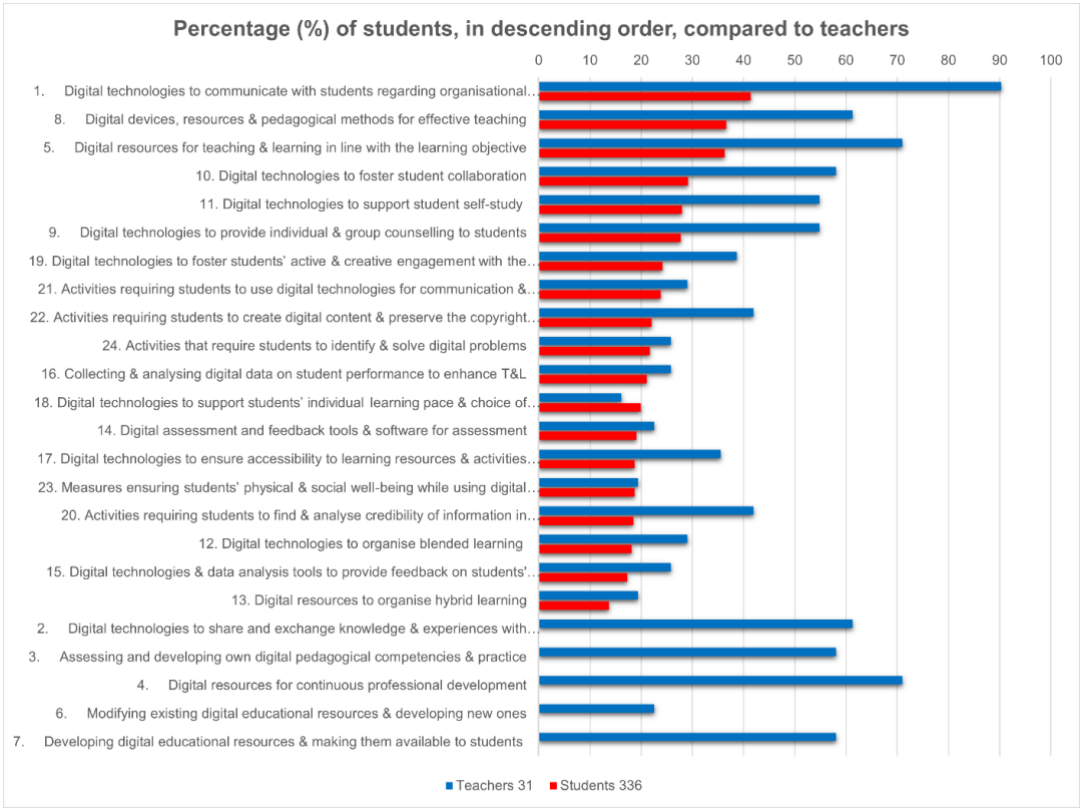

Image 2.1.2. Percentage (%) of students, in descending order, compared to teachers

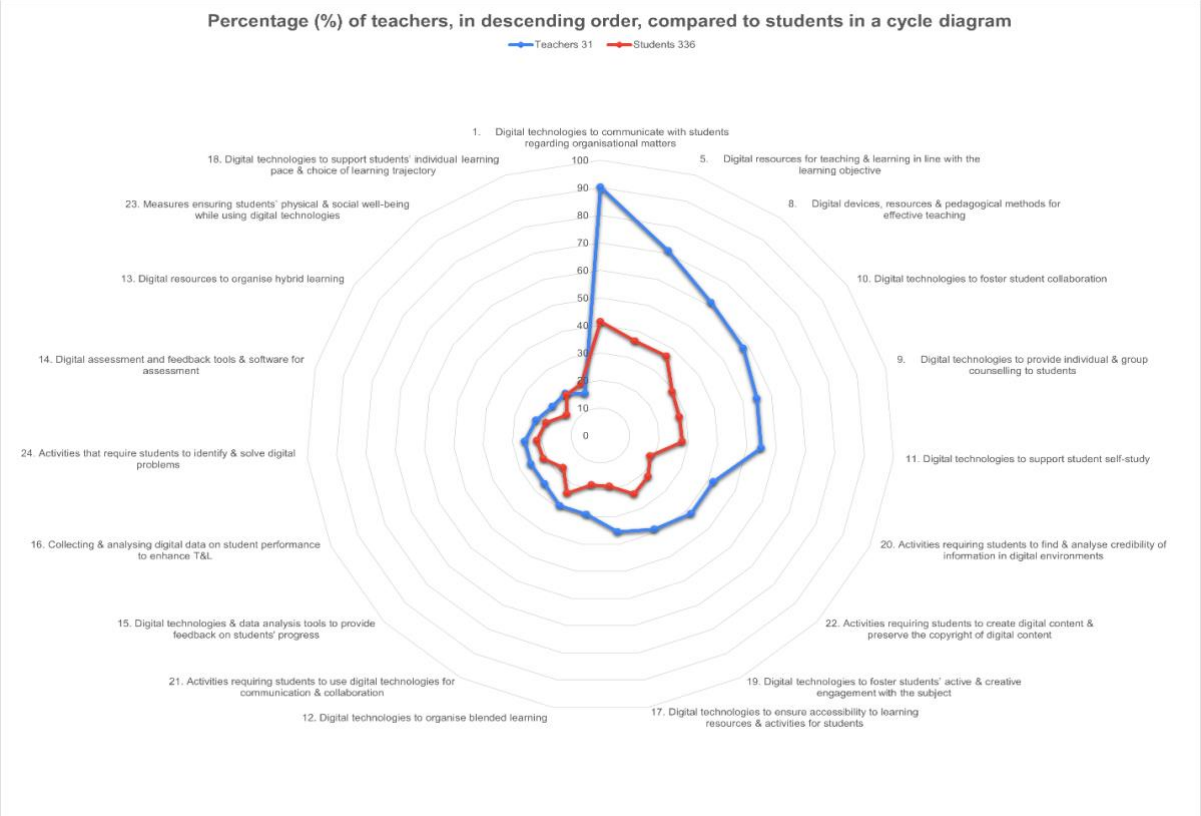

Image 2.1.3. Percentage (%) of teachers, in descending order, compared to students in a cycle diagram

2.2. Level of Need for Developing the Digital Competencies and Technologies1

The feedback from 31 teachers and 336 students on digital competences reveals several trends based on their ratings, which range from 0 to 3.

Key Findings:

1. Overall Need Perception

- Students consistently rated higher levels of need across almost all categories compared to teachers.
- Teachers' needs cluster between 1.0 and 1.9 on the scale, while students' needs approach or reach 2.0 in multiple categories, indicating a more urgent demand for digital support from the student perspective.

2. Top Priority Areas for Teachers

Teachers reported the highest needs in the following areas:

- Digital communication with students (1.9)
- Digital resources for professional development (1.85)

[1] This indicator (weighted average rating) is calculated by multiplying the number of people who gave ratings of 0, 1, 2, and 3 by the corresponding rating, summing these products, and dividing by the total number of respondents. For example: (0 x 10 people + 1 x 20 people + 2 x 30 people + 3 x 20 people) / (10+20+30+20) people = 140 / 80 people = 1.75 (out of a maximum of 3).

- Developing pedagogical competencies (1.75)
- Creating and preserving digital content (1.7)

These points to an intense desire among faculty to enhance their core digital teaching practices and to stay up to date professionally.

3. Top Priority Areas for Students

Students indicated uniformly high need levels (close to 2.0) in a broader range of areas, particularly:

- Digital communication with teachers
- Engagement tools (gamification, interactivity, creativity)
- Self-paced learning support
- Accessibility and inclusion
- Assessment and feedback tools

It has become clear that students are concerned about content delivery and personalized learning, interactivity, and inclusive approaches.

4. Key Discrepancies

The largest perception gaps are in:

- Students perceive a higher need than teachers.
- Well-being and learning pace tools **–** students significantly value support technologies in these areas.
- Blended/hybrid learning resources **–** seen as lower priority by teachers than students, indicating a potential mismatch in pedagogical expectations.

5. Shared Priorities

Both groups ranked digital communication, teaching tools aligned with learning objectives, and content creation and sharing as relatively high-priority needs, highlighting these as natural starting points for institutional investment. It has become apparent that while teachers focus on improving professional competencies and communication, students are calling for a broader systemic integration of learner-centered digital tools. Institutions should strike a balance between these perspectives to design responsive digital capacity-building initiatives.

Image 2.2.1. Needs of teachers on a scale of (0, 1, 2, 3), in descending order, compared to students

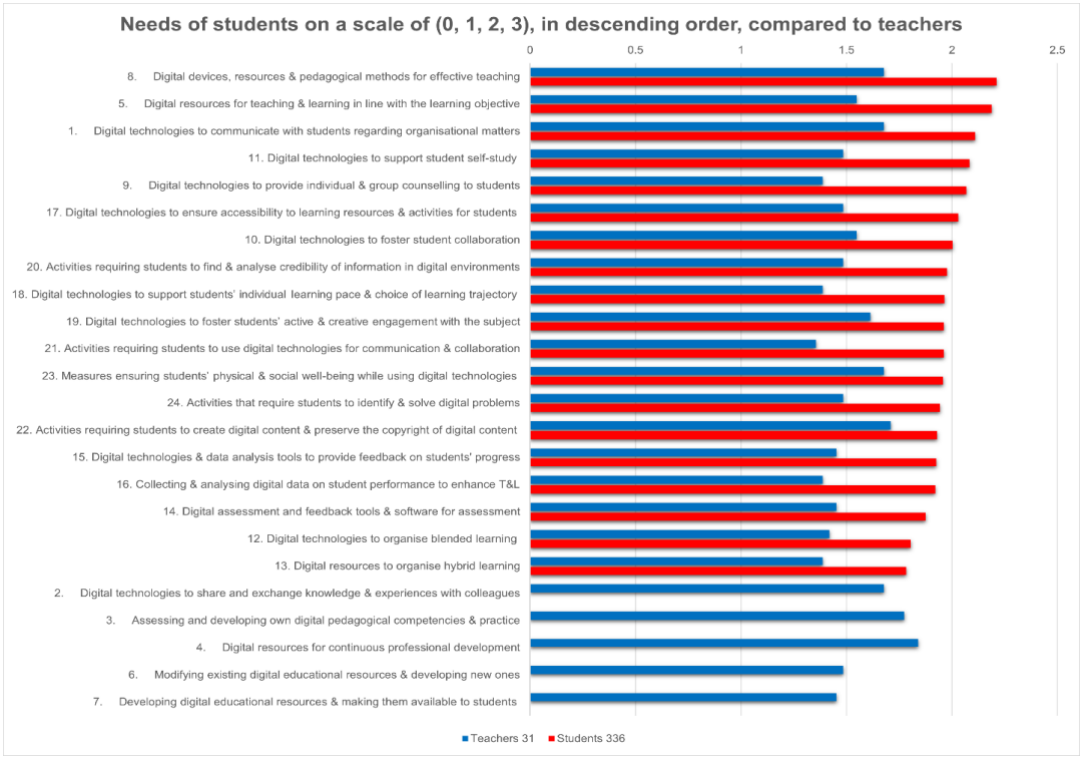

Image 2.2.2. Needs of students on a scale of (0, 1, 2, 3), in descending order, compared to teachers

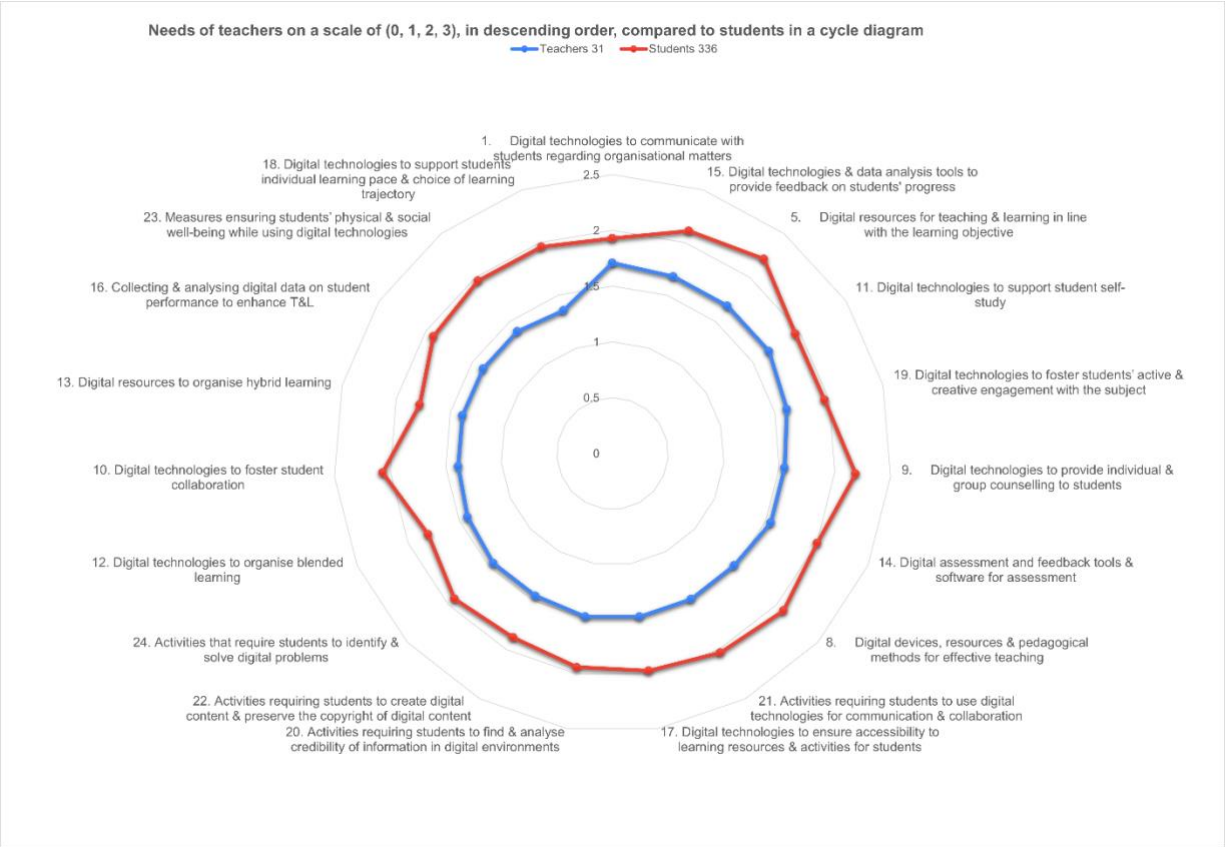

Image 2.2.3. Needs of teachers on a scale of (0, 1, 2, 3), in descending order, compared to students in a cycle diagram

Section 3: Technologies and Facilities Supporting Digital TLA

3.1. Technologies and Facilities Currently Applied to Support Digital TLA

This section presents the feedback from teachers and students on how they perceive and utilize digital technologies and facilities to support teaching, learning, and assessment (TLA) at Northern University.

General trends: The comparison charts between teachers and students indicate an apparent discrepancy in both awareness and usage of digital tools. Teachers report higher usage of nearly all listed technologies, which may reflect both a responsibility to implement these tools and greater exposure due to training or institutional expectations.

Top tools among teachers:

- Smartphones (90%) and Printers/Copiers/Scanners (85%) are reported as the most used tools among teaching staff, highlighting a dependence on mobile and print technologies.
- Virtual classrooms (80%), LMS (Learning Management Systems) (75%), and personal computing devices follow closely, indicating strong integration of blended and online learning platforms.

- A notable 60-70% also reported using tools like projectors, online assessments, interactive whiteboards, and Internet infrastructure, confirming a robust digital environment for instructional delivery.

Top tools among students:

- The highest student-reported tools include LMS (65%), Smartphones (45%), Chat sessions (real-time or asynchronous) (43%), and Printers (40%).
- While students use many tools, their usage levels are significantly lower than those of teachers, suggesting either limited access, digital confidence, or less integration in course delivery.
- Students also show a preference for communication tools (e.g., LMS chat sessions), which points to their need for responsive and real-time interaction in digital settings.

Emerging and less common technologies:

- Both groups show minimal exposure to cutting-edge tools such as AI feedback tools, semantic search, text-to-speech, speech recognition, and VR/AR headsets (usage generally below 10%).
- This indicates a lack of infrastructure and insufficient training and pedagogical integration for advanced tools that support personalization, immersion, and accessibility.

Gaps and needs:

- Students appear to underutilize key institutional tools like virtual classrooms, interactive whiteboards, and digital games/simulations, possibly due to limited user rights or lack of involvement in tech-driven pedagogy.
- Teachers are significantly ahead in the adoption of back-end and content delivery tools, including assessment systems, AI planning tools, and smartboards. In contrast, students are more focused on communication and collaboration platforms.

Recommendations:

1. Student-Centered Training: Workshops or orientation modules for students to familiarize them with institutional tools, especially those used by teachers, would reduce the usability gap.
2. Enhancing AI and Accessibility: Investing in AI-powered tools and accessibility features, such as speech recognition and alternative input devices, is necessary to modernize inclusive teaching practices.
3. Promotion of Emerging Technologies: Gradual incorporation and demonstration of VR/AR, semantic web tools, and multimedia creation platforms can align the digital ecosystem with future-ready learning.
4. Feedback Loop: Continuous student feedback on tool effectiveness can ensure resources meet both teaching and learning expectations.

The analysis reveals that while a strong technological foundation exists, the institution needs to bridge the gap between teacher tool usage and student engagement to ensure an inclusive and efficient digital learning environment.

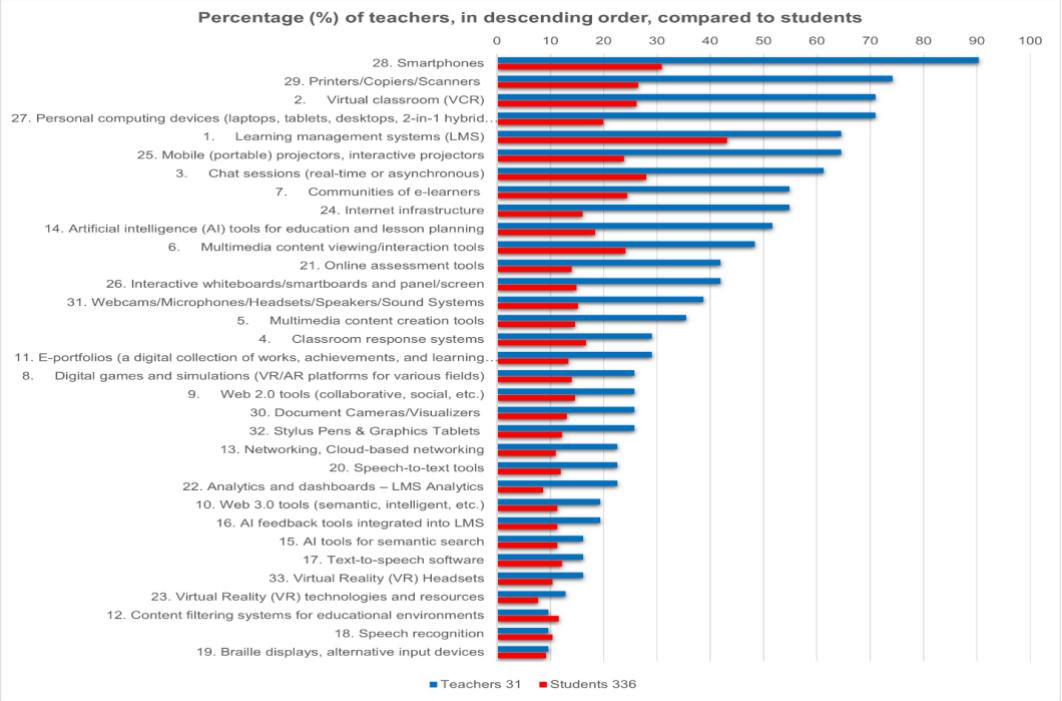

Image 3.1.1. Percentage (%) of teachers, in descending order, compared to students

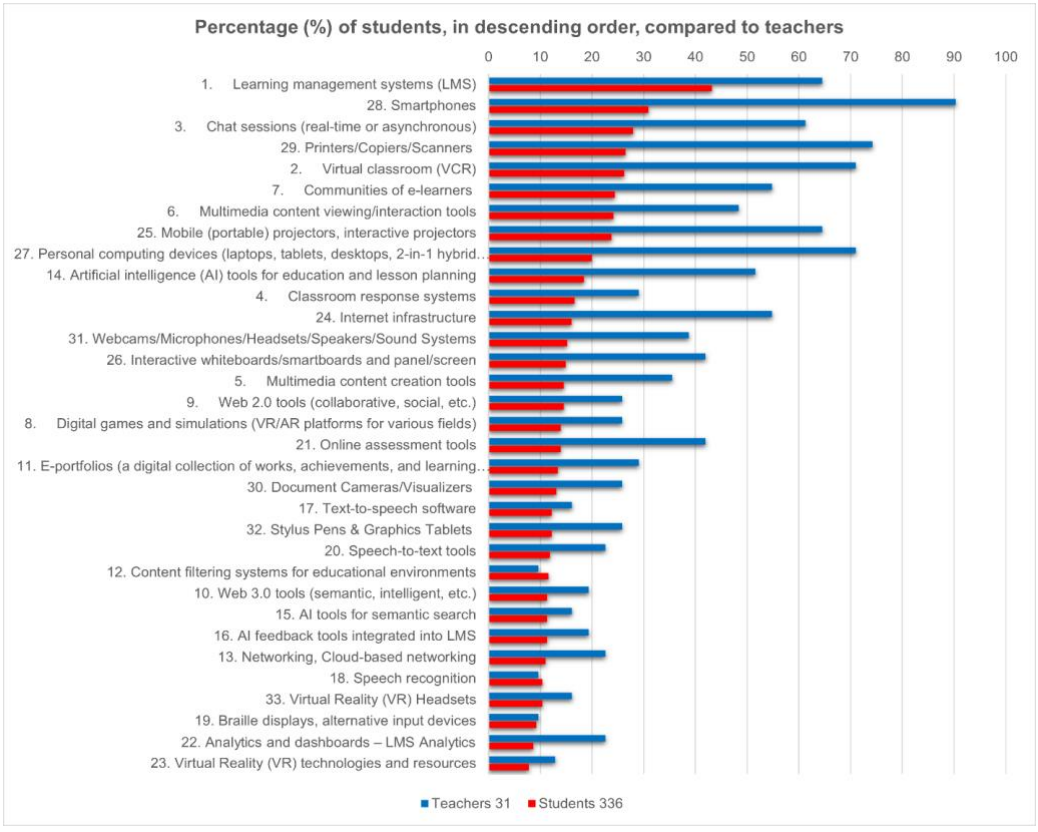

Image 3.1.2. Percentage (%) of students, in descending order, compared to teachers

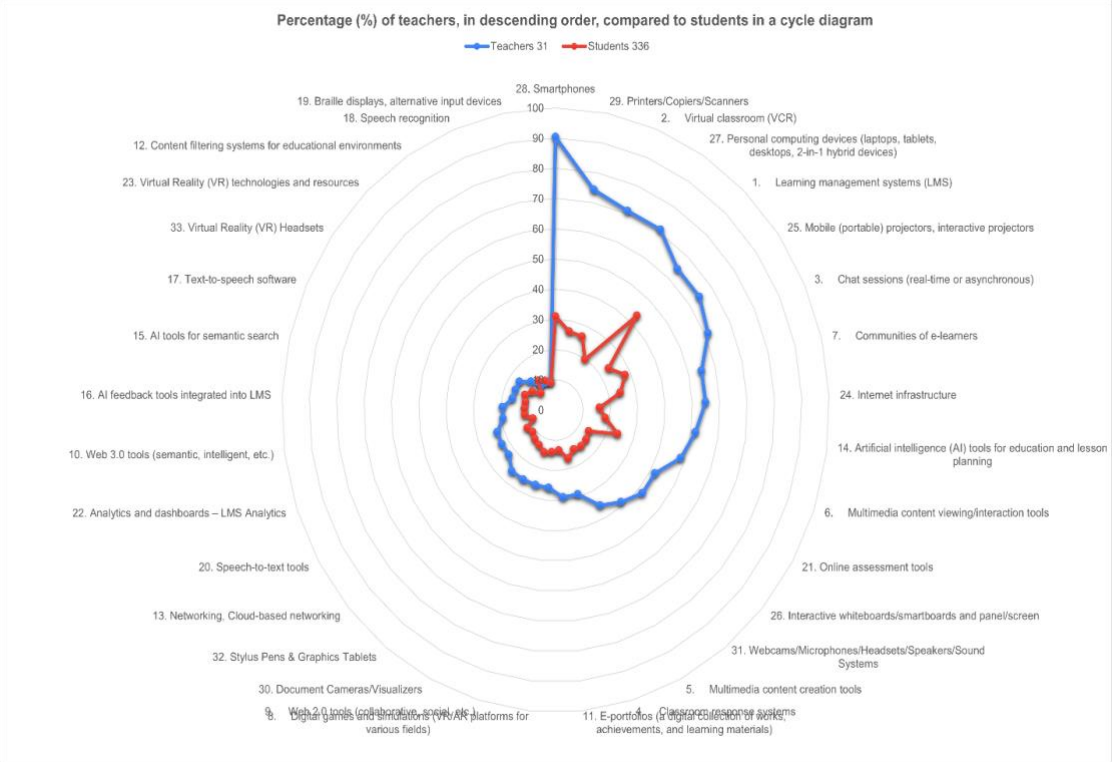

Image 3.1.3. Percentage (%) of teachers, in descending order, compared to students in a cycle diagram

3.2. Usefulness of the Technologies and Facilities Supporting Digital TLA

The data reveals how teachers and students perceive the usefulness of various digital technologies and facilities for teaching, learning, and assessment (TLA). Both groups rate most technologies positively but show some notable differences in preferences and perceived value.

Usefulness by Teachers Compared to Students

Top-rated technologies by teachers:

- Learning Management Systems (LMS) score highest, reflecting a strong appreciation for platforms that manage course content and activities.
- Smartphones, multimedia content tools, and personal computing devices also rank very highly, showing teachers value versatile and interactive digital tools.
- Projectors, virtual classrooms (VCR), communities of e-learners, and printers/copiers/scanners round out the top 10, emphasizing a blend of traditional and digital teaching supports.

Teachers' strong ratings:

- Interactive whiteboards, multimedia content creation, and chat sessions are also rated useful.
- Teachers view AI tools for education and lesson planning, online assessment tools, and sound systems as highly valuable, indicating their openness to innovative technology.

Less valued by teachers:

- Emerging technologies, such as Virtual Reality (VR) headsets, Braille displays, speech recognition, and AI feedback tools, have lower usefulness ratings, likely due to limited integration or a lack of experience.

Comparison with students:

- Teachers generally rate technologies as more useful than students, especially traditional instructional technologies (LMS, projectors, printers) and content creation tools.
- Some technologies have near-parity in ratings (chat sessions, AI tools).

Usefulness by Students Compared to Teachers

Top-rated technologies by students:

- LMS also tops students' list, confirming its central role in learning.
- Smartphones, printers, copiers, scanners, personal computing devices, virtual classrooms, and chat sessions follow closely.
- Students also rate multimedia tools, communities of e-learners, and interactive projectors highly.

Students' emphasis:

- Students give relatively higher usefulness scores to communication-related tools such as chat sessions and speech-to-text tools.
- Emerging technologies, such as Braille displays, speech recognition, and text-to-speech software, receive higher relative appreciation from students than from teachers.

Students' lower ratings:

- Tools such as classroom response systems, online assessment tools, and AI tools receive moderate ratings, indicating a need for growth in perceived value or usage.

Comparison with teachers:

- Students consistently rate several tools as less valuable compared to teachers, particularly traditional hardware (such as projectors and printers).
- Students place a slightly higher value on accessibility and communication aids, reflecting their direct learning experience needs.

Usefulness by Teachers Compared to Students in a Cycle

Visual trends:

- The cycle diagram clearly shows teachers' ratings generally curve above students' ratings, confirming teachers' broader or more positive views on many digital tools.
- Both groups align closely on the top tools (LMS, smartphones).
- Notable divergence is visible in tools related to AI, accessibility (Braille, speech recognition), and VR, where students' ratings are comparatively higher or closer.
- Tools associated with active learning and interactive content, such as multimedia tools and interactive whiteboards, are ranked higher by teachers.

Gaps identified:

- The diagram highlights the necessity to better align student experience with teacher expectations, particularly through improved training, access, or integration of tools.

Key Findings

- Strong Consensus on LMS and Smartphones: Both teachers and students acknowledge the critical importance of LMS platforms and mobile devices as central to the digital learning environment.
- Communication Tools More Valued by Students: Students emphasize real-time communication (chat sessions) and accessibility features (speech-to-text, text-to-speech) more than teachers, suggesting these tools enhance their learning experience significantly.
- Emerging Technologies Are Underused but Appreciated: VR, AI-driven tools, and accessibility devices receive mixed ratings but represent opportunities for innovative pedagogical approaches.
- Teachers' Higher Usefulness Ratings May Reflect Training and Responsibility: Teachers' generally higher ratings indicate greater familiarity or reliance on digital tools for delivery, while students' lower ratings may reflect limited access, awareness, or relevance in current teaching practices.
- Bridging the Gap Through Training and Access: Student-focused training to increase familiarity and digital confidence, coupled with broader integration of emerging technologies, can improve perceptions of usefulness and adoption.
- Enhance Accessibility Tools: Given students' relatively higher appreciation for accessibility-related tools, institutions should prioritize investments in this area to support diverse learner needs.

Conclusion

The analysis reveals a solid foundation of digital tools supporting TLA, with explicit agreement on key platforms, including Learning Management Systems (LMS) and smartphones. However, there is a marked divergence in perceived usefulness between

teachers and students for many tools, especially emerging and accessibility technologies. Addressing these gaps through targeted training, increased access, and integration of advanced technologies will enhance the digital learning experience, making it more inclusive, engaging, and effective for all stakeholders.

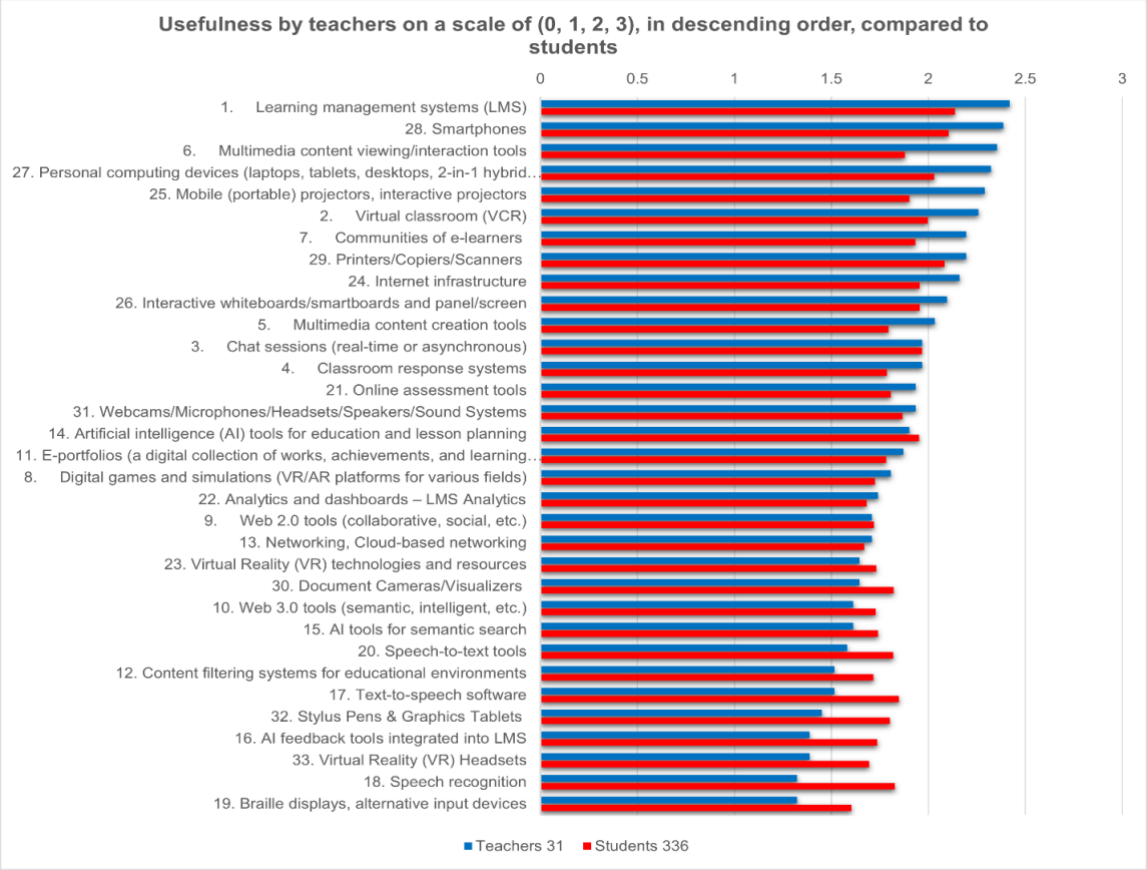

Image 3.2.1. Usefulness by teachers on a scale of (0, 1, 2, 3), in descending order, compared to students

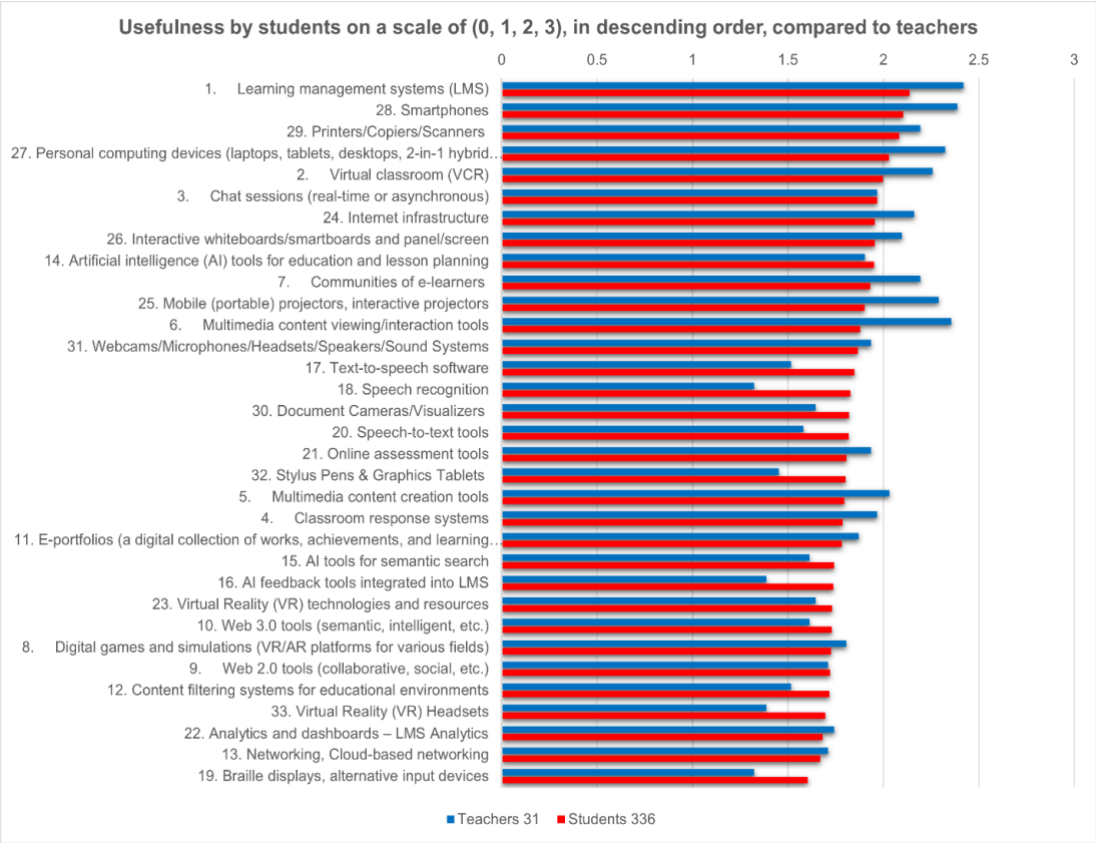

Image 3.2.2. Usefulness by students on a scale of (0, 1, 2, 3), in descending order, compared to teachers

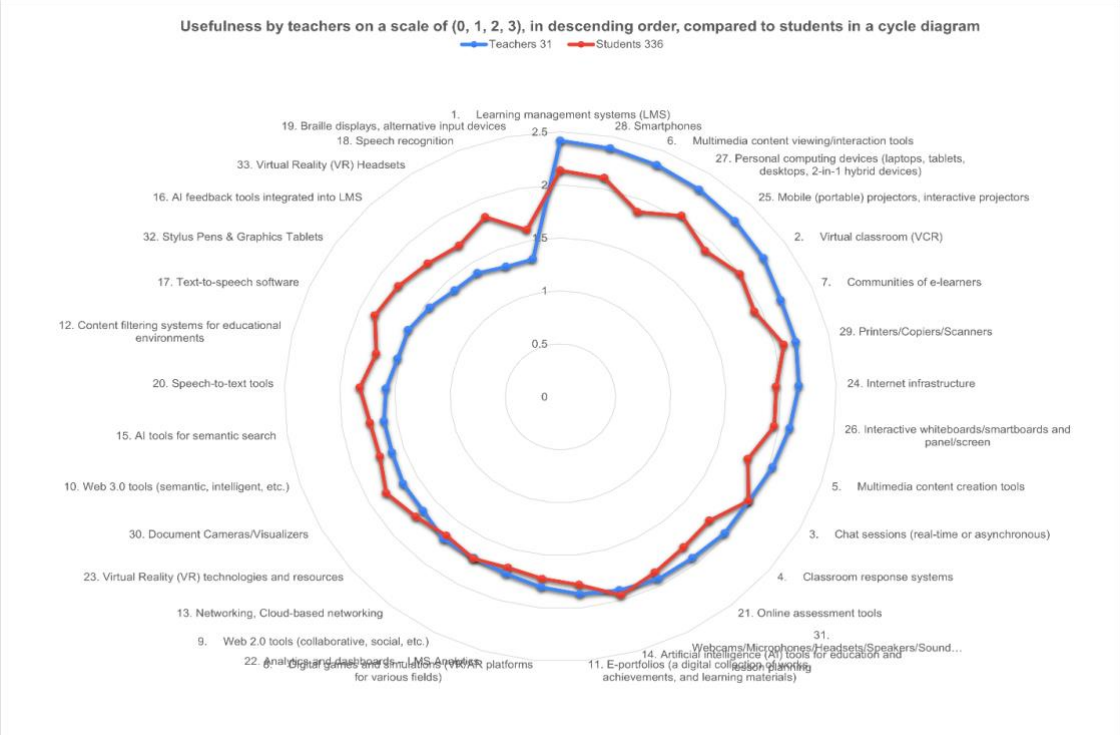

Image 3.2.3. Usefulness by teachers on a scale of (0, 1, 2, 3), in descending order, compared to students in a cycle diagram

Section 4: Teaching and Learning (Study) Materials

4.1. Study Materials Currently in Use

The data visualizations present insights into the types and perceived effectiveness of teaching and learning materials currently used at Northern University, from both teachers' and students' perspectives.

General Trends

- Teachers consistently report higher usage of all types of study materials compared to students.
  The study reveals that teachers are more involved in sourcing, preparing, and assigning these materials, while students may have limited access, lower engagement, or different preferences.
- Both groups rank textbooks, e-books, and course/lecture notes as the top three most used and useful study materials. These traditional resources remain fundamental in the educational process.
- There is a clear decline in use and demand for more digital or interactive materials like MOOCs, wikis, collaborative documents, and virtual labs/experiments, especially among students.

Materials Highly Rated by Teachers

- Textbooks (approx. 100%) and e-books (just under 100%) dominate the teaching materials used by faculty.
- Followed by course/lecture notes and study guides, which suggests teachers prepare and distribute comprehensive materials aligned with their instruction.
- Presentations (PowerPoint, Prezi) and academic articles/journals also have significant usage, reflecting a mixed approach of both traditional and multimedia materials.
- E-learning platforms (e.g., Moodle, Google Classroom) and video lectures show moderate use by teachers.
- Less frequently used are interactive and collaborative tools, indicating a potential area for further development.

Materials Highly Rated by Students

- Students also rate textbooks, course/lecture notes, and e-books as the most useful materials, consistent with teachers' preferences but with slightly lower percentages.
- Students show higher relative interest in reading lists, study guides, and presentations, indicating a demand for structured and summarized content.
- Use of e-learning platforms, narrated presentations, online lectures, and videos is notably lower among students compared to teachers, possibly due to access issues or engagement preferences.
- MOOCs, wikis, and virtual labs receive the least attention, suggesting these resources are either underutilized or less relevant to students' learning styles.

Comparative Insights

The cycle diagram visually reinforces the gap in material usage and perceived usefulness between teachers and students.

- Teachers show consistently higher engagement with all material types.
- The largest gaps appear with interactive, digital, and open resources (e.g., MOOCs, wikis, virtual labs).
- The smaller gaps are seen with core traditional resources such as textbooks and course notes, indicating agreement on their importance.

Recommendations for Improvement

1. Bridge the Student Engagement Gap

   Provide targeted orientation and support to increase student familiarity and use of digital, interactive, and collaborative materials like e-learning platforms, MOOCs, wikis, and virtual labs.

2. Enhance Access and Usability
   Ensure students have easy and equitable access to digital resources and devices required to engage with multimedia and online materials fully.

3. Incorporate More Interactive Content
   Encourage faculty to develop or adopt more interactive, multimedia-rich content that aligns with student preferences and modern pedagogical practices.

4. Continuous Feedback Mechanism
   Establish regular feedback channels for students and teachers to assess the relevance, accessibility, and effectiveness of study materials, enabling ongoing improvements.

5. Promote Blended Learning Models
   Integrate traditional materials with digital tools thoughtfully to leverage the strengths of both approaches for varied learning styles.

Conclusion

While teachers currently utilize a broad range of study materials, students' engagement is more focused on traditional resources, highlighting a significant opportunity to enhance the use of digital and interactive learning materials. Aligning the materials and support systems more closely with students' needs will strengthen the teaching and learning experience institution-wide.

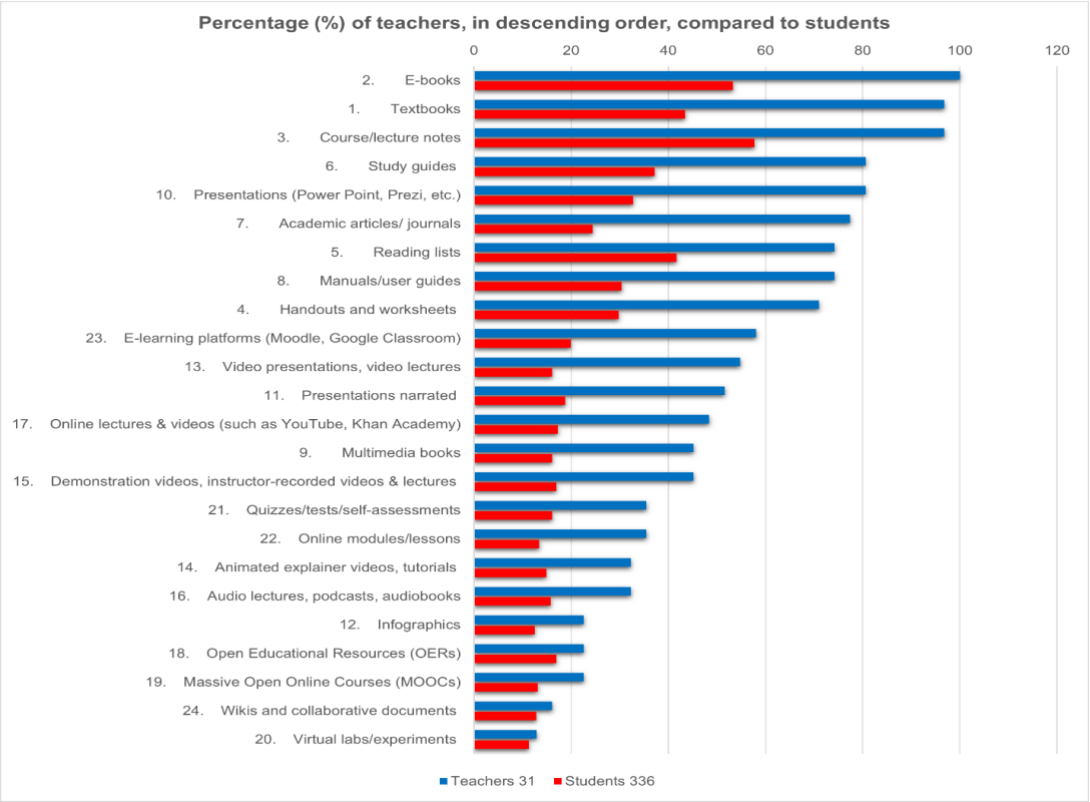

Image 4.1.1. Percentage (%) of teachers, in descending order, compared to students

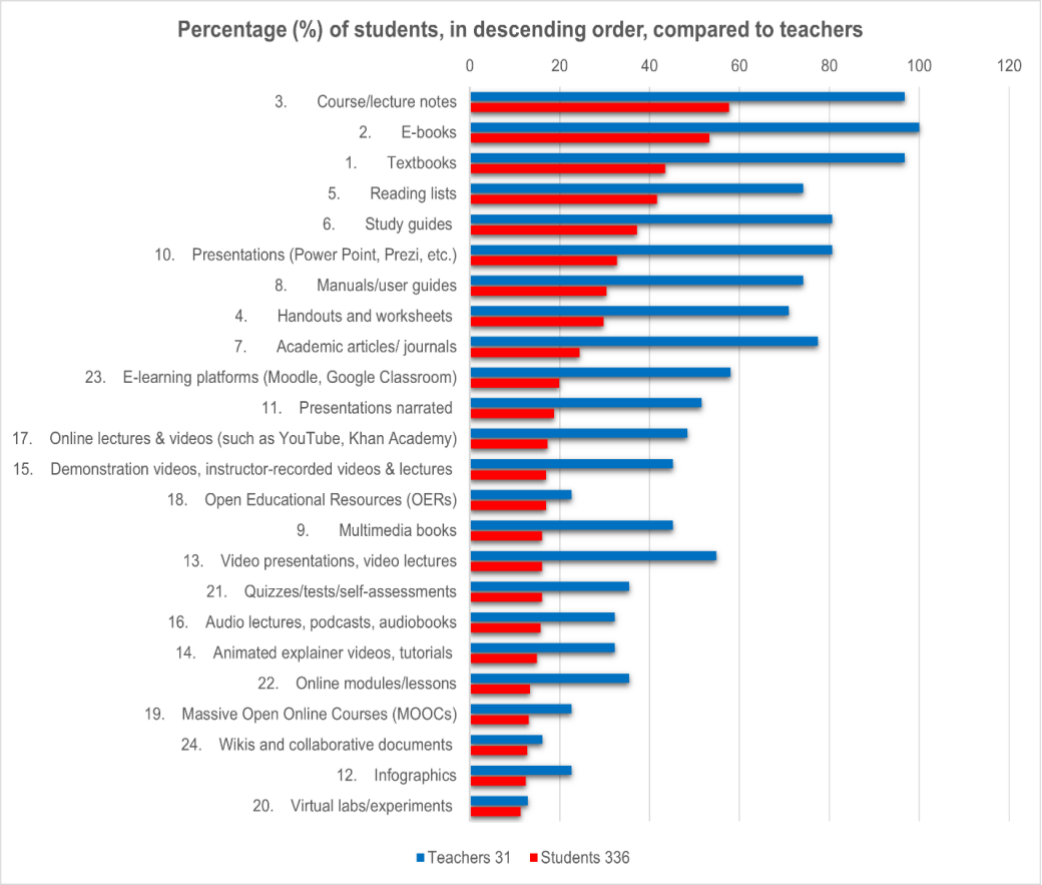

Image 4.1.2. Percentage (%) of students, in descending order, compared to teachers

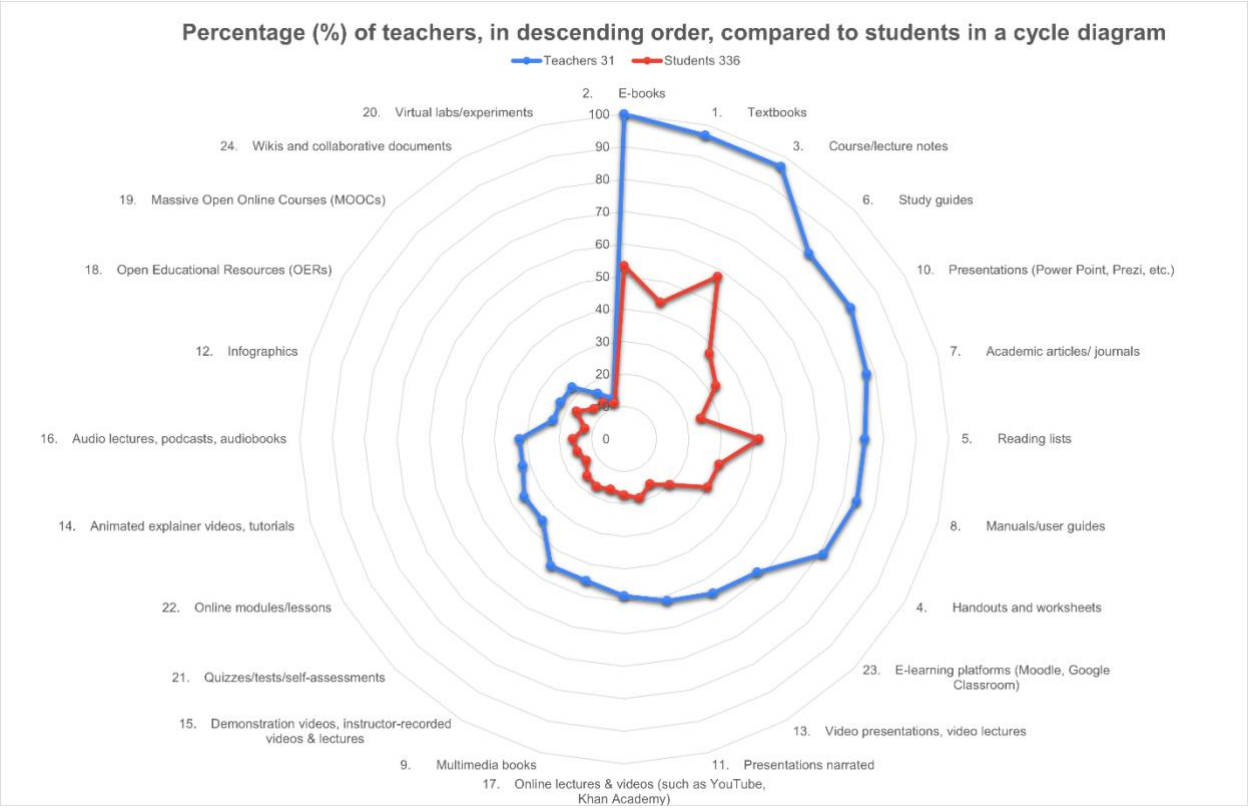

Image 4.1.3. Percentage (%) of teachers, in descending order, compared to students in a cycle diagram

4.2. Usefulness of the Study Materials for TLA

The data reflect the perceptions of the usefulness of study materials by both teachers (n = 31) and students (n = 336) on a scale of 0 to 3, where 0 = not helpful and 3 = highly useful. The study materials encompass a diverse range of digital and traditional resources that support teaching, learning, and assessment.

Key Insights from Teachers' Feedback

Top-rated materials:

- Textbooks, E-books, and Course/Lecture notes stand out as the most valuable materials for teachers, scoring near the top of the scale (close to 3).
- Study guides, Presentations (PowerPoint, Prezi), and Reading lists also receive strong positive evaluations.

Traditional vs digital:

- Traditional resources such as textbooks, handouts and worksheets, and academic articles/journals remain highly valued by teachers.
- Digital platforms like E-learning platforms (Moodle, Google Classroom), Online modules/lessons, and Video presentations/lectures are also recognized but with slightly lower ratings than traditional core materials.

Emerging materials:

- Materials such as Wikis and collaborative documents, Virtual labs/experiments, and Open Educational Resources (OERs) receive moderate usefulness scores, indicating room for growth or adoption.

Key Insights from Students' Feedback

Top-rated materials:

- Students rate Textbooks, Course/Lecture notes, and E-books highest, similarly to teachers, though the absolute scores are slightly lower than teachers' ratings.
- Reading lists, Study guides, and Presentations (PowerPoint, Prezi) also rank well but again slightly less useful than teachers perceive them to be.

Higher Preference for digital and interactive content:

- Compared to teachers, students rate Video presentations and lectures, Online lectures and videos (YouTube, Khan Academy), and Demonstration videos/instructor-recorded lectures higher in usefulness.
- This suggests students favor multimedia and visually engaging content more than traditional reading materials alone.

Moderate ratings for collaborative and open resources:

- Similar to teachers, students show moderate usefulness for Open Educational Resources (OERs), Virtual labs/experiments, and Wikis and collaborative documents, but with slightly higher relative scores compared to teachers.

Comparative Analysis:

- There is a consistent trend where teachers generally rate core academic materials (textbooks, e-books, lecture notes) slightly higher than students.
- Students show a stronger preference for dynamic and multimedia content (videos, narrated presentations, online lectures), reflecting contemporary learning preferences.
- Both groups show lower enthusiasm for collaborative tools and virtual labs, indicating potential underutilization or unfamiliarity.
- The usefulness gap suggests a need to bridge perceptions between teaching staff and learners, especially in adopting more interactive and digital resources.

Summary of Differences

Material Type	Teachers' Preference	Students' Preference	Notes
Textbooks, E-books, Lecture Notes	Very high usefulness (near 3)	High usefulness (slightly less)	Core foundational resources are highly valued across groups.
Presentations, Reading Lists	High	Moderate to High	Teachers favor structured presentations more than students.
Video and Online Lectures	Moderate to High	Higher than teachers	Students prefer more dynamic content for better engagement.
Open Educational Resources (OERs)	Moderate	Moderate to slightly higher	Growing interest, but still not top priority.
Collaborative Documents/Wikis	Lower	Slightly higher	Tools for collaboration underutilized or perceived less useful by teachers overall.
Virtual Labs/Experiments	Lower	Moderate	Potential for growth in experiential learning tools.

Recommendations

1. Align Materials with Learner Preferences:
   - Increase the development and integration of multimedia materials, such as videos, narrated presentations, and online interactive content, as students demonstrate a clear preference for this approach.
2. Enhance Awareness and Training:
   - Provide both students and teachers with training on less-utilized digital resources, such as virtual labs, collaborative documents, and OERs, to boost adoption and perceived usefulness.
3. Blend Traditional and Digital:
   - Maintain core traditional materials (textbooks, lecture notes) while strategically incorporating engaging digital content to enrich learning experiences and accommodate diverse preferences.

4. Feedback Mechanisms:
   - Establish regular feedback loops to continuously assess the usefulness of study materials and adapt offerings to meet evolving needs.

Overall, while traditional materials remain fundamental, there is a marked student preference toward more engaging, multimedia resources. Bridging this gap through targeted resource development and user support can enhance teaching and learning effectiveness.

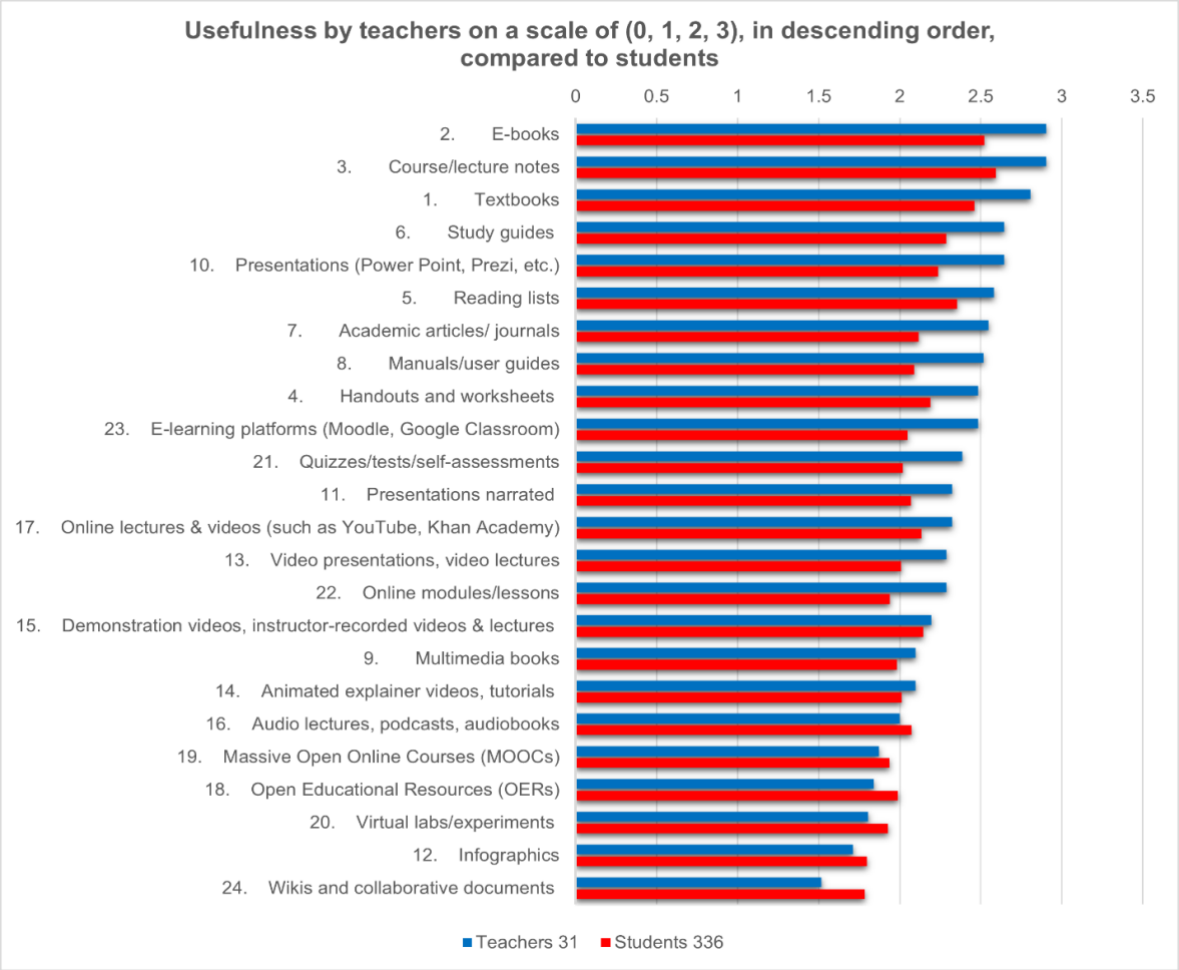

Image 4.2.1. Usefulness by teachers on a scale of (0, 1, 2, 3), in descending order, compared to students

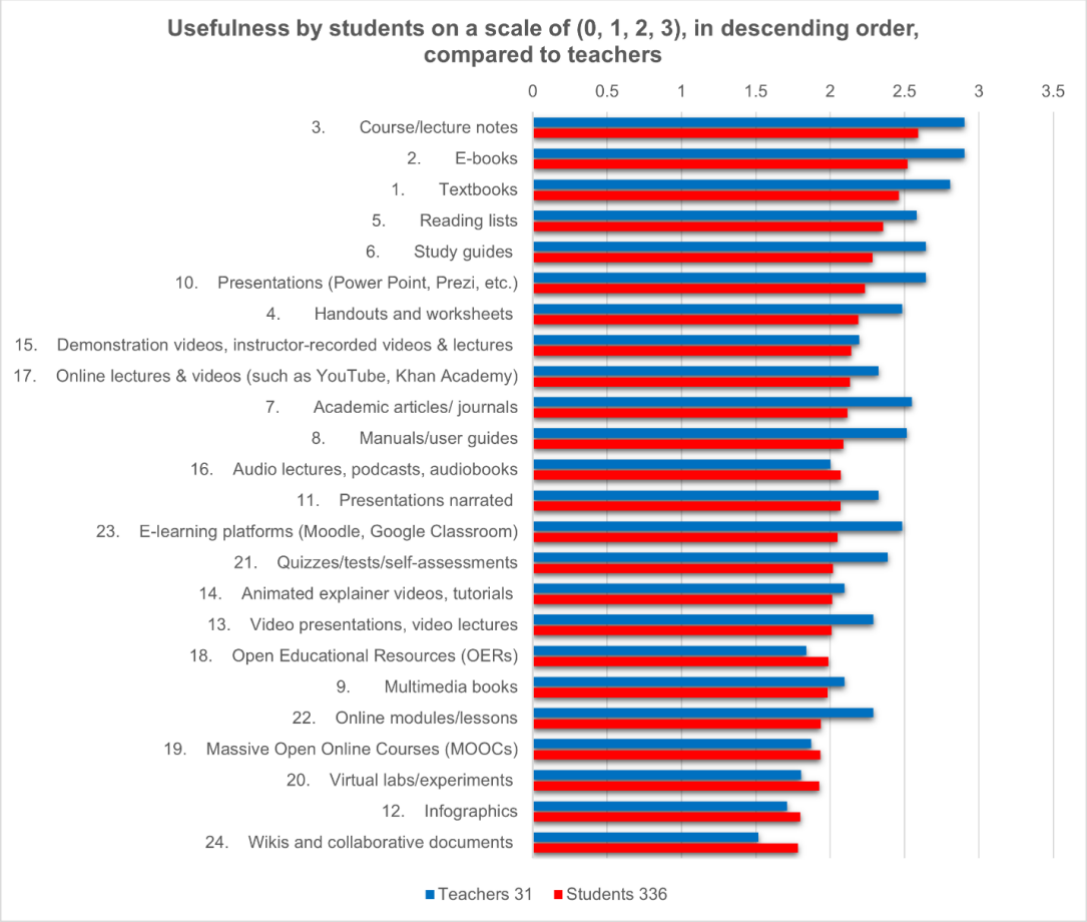

Image 4.2.2. Usefulness by students on a scale of (0, 1, 2, 3), in descending order, compared to teachers

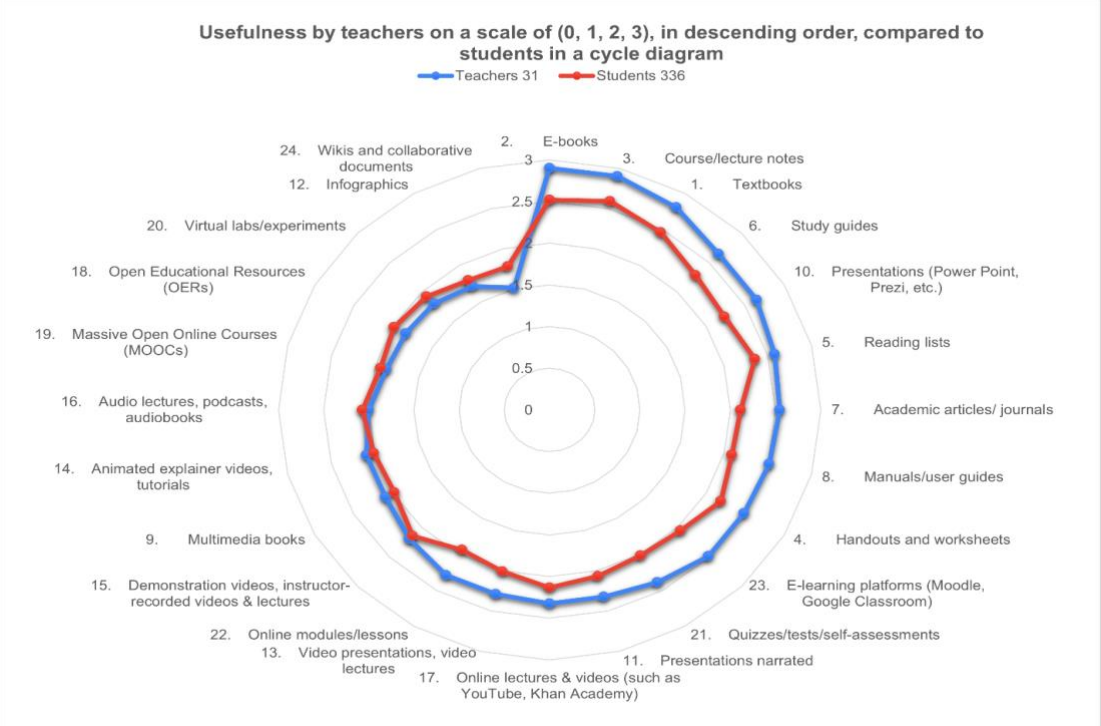

Image 4.2.3. Usefulness by teachers on a scale of (0, 1, 2, 3), in descending order, compared to students in a cycle diagram

Section 5. Main Obstacles to Digital TLA

5.1. Main Obstacles to Digital TLA in HEIs

Top obstacles identified by teachers:

- The most significant obstacle is an underdeveloped digital infrastructure and a lack of necessary equipment (approximately 75% of teachers).
- This is followed by a lack of digital competencies among teachers (~40%).
- Students' insufficient digital competencies are also a significant concern (~45%).
- Another notable barrier is the lack of sufficient digital resources in the Armenian language (~60%).

Students' perspective:

- Students generally report fewer obstacles than teachers but indicate a lack of digital infrastructure and equipment as the most significant barrier (~55%).
- Interestingly, a notable proportion of students (around 35%) find it hard to answer this question, which may indicate a lack of awareness or uncertainty regarding digital obstacles.
- Students report lower percentages of insufficient competencies for both themselves and their teachers compared to teachers' self-assessments.

Comparison and interpretation:

- Teachers perceive the challenges more acutely, especially around digital skills (both their own and students') and infrastructure.
- The language barrier (lack of resources in Armenian) is a significant issue for teachers but somewhat less recognized by students.
- The gap indicates a need for institutional focus on upgrading infrastructure, equipment, and localized content.
- The students' uncertainty highlights a need for clearer communication and engagement about digital challenges.

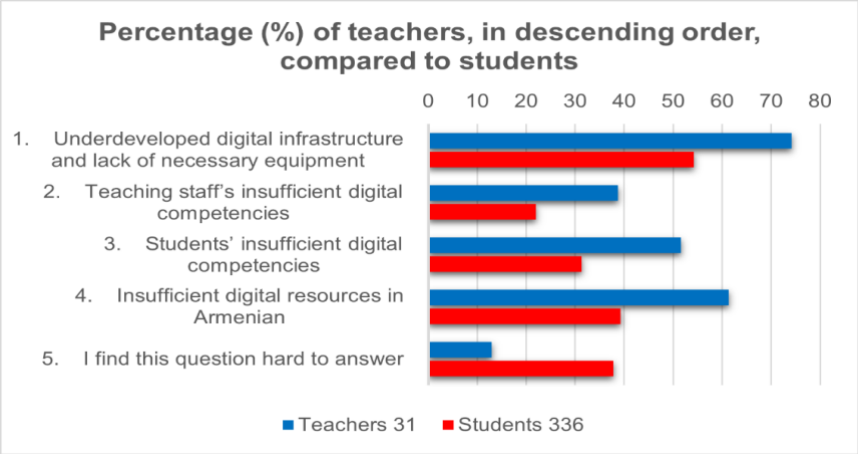

Image 5.1. Percentage (%) of teachers, in descending order, compared to students

5.2. Teachers' Previous Participation in the Training on Digital TLA

Key Findings

- Only 32.3% of teachers have participated in retraining or training programs related to digital teaching, learning, and assessment (TLA).
- The vast majority, 67.7%, have not undergone any digital TLA training.

Implications

- There is a clear need to expand professional development opportunities to upskill teachers in digital competencies.
- The low participation rate could contribute to the perceived lack of digital skills among teachers identified in 5.1.
- Increasing access to and encouragement for training is critical for improving digital pedagogy and technology use.

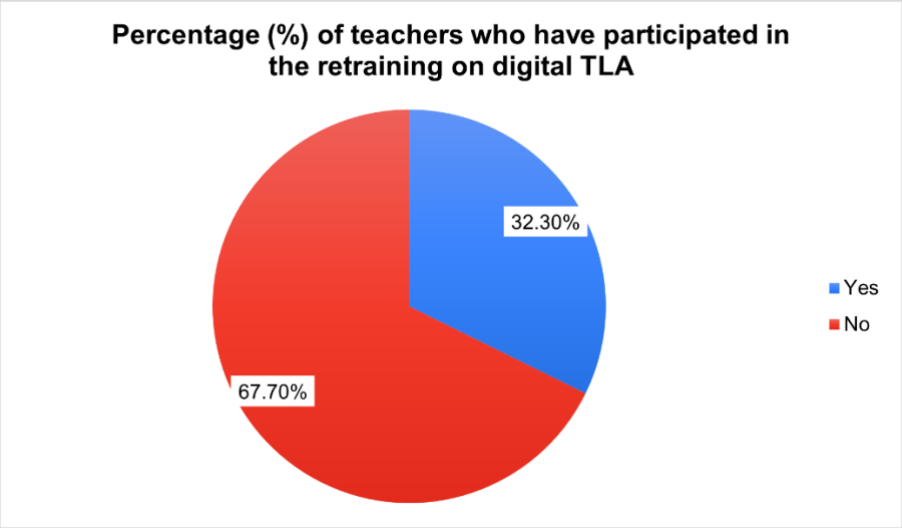

Image 5.2. Percentage (%) of teachers who have participated in the retraining on digital TLA

5.3. Main Topics of Teachers' Previous Training on Digital TLA

Top training topics reported

- Learning Management Systems (LMS)
- Creating Educational Materials
- Interactive Digital Tools (Quizzes, Online Assessment Tools)
- Use of Multimedia in Teaching
- Digital Communication Tools (e.g., Virtual Classrooms, Video Conferencing)
- Basic Digital Skills and Software Training
- Online Course Design and Delivery
- Digital Pedagogical Methods

Analysis

- The training topics cover foundational digital teaching tools and essential pedagogical approaches.
- LMS training is the most common, reflecting the institutional emphasis on platform use.
- There is also an emphasis on content creation and assessment technologies, aligning with the needs of blended or online teaching.
- However, more advanced or emerging technologies like AI tools, VR/AR, and accessibility-focused training appear to be less represented.

Recommendations

- Expand training offerings to include emerging digital technologies and inclusive teaching practices.
- Provide targeted professional development to address digital competency gaps identified in section 5.1.
- Encourage continuous training participation by addressing barriers and incentivizing skill development.

Summary

- Obstacles: Main barriers are infrastructure deficits, insufficient teacher and student digital skills, and lack of localized digital resources.
- Training Participation: Currently low among teachers, highlighting the need for increased training efforts.
- Training Topics: Focus mainly on LMS, educational content creation, interactive tools, and digital communication; opportunity exists to broaden scope.

This analysis suggests that the institution should prioritize investments in digital infrastructure, expand localized content, and scale up professional development with a focus on practical digital pedagogy and emerging technologies to enhance teaching and learning outcomes.

Section 6: Additional Information Provided by Teachers and Students

6.1. Teachers' Responses

The teachers' responses emphasize the importance of training and retraining courses especially those that are aimed at integrating the new technologies into the content of TLA. They also wish to learn how to redesign courses so as to utilize the new technologies in the most efficient way.

6.2. Students' Responses

Around 5% of the students emphasized the importance of integrating new equipment into the content of teaching and learning. Around 3% stated that students need training courses on digital technologies, and another 2.5% of the respondents wish to take intensive classes in new technologies to learn how to benefit from diverse platforms and

resources. 3 % of students' responses focus on the development of more flexible learning models that combine hybrid and face-to-face learning. Approximately the same number of students emphasized the importance of assessing their knowledge, skills, and competencies using online tests. Still, they wish these tests were more reflective and better suited to evaluate their actual abilities. Around 2.5% suggested that teachers use gamification and other teaching methods to enhance the interactive aspect of classes, as these methods significantly increase their interest in the educational process. The same proportion of students recommended integrating digital tools (audiovisual), in our case, which will improve the inclusivity of the learning process at the university. Around 2 % of students wished to take another programme at our university, entirely online, from another country. Finally, even though all our students can benefit from the centralized library services and benefit from the national library resources, around 2.5 % mentioned it as a wish, which shows that they are not very much informed about the current state of things at the university.

Conclusions and Recommendations

1. Both students and teachers identify a high need for improved digital teaching, learning and assessment (TLA).

- Teachers prioritize competencies related to digital content creation and professional development.
- Students seek more interactive, inclusive, and self-paced digital learning experiences.
- There is a misalignment between teacher-reported practices and student-perceived impact.

2. The analysis of feedback from teachers and students at Northern University reveals a clear gap between available digital technologies and their practical, inclusive use in teaching and learning. While some foundational tools (e.g., smartphones, Learning Management Systems, projectors) are well-integrated, more advanced or inclusive technologies are either underutilized or inaccessible to students. We have revealed the following obstacles:

- Over-reliance on basic technologies (e.g., smartphones, printers).
- Limited use and low student awareness of advanced platforms like virtual classrooms, AI tools, or interactive content systems.
- Underdeveloped infrastructure for hybrid learning and accessibility.
- Current facilities do not fully meet students' preferences for multimedia and communication tools.

3. The needs analysis reveals that while traditional resources, such as textbooks, lecture notes, and e-books, remain central to teaching and learning, both students and teachers express a growing demand for more engaging, interactive, and inclusive digital materials. There is also a gap between teacher-prepared content and student usage patterns, especially concerning multimedia, collaborative tools, and flexible learning formats.

4. Strategies for addressing the barriers and obstacles that hinder the advancement of digital teaching, learning, and assessment in your university.

- Strengthen Digital Infrastructure and Equipment Access
- Expand and Incentivize Training for Teachers
- Promote Accessibility and Inclusive Education
- Encourage Innovation by Developing and Implementing New Digital Learning Models (Hybrid Mode, Blended Mode, etc)

5. The feedback gathered from both teachers and students at Northern University reveals a strong commitment to improving digital teaching, learning, and assessment (TLA), while also highlighting several persistent challenges:

- Teachers and students agree on the central role of Learning Management Systems (LMS) and smartphones in supporting digital education.
- Students place greater value on real-time communication tools and accessibility features, indicating a demand for more interactive and inclusive digital learning environments.
- While emerging technologies (e.g., AI tools, VR, speech-to-text) are underused, they are seen as promising opportunities for future innovation in teaching.
- Teachers generally rate digital tools as more useful than students, likely reflecting their greater familiarity, training, and responsibility in content delivery.
- A significant portion of students appear uncertain about digital obstacles, pointing to a gap in awareness, training, or communication.
- Only 32.3% of teachers have participated in digital TLA training, contributing to the widespread perception of skill gaps.
- Current training efforts focus on basic tools and pedagogy, but do not yet cover advanced technologies or inclusive teaching practices.
- Both students and teachers have emphasized the need for updated infrastructure, localized digital content, and more effective training strategies.

Recommendations

Invest in Infrastructure and Device Access

- Upgrade internet, classroom tech, and university-wide connectivity.
- Launch a digital device lending program for students and staff lacking access to essential tools.

Broaden and Improve Teacher Training Pathways

- Offer tiered digital training covering:
- New technologies (AI, VR, adaptive tools)
- Inclusive pedagogy and accessibility practices (e.g., Universal Design for Learning)

- Hybrid and flexible course design
- Link training to real teaching needs (e.g., course redesign, practical applications).
- Incentivize participation through certifications, recognition, and peer mentoring.

Support Student Digital Readiness

- Provide onboarding workshops or modules to improve digital literacy, especially in navigating LMS, communication tools, and collaborative platforms.
- Foster peer-to-peer support systems and create short, student-friendly guides to underutilized tools.

Integrate Communication and Accessibility Tools into Teaching

- Encourage use of chat functions, forums, and real-time feedback in courses to align with student preferences.
- Invest in speech-to-text, text-to-speech, and inclusive digital formats for teaching materials.

Develop High-Quality, Localized Digital Content

- Support teachers in creating Armenian-language materials tailored to the curriculum.
- Expand use of multimedia resources, gamified learning modules, and collaborative activities.

Promote Emerging Technology Use through Pilot Projects

- Identify subjects or courses suitable for innovation and pilot the use of AI-driven tools, VR simulations, or automated feedback systems.

Improve Awareness and Communication

- Increase visibility of existing digital resources (e.g., national library services, online tools).
- Regularly collect feedback from students and teachers to refine tools and strategies.

Summary

To ensure a successful digital transformation at Northern University, the institution must adopt a comprehensive, inclusive, and practical approach **-** upgrading infrastructure, broadening training, aligning tools with real classroom needs, and enhancing accessibility and communication. Only through this coordinated effort will the university be able to foster a digitally empowered learning environment that supports academic excellence, bridges skill gaps, and meets the evolving needs of both students and educators in a sustainable and future-ready way.

Appendix: Temperature Map Analysis of Response Patterns

Analysis of Teacher and Student Responses

For questions 2.2, 3.2, and 4.2, temperature maps have been generated and analyzed to reveal deeper insights into the response patterns of both teaching staff and students.

This visualization approach reveals nuanced patterns that might otherwise remain hidden in conventional data analysis.

Response Reliability Assessment

The analytical methodology includes calculation of relative response reliability for each participant group. This metric accounts for response bias by adjusting for instances where respondents selected identical options across multiple items - a pattern that may indicate disengagement rather than authentic responses.

Comparative Results

The reliability findings for both respondent groups appear in Figures 2.2, 3.2, and 4.2. The table below summarizes these results, presenting the percentage of responses deemed reliable after applying the uniform-response adjustment algorithm. These percentages reflect the proportion of responses that demonstrate meaningful engagement with the questions, after filtering out potentially automated or disengaged response patterns.

Question ID	Teaching Staff	Students
2.2	83.9 %	74.7 %
3.2	90.3 %	71.7 %
4.2	93.5 %	70.8 %

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2.2. Level of need for developing the digital competencies and technologies

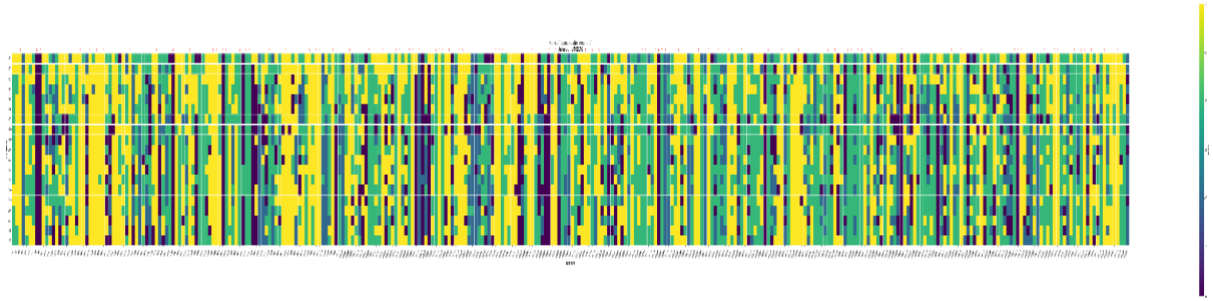

Fig. 2.2.1: Students responses

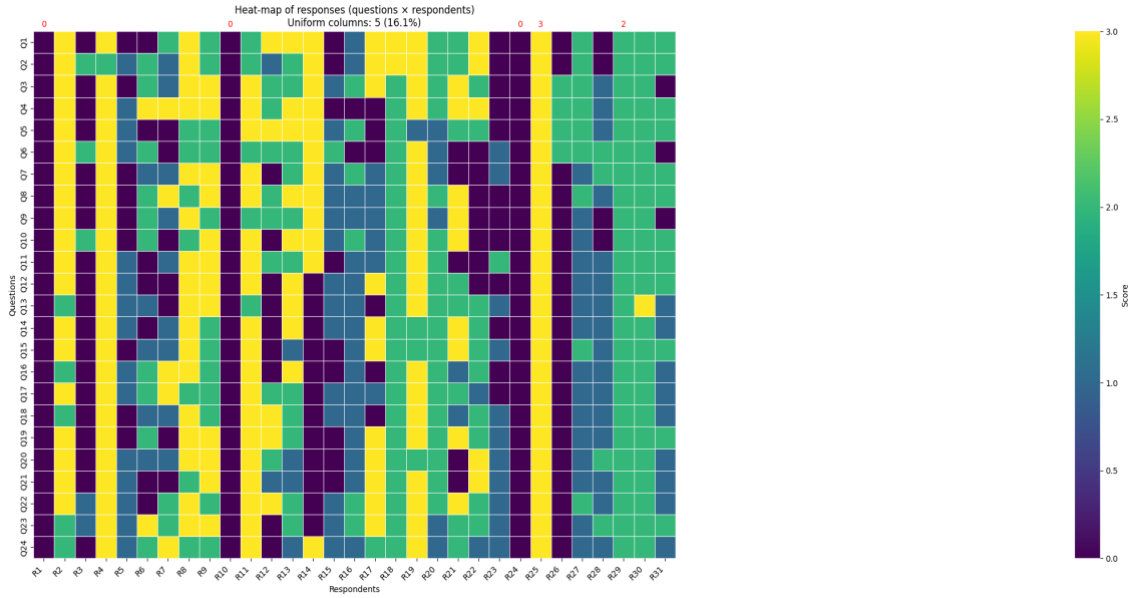

Fig. 2.2.2: Teachers responses

3.2. Usefulness of the technologies & facilities supporting digital TLA

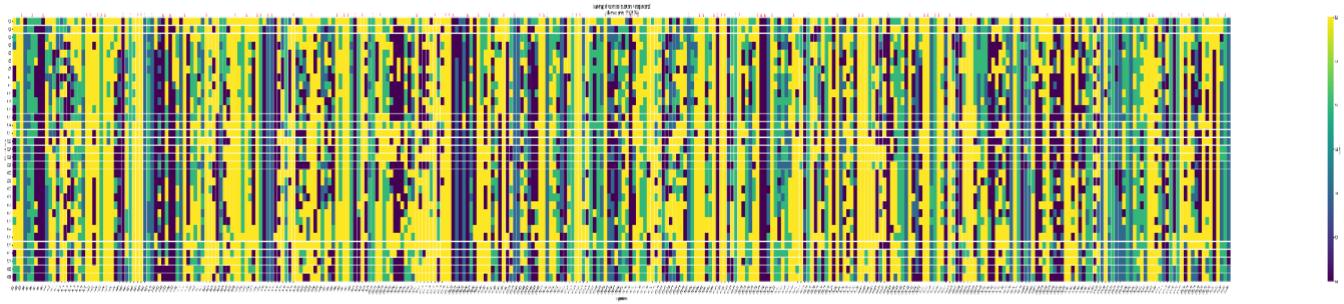

Fig. 3.2.1: Students responses

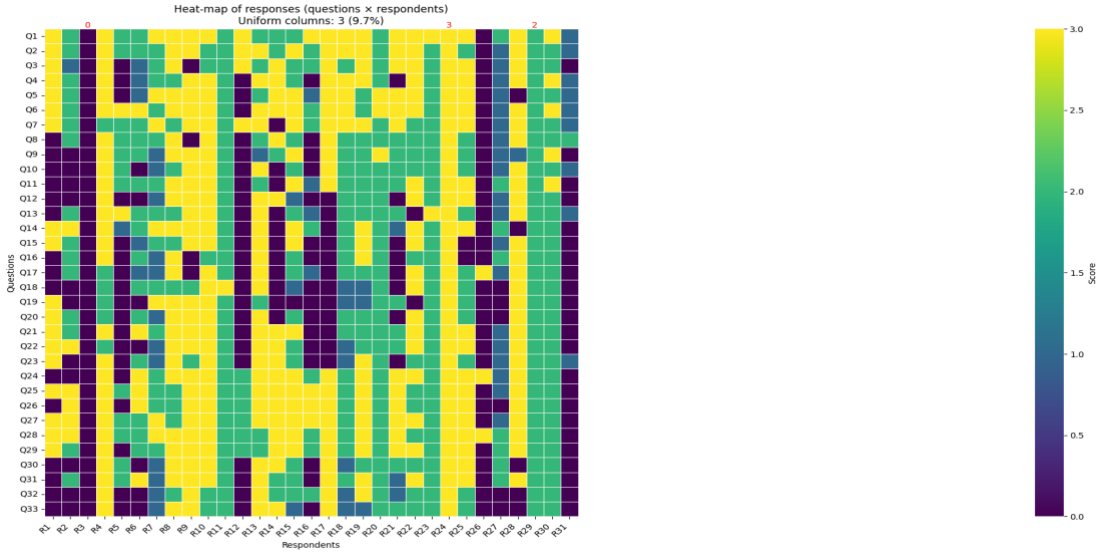

Fig. 3.2.2: Teachers responses

4.2. Usefulness of the study materials for TLA

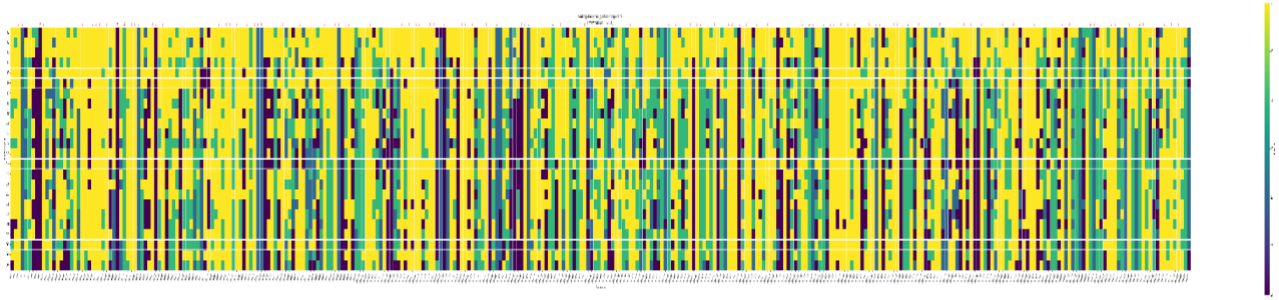

Fig 4.2.1: Students responses

Fig 4.2.2: Teachers responses

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