ENLIVEN

REQUIREMENT ANALYSIS

Report on the online survey: Assessing the International Digital Learning Environments

Co-funded by the Erasmus+ Programme of the European Union

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ENHANCED LEARNING AND TEACHING IN INTERNATIONAL VIRTUAL ENVIRONMENTS

Intellectual Outputs 3: Guidelines for creating inclusive international learning environments

Task A1: Requirement analysis

Content

Report on the online survey – Assessing the International Digital Learning Environments

Report on the survey

A. About the project

The ENLIVEN project aims to develop foundations for an innovative international digital learning environment. Nowadays, there is a pressing need to combine traditional – in presence – education with other forms of teaching and learning to support the modernization of education. In particular, online education presents limitations and opportunities that can be recognized, mitigated, built upon, and used to take advantage of their positive aspects given present and future needs.

The project partners, a consortium of six universities from all over Europe, are committed to improving and enriching existing distance learning practices. Building on the experiences of e-learning during the first phase of the pandemic, the project's mission is to create new stimulating experiences for all the actors involved, incrementing the levels of participation and inclusion in virtual classrooms, thus making virtual mobility closer to physical mobility. By creating an enhanced virtual international learning environment, we aim to deepen the collaboration with European partners.

B. Intellectual Output 3

Intellectual Output 3 is to create and disseminate in publicly accessible form guidelines on enabling and organizing international digital learning environments.

These virtual and blended environments will include courses to prepare for an international experience, thus permitting rich interaction with the host institution, city, and country. They will consist of modules on European cultural competences accessible by learners of all kinds and enable innovative solutions like carrying out practical activities in university laboratories. The intellectual outcome has an excellent transferability potential as it could be adopted by any university that wishes to provide digital learning beyond simple online lessons.

The activities planned for producing the guidelines are composed of the following steps: first, an analysis will be performed of the surveys already carried out during the pandemic and new jointly designed ones to map and understand the main difficulties met by students and teachers in current virtual environments and define a set of requirements to create optimal virtual environments; with the help of experts in psychology and communication, possible solutions and strategies will be designed to facilitate the virtual integration of mobile students; in particular we will focus on practical online activities outside of a physical laboratory for disciplines such as computer science, physics and health sciences, proposing and testing solutions for their efficacy; nano-modules will be offered to promote European values, citizenship and history, and engage students in a virtual interchange leading to a reflection on European diversity and unity; the solutions proposed will be tested in all partner universities to verify their effectiveness; as a final outcome of this process, we will define a set of guidelines, based on a formal model, on how to improve the perception of the classroom climate and university life, but also to assess the risks of failures and actions to mitigate their effects.

C. Demographic characteristics

From September 15, 2021, until December 15, 2021, 1286 respondents participated in the survey. The majority are students (84.7%), while the rest are teachers (15.3%). When talking about gender, people identified themselves as male (39.7%), female (58.9%), or chose not to disclose (1.4%). Regarding age, the examinees are coming from different age groups – less than 20 (12.37%), between 21 and 30 (58.68%), between 31 and 40 (10.35%), between 41 and 50 (7.55%), and more than 50 (11.05%). Also, they come from different countries – Italy (80.1%), Estonia (1.8%), Serbia (9.1%), and Portugal (9.0%).

When it comes to the academic field, the diversity is broad. Most people are coming from the fields of Mathematics and informatics (12.30%), Medicine (10.97%), Industrial and information

engineering (14.70%), and Archeology, philosophy, literary studies, and art history (12.06%). Other fields are Physics (3.74%), Chemistry (3.50%), Earth sciences (1.57%), Biology (5.29%), Agricultural and veterinary sciences (5.14%), Civil engineering and architecture (3.11%), History, philosophy, pedagogy and psychology (6.85%), Law studies (5.60%), Economics and statistics (8.56%), Political and social sciences (5.91%) and Sport and Physical Education (0.7%).

D. Digital environment

The topic of the Digital environment started with a question regarding the years of experience using digital learning environments. The examinees said they did not have previous experience (4.75%), they had less than a year of experience (10.35%), they had between 1 and 3 years of experience (64.20%), or more than three years of experience (20.79%).

The average use of digital learning environments daily was less than 1 hour (6.85%), between 1 and 3 hours (26.00%), between 3 and 5 hours (36.34%), between 5 and 7 hours (24.51%), or more than 7 hours (6.30%).

E. Traveling to the University

The majority of examinees said they do not live in the same large area where the University is situated (54.16%), while the others said they are (45.84%).

The time varies regarding the time spent commuting a.k.a. reaching the University. The majority spends less than 30 minutes (39.30%) or from 30 to 60 minutes (30.89%), while the others spend from 1 hour to 1 hour and a half (14.01%), from 1 hour and a half to 2 hours (5.53%) or over 2 hours (10.27%).

F. The academic year 2020/21

The survey covered mobility, online classes, and the format of attended courses in the academic year 2020/21.

The majority said they have not been on mobility in this academic year (90.74%), while the others have (9.26%). Regarding the percentage of attended online classes, people had none (2.96%), less than 25% (5.06%), between 25 and 50% (8.48%), between 51 and 75% (13.23%), or more than 75% (70.27) classes attended online. The format of attended courses was entirely in-person (1.17%), altogether online (78.38%), or hybrid, which means partly online, partly in-person (20,47%).

G. Infrastructure, tools, and resources

When it comes to learning platforms, the examinees used Moodle (68.20%), OpenOLAT (0.40%), CommSy (0.20%), Canvas (7.10%), Blackboard (3.30%), Other (0.70%) or did not use them at all (20.10%).

As for videoconference systems, the survey gathered 2265 answers. The majority said they use MS Teams (50.70%), Google Classroom (19.6%), or Zoom (18.90%), while the others said they use Webex (3.80%), BigBlueButton (3.10%), Hangouts (2.3%), or other platforms (1.6%).

For types of authoring tools, the survey gathered 2290 answers – for audio recordings (18.43%), for video recordings (33.58%), for presentation recordings (16.38%), for task/test/quiz preparation (17.51%) or did not use any of authoring tools (14.10%).

The topic of types of tools for engagement had 1363 answers. The majority said they did not use any of the tools for engagement (73.30%). The others said they used Lecture2Go (0.60%), Examination software (0.90%), Polling software (1.80%), Mentimeter (3.90%), Kahoot (10.50%), Miro (3.40%), Mural (0.60%), Padlet (2.50%), Flipgrip (0.40%), Edpuzzle (0.70%) or Other platforms (1.50%).

Regarding the type of communication with students/teachers during the academic year 2020/21, it had 3122 answers. It was in person (7.01%), via email (35.97%), via telephone (10.89%), via blogs, forums, etc. (3.01%), via videoconferences (24.59%), via messenger, chat, social media (17.49%), other (0.16%) or did not communicate with fellow students/teachers (0.58%).

The distribution of digital devices is desktop computer (8.47%), laptop (30.34%), tablet (10.91%), smartphone (24.47%), printer (14.47%), and scanner (11.32%), while some did not use any of digital devices (0.03%), according to 3932 answers.

Most examinees have Internet access (98.52%) while the others do not have (1.48%). Talking about Internet connection being sufficiently stable and fast enough to participate in digital learning, some said it was never or rarely stable and fast enough (1.33%), mostly not (3.67%), sometimes (8.84%) or preferred not to say (0.16%), while the majority said it was mostly (58.41%) or always stable and fast enough (27.60%).

Also, most examinees said they have a webcam and a microphone (97.12%), while the others do not (2.88%).

When it comes to a quiet place to teach/study at current residence, most of them have a quiet place (83.19%), while others do not (13.39%) or prefer not to say (3.42%).

H. Available support for teaching/learning

The survey also covered the topic of support when it comes to digital learning.

In the transition from in-presence to distance learning, the University's support was received by 72.84% of examinees, while 27.16% did not receive support. Kinds of training and support received were written information on the website (32.31%), informative e-mails (40.48%), video tutorials on the use of platforms (11.96%), online training (5.65%), or technical support/help desk (9.59%).

While rating experience in employing the available platform for distance learning, several topics were covered. The five-point Likert scale was used (1 – very difficult, 2 – difficult, 3 – neither difficult nor easy, 4 – easy, 5 – very easy). Rating of access to the platform has an average grade of 4.15 (1 – 1%, 2 – 5%, 3 – 16%, 4 – 35%, 5 – 43%). The average grade for using the webcam/microphone is 4.16 (1 – 2%, 2 – 5%, 3 – 16%, 4 – 28%, 5 – 48%). Sharing the screen got graded with 3.94 as an average grade (1 – 2%, 2 – 7%, 3 – 21%, 4 – 33%, 5 – 36%). The average grade for identification of the platform features is 3.62 (1 – 6%, 2 – 11%, 3 – 30%, 4 – 32%, 5 – 24%). Use of chat or comment area, questions got graded with 4.08 as an average grade (1 – 2%, 2 – 7%, 3 – 16%, 4 – 33%, 5 – 42%). Lastly, exchange

of materials (PPT, PDF, DOCX, XLSX, etc.) got an average grade of 3.88 (1 – 3%, 2 – 8%, 3 – 22%, 4 – 34%, 5 – 34%).

I. Digital competencies

When asked to rate, on a scale from 1 to 5 (1 – strongly disagree, 2 – disagree, 3 – I neither agree nor disagree, 4 – I agree, 5 – I strongly agree), if they had enough technical knowledge to compile necessary teaching materials in different formats (text, presentation, video), 2% of examinees graded their knowledge with 1, 5% with 2, 16% with 3, 33% with 4, and 45% with 5.

On the same scale, the examinees rated how they solved technical problems during distance learning – 2% with 1, 5% with 2, 19% with 3, 36% with 4, and 37% with 5. Rating of "My digital competencies were sufficient to deliver/attend distance learning efficiently" is similar – 1% with 1, 4% with 2, 12% with 3, 31% with 4, and 53% with 5.

J. Teaching/Learning methods

Several methods used for guiding distance learning gathered 3294 answers in total. Live (streaming) lessons that were recorded to make them available later are the most common, with 28.32%. Next is live (streaming) lessons that have not been recorded with 23.04%. Other options are teaching materials (slides, PDFs, handouts, etc.) without audio commentary with 18.52%, teaching materials (slides, PDFs, handouts, etc.) with video commentary with 12.57%, recorded lessons with audio (5.98%), and recorded lessons with video (11.57%).

When talking about the change of teaching/learning methods, 1335 answers were gathered. The majority said they changed the content and structure a bit to fit the online mode (43.30%), while the others said they took the opportunity to considerably rethink their teaching/learning (27.71%) or they did not change the content or the structure of their teaching/learning (28.99%).

When the topic of delivered/taken online assessment was discussed, there were 1324 answers in total. Both formative and summative assessments were used by 53.85 examinees, only formative by 21.07%, only summative by 7.25%, and 17.82% did not use online assessment – assessment was done at the University.

The format used for online assessment gathered 2600 answers in total – oral examination as a videoconference with 35.65%, presentation examination as a videoconference with 9.30%, written take-home examination with 22.08%, digital submission of a term paper with 9.77%, online quiz via learning platform with 23.12%, and other with 0.08%.

Main critical issues that have changed teaching during the pandemic that were identified by 5050 answers are considerable increase in working time (7.62%), dispersal of information (7.01%), difficulties in the overall organization of work and in distance teaching activities (8.93%), increased stress and physical fatigue (9.96%), increase in the number of absences and lack of participation (7.74%), increase in cases of discomfort (5.01%), difficulty in guaranteeing assistance and educational support to persons with disabilities (3.11%), increased difficulty in understanding what was explained/assigned (7.45%), digital divide/IT issues (10.85%), difficulty in raising the sense of belonging through distance learning, gained by participation, empathy, and effective communication (15.13%), difficulties in delivering/attending "practical" subjects/laboratories through distance

teaching/learning (12.55%), economic impact of distance learning for teachers and students (2.77%), and other (1.86%).

When rating satisfaction in using digital platforms, the scale from 1 to 5 (1 – strongly disagree, 2 – disagree, 3 – I neither agree nor disagree, 4 – I agree, 5 – I strongly agree) was used. Satisfaction with the University digital platforms got an average grade of 3.83 (1 – 3%, 2 – 8%, 3 – 21%, 4 – 37%, 5 – 31%), "the use of the University digital platforms makes the courses more interesting" got an average grade of 2.85 (1 – 20%, 2 – 22%, 3 – 27%, 4 – 15%, 5 – 16%), and "I would recommend the University digital platforms to others" got graded with 3.41 (1 – 1%, 2 – 12%, 3 – 28%, 4 – 27%, 5 – 23%), while "I would like future courses to be on the University digital platforms" got the average grade of 2.96 (1 – 25%, 2 – 17%, 3 – 20%, 4 – 13%, 5 – 25%), and the overall impression that the University digital platforms are great got graded with 3.38 as an average grade (1 – 1%, 2 – 14%, 3 – 28%, 4 – 18%, 5 – 22%).

1. Demographic characteristics

The majority are students (84.7%), while the rest are teachers (15.3%).

Table 1: Distribution of roles

Role	Sample	
n = 1286	n	%
Student	1089	84.7%
Teacher	197	15.3%

When talking about gender, people identified themselves as male (39.7%), female (58.9%), or chose not to disclose (1.4%).

Table 2: Distribution of gender

Gender	Sample	
n = 1286	n	%
Male	510	39.7%
Female	758	58.9%
Prefer not to disclose	18	1.4%

Regarding age, the examinees are coming from different age groups – less than 20 (12.37%), between 21 and 30 (58.68%), between 31 and 40 (10.35%), between 41 and 50 (7.55%), and more than 50 (11.05%).

Table 3: Distribution of age

Age	Sample	
n = 1285	n	%
Less than 20	159	12.37%
Between 21 and 30	754	58.68%
Between 31 and 40	133	10.35%
Between 41 and 50	97	7.55%
More than 50	142	11.05%

Also, they come from different countries – Italy (80.1%), Estonia (1.8%), Serbia (9.1%), and Portugal (9.0%).

Table 4: Distribution of country

Country	Sample	
n = 1286	n	%
Italy	1030	80.1%
Estonia	23	1.8%
Serbia	117	9.1%
Portugal	116	9.0%

When it comes to the academic field, the diversity is broad. Most people are coming from the fields of Mathematics and informatics (12.30%), Medicine (10.97%), Industrial and information engineering (14.70%), and Archeology, philosophy, literary studies, and art history (12.06%). Other fields are Physics (3.74%), Chemistry (3.50%), Earth sciences (1.57%), Biology (5.29%), Agricultural and veterinary sciences (5.14%), Civil engineering and architecture (3.11%), History, philosophy, pedagogy and psychology (6.85%), Law studies (5.60%), Economics and statistics (8.56%), Political and social sciences (5.91%) and Sport and Physical Education (0.7%).

Table 5: Distribution of academic field

Academic field n = 1285	Sample n	%
Mathematics and informatics	158	12.30%
Physics	48	3.74%
Chemistry	45	3.50%
Earth sciences	20	1.57%
Biology	68	5.29%
Medicine	141	10.97%
Agricultural and veterinary sciences	66	5.14%
Civil engineering and architecture	40	3.11%
Industrial and information engineering	189	14.70%
Archeology, philology, literary studies, art history	155	12.06%
History, philosophy, pedagogy and psychology	88	6.85%
Law studies	72	5.60%
Economics and statistics	110	8.56%
Political and social sciences	76	5.91%
Sport and Physical Education	9	0.7 %

2. Digital environment

The topic of the Digital environment started with a question regarding the years of experience using digital learning environments. The examinees said they did not have previous experience (4.75%), they had less than a year of experience (10.35%), they had between 1 and 3 years of experience (64.20%), or more than three years of experience (20.79%).

Table 6: Years of experience

Years of experience using digital learning environments n = 1285	Sample n	%
I have no previous experience	61	4.75%
Less than a year	133	10.35%
Between 1 and 3 years	825	64.20%
More than 3 years	267	20.79%

The average use of digital learning environments daily was less than 1 hour (6.85%), between 1 and 3 hours (26.00%), between 3 and 5 hours (36.34%), between 5 and 7 hours (24.51%), or more than 7 hours (6.30%).

Table 7: Average use on a daily basis

Average use of digital learning environments on a daily basis	Sample	
n = 1285	n	%
Less than 1h	88	6.85%
Between 1h and 3h	334	26.00%
Between 3h and 5h	467	36.34%
Between 5h and 7h	315	24.51%
More than 7h	81	6.30%

3. Travelling to the University

The majority of examinees said they do not live in the same large area where the University is situated (54.16%), while the others said they are (45.84%).

Table 8: Place of living

Living in the same large area in which the University is situated	Sample	
n = 1285	n	%
Yes	589	45.84%
No	696	54.16%

The time varies regarding the time spent commuting a.k.a. reaching the University. The majority spends less than 30 minutes (39.30%) or from 30 to 60 minutes (30.89%), while the others spend from 1 hour to 1 hour and a half (14.01%), from 1 hour and a half to 2 hours (5.53%) or over 2 hours (10.27%).

Table 9: Average time spent travelling

Average time spent reaching the University	Sample	
n = 1285	n	%
Less than 30 minutes	505	39.30%
From 30 to 60 minutes	397	30.89%
From 1 hour to 1 hour and a half	180	14.01%
From 1 hour and a half to 2 hours	71	5.53%
Over 2 hours	132	10.27%

4. Academic year 2020/21

The survey covered mobility, online classes, and the format of attended courses in the academic year 2020/21. The majority said they have not been on mobility in this academic year (90.74%), while the others have (9.26%).

Table 10: Been on a mobility

Been on a mobility in the academic year 2020/21 n = 1285	Sample n	%
Yes	119	9.26%
No	1166	90.74%

Regarding the percentage of attended online classes, people had none (2.96%), less than 25% (5.06%), between 25 and 50% (8.48%), between 51 and 75% (13.23%), or more than 75% (70.27) classes attended online.

Table 11: Percentage of attended online classes

Percentage of online classes attended in the academic year 2020/21 n = 1285	Sample n	%
None	38	2.96%
Less than 25%	65	5.06%
Between 25 and 50%	109	8.48%
Between 51 and 75%	170	13.23%
More than 75%	903	70.27%

The format of attended courses was entirely in-person (1.17%), altogether online (78.38%), or hybrid, which means partly online, partly in-person (20,47%).

Table 12: Format of courses

Format of attended courses n = 1285	Sample n	%
Entirely in-person attendance	15	1.17%
Entirely online	1007	78.38%
Hybrid (partly online, partly in-person attendance)	263	20.47%

5. Infrastructure, tools and resources

When it comes to learning platforms, the examinees used Moodle (68.20%), OpenOLAT (0.40%), CommSy (0.20%), Canvas (7.10%), Blackboard (3.30%), Other (0.70%) or did not use them at all (20.10%).

Table 13: Type of learning platforms

Learning platforms n = 1286	Sample n	%
Moodle	878	68.20%
OpenOLAT	5	0.40%
CommSy	3	0.20%
Canvas	91	7.10%
Blackboard	43	3.30%
I did not use any of learning platforms	259	20.10%
Other	9	0.70%

As for videoconference systems, the survey gathered 2265 answers. The majority said they use MS Teams (50.70%), Google Classroom (19.6%), or Zoom (18.90%), while the others said they use Webex (3.80%), BigBlueButton (3.10%), Hangouts (2.3%), or other platforms (1.6%).

Table 14: Type of videoconference systems

Videoconference systems n = 2265	Sample n	%
Zoom	427	18.90%
Webex	86	3.80%
BigBlueButton	71	3.10%
MS Teams	1149	50.70%
Google Classroom	444	19.6%
Hangouts	51	2.3%
Other	37	1.6%

For types of authoring tools, the survey gathered 2290 answers – for audio recordings (18.43%), for video recordings (33.58%), for presentation recordings (16.38%), for task/test/quiz preparation (17.51%) or did not use any of authoring tools (14.10%).

Table 15: Type of authoring tools

Authoring tools n = 2290	Sample n	%
For audio recordings	422	18.43%
For video recordings	769	33.58%
For presentation recordings	375	16.38%
For task/test/quiz preparation	401	17.51%
I did not use any of authoring tools	323	14.10%

The topic of types of tools for engagement had 1363 answers. The majority said they did not use any of the tools for engagement (73.30%). The others said they used Lecture2Go (0.60%), Examination software (0.90%), Polling software (1.80%), Mentimeter (3.90%), Kahoot (10.50%), Miro (3.40%), Mural (0.60%), Padlet (2.50%), Flipgrip (0.40%), Edpuzzle (0.70%) or Other platforms (1.50%).

Table 16: Type of tools for engagement

Tools for engagement n = 1363	Sample n	%
Lecture2Go	8	0.60%
Examination software	12	0.90%
Polling software	25	1.80%
Mentimeter	53	3.90%
Kahoot	143	10.50%
Miro	46	3.40%
Mural	8	0.60%
Padlet	34	2.50%
Flipgrip	5	0.40%
Edpuzzle	10	0.70%
I did not use any of tools for engagement	999	73.30%
Other	20	1.50%

Regarding the type of communication with students/teachers during the academic year 2020/21, it had 3122 answers. It was in person (7.01%), via email (35.97%), via telephone (10.89%), via blogs, forums, etc. (3.01%), via videoconferences (24.59%), via messenger, chat, social media (17.49%), other (0.16%) or did not communicate with fellow students/teachers (0.58%).

Table 17: Type of communication

Type of communication with students/teachers during the academic year 2020/21 n = 3122	Sample n	%
In person	219	7.01%
Via email	1123	35.97%
Via telephone	340	10.89%
Via blogs, forums, etc.	94	3.01%
Via videoconferences	777	24.59%
Via messenger, chat, social media	546	17.49%
I did not communicate with fellow students/teachers this semester	18	0.58%
Other	5	0.16%

The distribution of digital devices is desktop computer (8.47%), laptop (30.34%), tablet (10.91%), smartphone (24.47%), printer (14.47%), and scanner (11.32%), while some did not use any of digital devices (0.03%), according to 3932 answers.

Table 18: Distribution of access to digital device

Access to digital device n = 3932	Sample n	%
Desktop computers	333	8.47%
Laptop	1193	30.34%
Tablet	429	10.91%
Smartphone	962	24.47%
Printer	569	14.47%
Scanner	445	11.32%
I did not use any of digital devices	1	0.03%

Most examinees have Internet access (98.52%) while the others do not have (1.48%).

Table 19: Having Internet access

Internet access n = 1285	Sample n	%
Yes	1266	98.52%
No	19	1.48%

Talking about Internet connection being sufficiently stable and fast enough to participate in digital learning, some said it was never or rarely stable and fast enough (1.33%), mostly not (3.67%), sometimes (8.84%) or preferred not to say (0.16%), while the majority said it was mostly (58.41%) or always stable and fast enough (27.60%).

Table 20: Quality of Internet connection

Internet connection sufficiently stable and fast enough to participate in digital learning n = 1279	Sample n	%
Never or almost never	17	1.33%
Mostly not	47	3.67%
Sometimes	113	8.84%
Mostly	747	58.41%
Always	353	27.60%
Prefer not to say	2	0.16%

Also, most examinees said they have a webcam and a microphone (97.12%), while the others do not (2.88%).

Table 21: Having webcam and microphone

Webcam and microphone n = 1285	Sample n	%
Yes	1248	97.12%
No	37	2.88%

When it comes to a quiet place to teach/study at current residence, most of them have a quiet place (83.19%), while others do not (13.39%) or prefer not to say (3.42%).

Table 22: Having a quiet place

A quiet place to teach/study at current residence n = 1285	Sample n	%
Yes	1069	83.19%
No	172	13.39%
Prefer not to say	44	3.42%

6. Available support for teaching/learning

The survey also covered the topic of support when it comes to digital learning.

In the transition from in-presence to distance learning, the University's support was received by 72.84% of examinees, while 27.16% did not receive support.

Table 23: Received support from the University

Received support from the University in the transition from in-presence to distance learning n = 1285	Sample n	%
Yes	936	72.84%
No	349	27.16%

Kinds of training and support received were written information on the website (32.31%), informative e-mails (40.48%), video tutorials on the use of platforms (11.96%), online training (5.65%), or technical support/help desk (9.59%).

Table 24: Training and support received

Kind of training and support received n = 1981	Sample n	%
Written information on the website	640	32.31%
Informative e-mails	802	40.48%
Video tutorial on the use of platforms	237	11.96%
Online training	112	5.65%
Technical support / help desk	190	9.59%

While rating experience in employing the available platform for distance learning, several topics were covered. The five-point Likert scale was used (1 – very difficult, 2 – difficult, 3 – neither difficult nor easy, 4 – easy, 5 – very easy). Rating of access to the platform has an average grade of 4.15 (1 – 1%, 2 – 5%, 3 – 16%, 4 – 35%, 5 – 43%). The average grade for using the webcam/microphone is 4.16 (1 – 2%, 2 – 5%, 3 – 16%, 4 – 28%, 5 – 48%). Sharing the screen got graded with 3.94 as an average grade (1 – 2%, 2 – 7%, 3 – 21%, 4 – 33%, 5 – 36%). The average grade for identification of the platform features is 3.62 (1 – 6%, 2 – 11%, 3 – 30%, 4 – 32%, 5 – 24%). Use of chat or comment area, questions

got graded with 4.08 as an average grade (1 – 2%, 2 – 7%, 3 – 16%, 4 – 33%, 5 – 42%). Lastly, exchange of materials (PPT, PDF, DOCX, XLSX, etc.) got an average grade of 3.88 (1 – 3%, 2 – 8%, 3 – 22%, 4 – 34%, 5 – 34%).

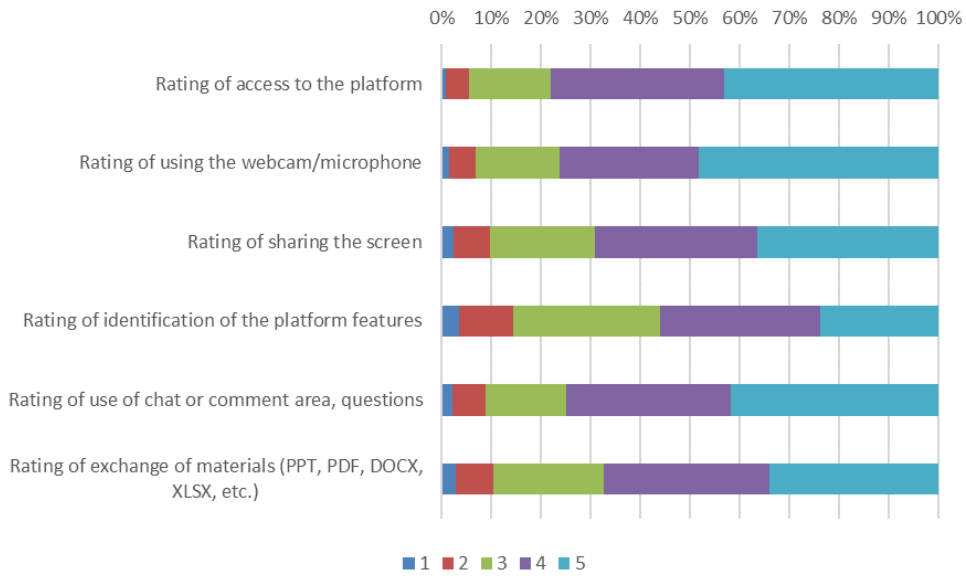

Figure 1: Rating of experience in employing the available platform for distance learning

7. Digital competencies

When asked to rate, on a scale from 1 to 5 (1 – strongly disagree, 2 – disagree, 3 – I neither agree nor disagree, 4 – I agree, 5 – I strongly agree), if they had enough technical knowledge to compile necessary teaching materials in different formats (text, presentation, video), 2% of examinees graded their knowledge with 1, 5% with 2, 16% with 3, 33% with 4, and 45% with 5.

On the same scale, the examinees rated how they solved technical problems during distance learning – 2% with 1, 5% with 2, 19% with 3, 36% with 4, and 37% with 5. Rating of "My digital competencies were sufficient to deliver/attend distance learning efficiently" is similar – 1% with 1, 4% with 2, 12% with 3, 31% with 4, and 53% with 5.

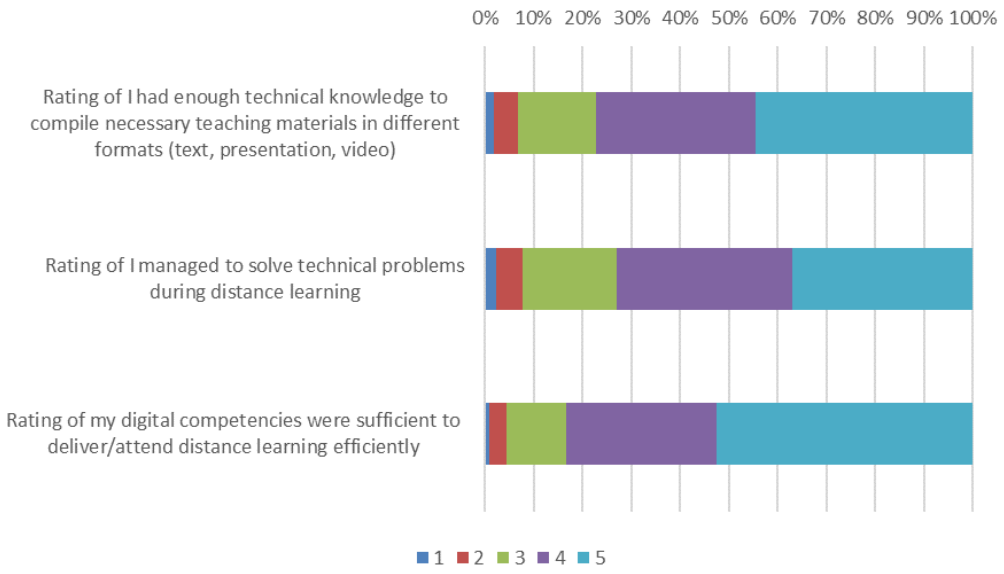

Figure 2: Rating of digital competences in using digital platforms

8. Teaching/Learning methods

Several methods used for guiding distance learning gathered 3294 answers in total. Live (streaming) lessons that were recorded to make them available later are the most common, with 28.32%. Next is live (streaming) lessons that have not been recorded with 23.04%. Other options are teaching materials (slides, PDFs, handouts, etc.) without audio commentary with 18.52%, teaching materials (slides, PDFs, handouts, etc.) with video commentary with 12.57%, recorded lessons with audio (5.98%), and recorded lessons with video (11.57%).

Table 25: Type of methods for guiding distance learning

Methods used for guiding distance learning n = 3294	Sample n	%
Teaching materials (slides, PDFs, handouts, etc.) without audio commentary	610	18.52%
Teaching materials (slides, PDFs, handouts, etc.) with video commentary	414	12.57%
Live (streaming) lessons that were recorded to make them available later	933	28.32%
Live (streaming) lessons that have not been recorded	759	23.04%
Recorded lessons with audio	197	5.98%
Recorded lessons with video	381	11.57%

When talking about the change of teaching/learning methods, 1335 answers were gathered. The majority said they changed the content and structure a bit to fit the online mode (43.30%), while the others said they took the opportunity to considerably rethink their teaching/learning (27.71%) or they did not change the content or the structure of their teaching/learning (28.99%).

Table 26: Change of teaching/learning methods

Change of teaching/learning methods n = 1335	Sample n	%
Yes, and I took the opportunity to considerably rethink my teaching/learning	370	27.71%
Yes, I changed the content and structure a bit to fit the online mode	578	43.30%
No, I changed neither the content nor the structure of my teaching/learning	387	28.99%

When the topic of delivered/taken online assessment was discussed, there were 1324 answers in total. Both formative and summative assessments were used by 53.85 examinees, only formative by 21.07%, only summative by 7.25%, and 17.82% did not use online assessment – assessment was done at the University.

Table 27: Type of delivered/taken online assessment

Delivered/taken online assessment n = 1324	Sample n	%
Yes, only formative	279	21.07%
Yes, only summative	96	7.25%
Yes, both formative and summative	713	53.85%
No, I did not use online assessment – assessment was done at the University	236	17.82%

The format used for online assessment gathered 2600 answers in total – oral examination as a videoconference with 35.65%, presentation examination as a videoconference with 9.30%, written take-home examination with 22.08%, digital submission of a term paper with 9.77%, online quiz via learning platform with 23.12%, and other with 0.08%.

Table 28: Format used for online assessment

Format used for online assessment n = 2600	Sample n	%
Oral examination as a videoconference	927	35.65%
Presentation examination as a videoconference	242	9.30%
Written take-home examination	574	22.08%
Digital submission of a term paper	254	9.77%
Online quiz via learning platform	601	23.12%
Other	2	0.08%

Main critical issues that have changed teaching during the pandemic that were identified by 5050 answers are considerable increase in working time (7.62%), dispersal of information (7.01%), difficulties in the overall organization of work and in distance teaching activities (8.93%), increased stress and physical fatigue (9.96%), increase in the number of absences and lack of participation (7.74%), increase in cases of discomfort (5.01%), difficulty in guaranteeing assistance and educational support to persons with disabilities (3.11%), increased difficulty in understanding what was

explained/assigned (7.45%), digital divide/IT issues (10.85%), difficulty in raising the sense of belonging through distance learning, gained by participation, empathy, and effective communication (15.13%), difficulties in delivering/attending "practical" subjects/laboratories through distance teaching/learning (12.55%), economic impact of distance learning for teachers and students (2.77%), and other (1.86%).

Table 29: Type of critical issues that influenced teaching during the pandemic

Main critical issues that have changed teaching during the pandemic n = 5050	Sample n	%
Considerable increase in working time	385	7.62%
Dispersal of information	354	7.01%
Difficulties in the overall organization of work and in distance teaching activities	451	8.93%
Increased stress and physical fatigue	503	9.96%
Increase in the number of absences and lack of participation	391	7.74%
Increase in cases of discomfort	253	5.01%
Difficulty in guaranteeing assistance and educational support to persons with disabilities	157	3.11%
Increased difficulty in understanding what was explained / assigned	376	7.45%
Digital divide / IT issues	548	10.85%
Difficulty in increasing the sense of belonging through distance learning, gained by participation, empathy, and effective communication	764	15.13%
Difficulties in delivering/attending "practical" subjects / laboratories through distance teaching/learning	634	12.55%
Economic impact of distance learning for teachers and students	140	2.77%
Other	94	1.86%

When rating satisfaction in using digital platforms, the scale from 1 to 5 (1 – strongly disagree, 2 – disagree, 3 – I neither agree nor disagree, 4 – I agree, 5 – I strongly agree) was used. Satisfaction with the University digital platforms got an average grade of 3.83 (1 – 3%, 2 – 8%, 3 – 21%, 4 – 37%, 5 – 31%), “the use of the University digital platforms makes the courses more interesting” got an average grade of 2.85 (1 – 20%, 2 – 22%, 3 – 27%, 4 – 15%, 5 – 16%), and “I would recommend the University digital platforms to others” got graded with 3.41 (1 – 1%, 2 – 12%, 3 – 28%, 4 – 27%, 5 – 23%), while “I would like future courses to be on the University digital platforms” got the average grade of 2.96 (1 – 25%, 2 – 17%, 3 – 20%, 4 – 13%, 5 – 25%), and the overall impression that the University digital platforms are great got graded with 3.38 as an average grade (1 – 1%, 2 – 14%, 3 – 28%, 4 – 18%, 5 – 22%).

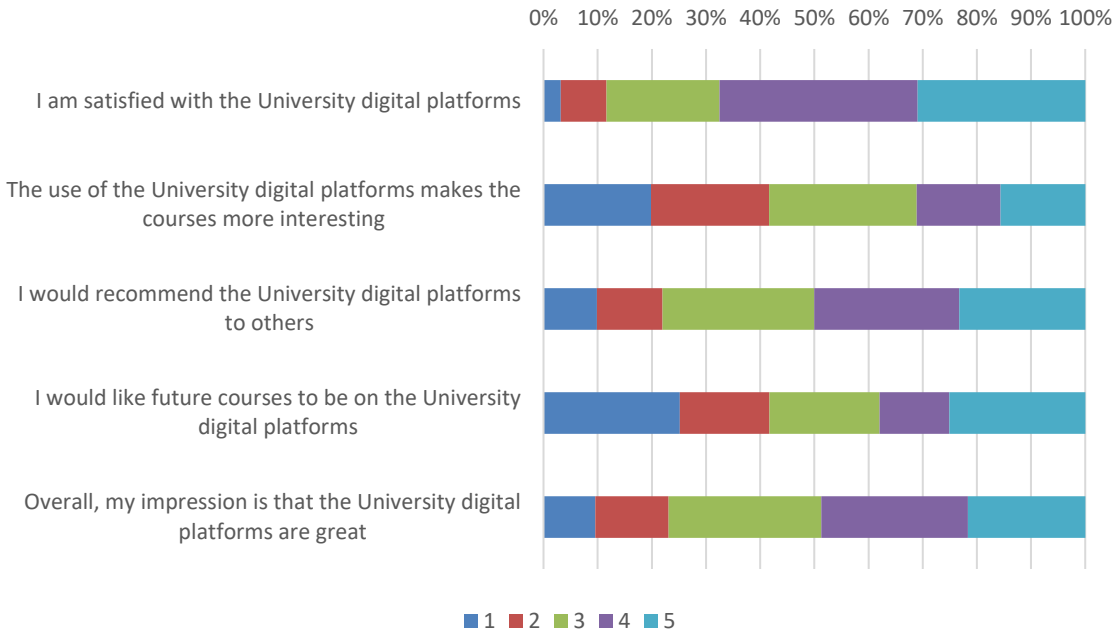

Figure 3: Rating of satisfaction in using digital platforms

REQUIREMENT ANALYSIS OUTPUTS

Based on the requirement analysis following key findings are identified:

- 95% of respondents have experience using digital learning environments
- 60% of respondents need more than 30 minutes to reach the University
- 91% of respondents did not participate in mobility in the academic year 2020/21
- 97% of classes were delivered online in the academic year 2020/21
- Dominant LMS is Moodle (68%); communication platform is MS Teams (51%)
- Only 27% of respondents used tools for engagements
- Almost all the respondents have internet access and a digital device
- 22% of respondents claimed that they do not have enough technical knowledge to compile necessary educational resources
- 29% of respondents did not change the content nor the structure of their teaching/learning
- The main critical issue that has changed teaching during the pandemic is difficulty increasing the sense of belonging through distance learning, gained by participation, empathy, and effective communication (15.13%)

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