HEDforALL: Holistic Approach to Accessible Higher Education

D2.1 Knowledge and Skills of Teaching staff and Accessibility Advisors

ERASMUS+

Project No: 2021-1-EL01-KA220-HED-000032260

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

This project (2021-1-EL01-KA220-HED-000032260) has been co-funded by the Erasmus+ Programme of the European Commission. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

DOCUMENT DESCRIPTION

Funding:	ERASMUS+ Programme
Project website:	www.hedforall.eu
Project Result:	RES2: Knowledge and Skills of Teaching staff and Accessibility Advisors
Task No:	Tasks 2.1 - 2.5
Deliverable No:	D1.1
Partner responsible:	University of Macedonia (UOM)
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Date:	31/07/2023
Status:	Final
Language:	English
Dissemination level:	P = Public
DOI:	10.17471/54023
How to cite:	Papadopoulos, K, Koustriava, E., Charitakis, K., Isarai, L., Manganello, F., Urton, K., Grünke, M., Carmona, R.M., Selva, J.P., Fernández Gil, J.M., Ferlino, L., Crespo, C.P., Hoff, S., Klöpfer, C., & Schoppmann, M. (2023). *Knowledge and Skills of Teaching staff and Accessibility*

	Advisors. Report of HEDforALL Erasmus+ project. Thessaloniki, Greece: University of Macedonia.

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ABBREVIATIONS

Term	Explanation
SwD	Students with Disabilities
HEI	Higher Education Institute
RES	Project Result

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ABSTRACT

The HEDforALL project aims at improving the inclusion of Students with Disabilities (SwD) (visual, hearing, physical/mobility/ impairments and learning difficulties) in Higher Education Institutes (HEI) and support academic personnel to develop digital competences in order to cope with the SwD's needs on accessible resources and the shift to digital education and e-Learning. The ultimate aim of HEDforALL is the development of a set of educational material, development practices and distance education/e-Learning methodologies for the implementation of digital education in higher education.

In this framework, HEDforALL needs to identify the former knowledge of advisors and teaching staff of SwD regarding accessible materials, their knowledge on the available materials and their possible experience on using and / or developing them. Qualitative and quantitative methods were employed for that purpose.

INTRODUCTION

This report presents the activities and results of the work package "Project Result 2 (RES2)" titled "Knowledge and Skills of Teaching staff and Accessibility Advisors" which aims to identify:

a) the types/forms of adapted educational materials for SwD advisors and teaching staff are aware of and their experience in using and/or developing them (e.g. accessible videos, verbal descriptions of pictures or tactile and audio-tactile pictures, maps, charts and mathematical or chemical equations in accessible digital format for students with blindness etc.),
b) the knowledge and know-how of advisors and teaching staff on assistive technology (software and hardware) aimed at SwD and on mainstream technology with features beneficial to SwD, and
c) the experience of advisors and teaching staff on distance education (DE) for SwD.

Initially, interviews were conducted for advisors and teaching staff separately in order to identify a) the types/forms of adapted educational materials they are aware SwD use for different courses taught in higher education b) the adapted educational materials they can produce on their own, c) their experience in DE programs / courses with SwD and any adaptations on the material they have made while working on them for each group of SwD (e.

g. visual impairments, hearing impairments, mobility impairments, learning difficulties), and d) the needs revealed by distance education for the advisors and teaching staff themselves. The findings from the qualitative analysis (applying content analysis) of the interviews was used for the design of questionnaires (**see APPENDIX IV: Questionnaires**) that were answered by the advisors and teaching staff of SwD in the next phase of the same study. For the design of the questionnaires apart from the qualitative data of the interviews, the extensive previous experience of the authors in the production of accessible educational materials for SwD was used. The questionnaires consist of closed-type questions. Actually, each questionnaire consists of a list of items concerning the types/forms of adapted educational materials, the assistive equipment (devices and applications/software), and the mainstream technology SwD may need and two questions on the experience of the advisors and teaching staff concerning DE for SwD. The answers of the participants will be recorded by using a five-point Likert Scale. The present report consists of two sections. The first section **(Section-A)** concerns the qualitative study for the advisors and teaching staff and the second section **(Section-B)** concerns the quantitative study for the advisors and teaching staff.

SECTION-A: QUALITATIVE STUDY

1. Methodology

The aim of *Task 2.2 "Implementation of interviews" (with teaching staff and accessibility advisors)* was the research base identification of qualitative data of:

- What types/forms of accessible material participants are aware that are being used by SwD.
- Which ones of these types/forms of accessible material they can produce by themselves.
- Their experience in DE programs / courses for SwD
- What adaptations they have made to the educational material for each group of SwD during DE.
- What professional needs were revealed to them through DE.

The results of this task of RES2 would then be used as input for the following tasks of the particular Project Result RES2. Based on the above semi-structured interviews were conducted with accessibility advisors and teaching staff. The interviews were conducted either online or in person. The researchers were given specific instructions on how to conduct the interview procedure together with an introductory text to be read aloud to participants before the interview. The introductory text provided to the participants information on the purpose of the study and on the procedure to be followed. The researchers recorded (audio recording) the whole interview. Apart from the questions of the actual interview, each participant was asked to answer some questions on demographics characteristics that needed to be answered at the beginning of the interview (APPENDIX II).

2. Research Instrument

The first part of the instrument included the instructions in a separate text document (.docx file) (APPENDIX I). The instructions document had the following sections.

- **Purpose of the study** explaining what the purpose of the study is.
- **Instructions to moderators of Tests** on how the researchers should conduct the interview.
- **Introductory text** that the interviewers should read before the interview begins.

The second part of the instrument included the demographic data questions to be filled in for each participant (APPENDIX II). The demographic inquiries differed for each group of participants due to the difference in their professions.

The third part of the instrument included the interview questions to be answered by the participants (APPENDIX III). The questions in this part differed slightly for each group of participants due to the difference in their professions.

3. Participants

Fourteen accessibility advisors were interviewed in total. The number of participating accessibility advisors that each partner interviewed is depicted in Table 1. The participants were from 21 to 59 years old. Six were male and 8 were female. Seven were members of accessibility units /laboratories, 5 were accessibility advisors, 1 was a member of library staff and 1 held a different position and worked in the coordination office for SwD. Regarding their experience, the years of experience ranged from 2 to 28 (M = 12.1). Most of the advisors interviewed mentioned that they did not have sign language (64.3%) or braille knowledge (78.6%), while 42% had no official expertise (e.g. seminar, degree) in special education. One participant had a PhD in special education, two had a master's degree, one had a bachelor's degree, one had attended a workshop, two had undefined expertise and one did not specify. The advisors catered to different groups of SwD and they referenced using various means of assistive technology, such as screen readers, CCTV, alternative/ ergonomic mouses, text-to-speech and speech-to-text software, magnifiers, videos with captions or transcriptions, magnifiers, IVEO system, braille printer, FM systems, adapted workstations, wireless microphones, automatic subtitles. Advisors reported having help (50%) and infrastructure (85.7%) available for the development of accessible educational materials.

Thirty-six members of the teaching staff were interviewed in total, as well. The number of participating teaching staff that each partner interviewed is depicted in Table 2. The sample consisted of 22 women and 14 men. The age ranged from 26 years to 65 years old, with an average age of 46.9 years. Fourteen individuals answered that they were Lecturer/ Special Teaching Staff/Lab Staff/Special Technical Lab Staff and 21 answered they were professors.

Table 1

Number of Accessibility Advisors and Teaching Staff that participated in the interviews per partner

Partner	Accessibility Advisors	Teaching Staff
UOM	4	8
CNR	2	6
UOC	5	14
UA	3	8

One individual answered he was postdoctoral personnel. The employment status of 33 out of 36 was full time while 3 were occupied part time. The main teaching subjects were:

- Information Technology
- Music science and art
- European politics
- Logistics
- Special education and school psychology
- Special education with use of supporting technology
- Marketing
- Social Work
- Biology
- Chemistry
- Administrative law
- Political economy
- Disability psychology, adolescent psychology
- Special education
- Didactics of special pedagogy
- Educational sciences (game-based learning)
- Medicine/physiology
- Business education
- Special education.

- Pedagogy and rehabilitation of people with hearing impairments
- Special education (school pedagogy)
- Pedagogy methods (inclusive education)
- Special education (clinical child support)
- Special education (rehabilitation)
- Educational sciences (school pedagogy)

The average years of teaching experience were 14.9 years with the least experience being half a year and the highest 35 years. Thirty-one individuals answered they did not know sign language while 5 answered they knew and only one had knowledge of the braille system. Twenty-seven answered they do not use assistive technology while 9 that they do. The following means were mentioned:

- Speech to text
- Magnifier
- Tools for website processes
- Automated captions
- Screen readers
- Braille translators
- Text to speech software
- Augmentative and alternative communication
- Educational apps for each impairment (learning impairments)
- Braille display
- Braille embossers
- CCTV
- Adapted switches
- Eye tracking
- Remote control systems (e.g., eye tracking)
- Labster software
- Speech synthesis software
- Transmission systems

Twenty participants answered they do not have any expertise in special education, 4 that they possess a bachelor's degree, 6 possess a master's degree, 3 possess a PhD degree and lastly 3 individuals have taken seminars and workshops.

On average 32 participants taught 7,2 courses (min=1 course, max=40 courses) with DE with 4 mentioning that they had not taught any DE courses. The average hours of DE courses lectures were 250 (min=2 hours, max=1000). Lastly, 24 participants answered that there is no computer support or accessibility advisor in the curriculum, 9 answered affirmatively and 3 did not know.

4. Results

4.1 Interview question 1

4.1.1 Answers of advisors

The following table depicts the frequency of occurrence of answers of advisors.

	Educational material	
	Accessible printed material	**Frequency**
1	Large prints (included enlarged books) /Enlarged text	4
2	Braille prints (including Braille books)	8
3	Piaf prints (i.e., using microcapsule paper)	4
4	Text with different color fonts	2
5	Relief printed material	1
6	Plastic paper prints/thermoform	2
7	3D printed material	4
8	Tactile maps	3
9	Tactile graphics /pictures	4
10	Tiger embossed prints	3

11	Adapted notes (which may include mathematical equations)	2
	Accessible Digital material	**Frequency**
1	Accessible word	8
2	Accessible pdf	8
3	Accessible PowerPoint	9
4	Daisy	4
5	Accessible epub	5
6	Digital books /ebooks / digital literature	2
7	Audio recorded lecture notes	1
8	Audio books	4
9	Digital texts and digital manuals	2
10	Pictures with description	4
11	Pictures with alternative text	3
12	Audio material	1
13	Digital media	1
14	Accessible websites	1
15	Video with captions	2
16	Video with transcriptions	4
17	Video with sign language	1
18	Video with subtitles	3
19	Recorded lectures	1
20	Recorder lectures with subtitles	3

21	Subtitles	4
22	Educational videos	1
23	Accessible music	1
24	Audio description	2
25	Verbal description	2
	Tactile material	**Frequency**
1	Tactile constructions (i.e., constructs with different materials)	1
	Audio tactile material	**Frequency**
1	Audio tactile material	4
	Assistive Technology	
	Assistive technology devices	**Frequency**
1	Tactile blackboard	1
2	Tactile screens	1
3	FM systems	1
4	Braille keyboard	1
5	Micro-scanners and pens	1
6	Wireless microphone systems	1
7	Mobile induction loops	1
8	Accessible workstations in labs	1
9	Portable video magnifier	1
10	Braille printer	1
	Assistive technology software	**Frequency**

1	Screen reader	1
2	EDICO	1
3	Transcription programmes	1
4	Speech tools	1
5	Subtitle generators	1
6	Atkinson Hyperlegible	2
7	Speech synthesizers	1
	Mainstream Technology	**Frequency**
1	Google docs	1
2	Moodle LMS	1
3	Zoom	2
	Assistive Services	**Frequency**
1	Sign language in lectures and / or exams	2
2	Time extensions during exams	1

4.1.2 Answers of teaching staff

The following table depicts the frequency of occurrence of answers of teaching staff.

	Educational material	
	Accessible printed material	**Frequency**
1	Braille prints (including Braille books)	10
3	Large prints (included enlarged books)	4
4	Tactile books (graphics, images)	7

5	Tactile maps	2
6	Microcapsule paper prints	3
7	Embossed paper prints	1
8	Plastic paper prints/thermoform	3
9	Tiger printed tactile pictures	2
10	3D models	2
11	Concept maps	2
	Accessible digital material	**Frequency**
1	Accessible books	6
2	Digital material	3
3	Simplified texts	1
4	Audio material	2
5	Audio lectures	7
6	Audio books	3
7	Audio descriptions	2
8	Accessible video	1
9	Videos with captions	3
10	Videos with transcription	5
11	Videos with subtitles	8
12	Accessible word	9
13	Accessible pdf	9
14	Accessible powerpoint	19

15	Accessible epub	1
16	Accessible Daisy	1
17	Images with description-alternative text	4
18	Accessible paintings (images)	1
19	Serious games (the educational process takes part through the game)	1
20	Sign language translated material	3
21	Multimodal material no specification	1
22	Accessible mathematical equations	1
23	METACOM symbols	1
24	Accessible webpage	2
	Audio tactile material	**Frequency**
1	Audio tactile graphics-images	3
	Assistive Technology	
	Assistive Technology Devices	**Frequency**
1	Touch screens	1
2	Teleloupe	1
3	Braille printers	1
4	Hearing loops	1
5	Braille display	1
6	Magnifiers	4
7	Thermoform	1
8	FM systems	1

	Assistive technology software	Frequency
9	Screen readers (e.g. Jaws)	8
10	Transcription software	5
11	Text to braille software	1
12	ListenALL	1
13	OCR software	1
14	Contrast tools and software	1
15	Speech to text software	1
16	Concept maps software	1
17	Premiere software for transcription	1
18	Text to speech software	1
	Mainstream Technology	**Frequency**
1	Moodle LMS	1
2	Microphone	4

4.2 Interview question 2

4.2.1 Answers of Advisors

Frequency of occurrence of answers of advisors in the second interview question (i.e. educational material they are capable of producing by themselves.

	Educational material	
	Accessible printed material	**Frequency**
1	Plastic paper prints/ thermoform	1
2	Large prints	2

3	Notes with mathematical equations	1
4	Braille prints (including braille books)	5
5	Tiger embossed prints	1
6	Microcapsule paper prints (e.g., Piaf prints)	1
	Accessible Digital material	**Frequency**
1	Accessible pdf	6
2	Images with alternative text	4
3	Accessible word	6
4	Accessible epub	5
5	Accessible powerpoint	6
6	Accessible Daisy	3
7	Accessible text (books, notes etc.)	3
8	Video with captions	2
9	Pictures with verbal / audio description	2
10	Audio files (books, notes)	3
11	Videos with transcription	4
12	Color corrected texts	1
13	Videos with subtitles	2
14	Accessible websites	1
15	Accessible books with HTML / HTML content	1
16	Subtitles	3
17	Recorded lessons with subtitles	1

18	Educational videos	1
19	Video recorded material	1
20	Audio recorded material	1
	Tactile material	**Frequency**
1	3D printed material	1
	Audio tactile material	**Frequency**
1	Audio tactile material	1

4.2.2 Answers of Teaching staff

Frequency of occurrence of answers of teaching staff in the second interview question (i.e., educational material they are capable of producing by themselves.

	Educational material	
	Accessible printed material	**Frequency**
1	Braille prints (including braille books)	2
2	Tiger embossed prints	1
3	Adapted books (added tactile pieces and images/picture annotation)	1
4	Tactile images	1
5	Tactile material	1
6	Serious games (the educational process takes part through the game)	2
	Accessible Digital material	**Frequency**
1	Accessible pdf	8
2	Images with alternative text	3
3	Accessible word	7

4	Accessible presentations (powerpoint)	19
5	Accessible text (books, notes etc.)	8
6	Pictures with verbal / audio description	2
7	Videos with transcription	3
8	Videos with subtitles	5
9	Accessible websites	2
10	Subtitles	4
11	Recorded lessons with subtitles	1
12	Accessible videos	1
13	Audio recorded material	3
14	Educational videos	1
15	METACOM symbols (Augmentative and Alternative Communication (AAC))	1
16	Accessible mathematical equations	1
17	Digital books with legible texts (e.g., arial fonts, Tahoma, San serif, Helvetica)	1
18	Digital texts with simplified language	2
19	Digital conceptual/mental maps	1
20	Recorded lectures	1
21	Educational games	1
22	Digital material	2
	Audio tactile material	**Frequency**
1	Audio tactile pictures	1

4.3 Interview question 3

Frequency of occurrence of answers of advisors and teaching staff in the third interview question.

4.3.1 Answers of Advisors

Concerning their former participation in DE programs or courses with SwD as participants, 71.4% of the participating advisors answered that they had participated in such programmes, while 28.6% answered negatively, that is they had no former experience.

4.3.2 Answers of Teaching Staff

Concerning their former participation in DE programs or courses with SwD as participants, 57.1% of the participating members of teaching answered that they had participated in such programmes, while 31.4% answered negatively, that is they had no former experience. Some members of the teaching staff, specifically 11.4% of the participants, had participated in DE programs but did not know if any of the participants had been SwD.

4.4 Interview question 4

Answers of advisors and teaching staff in the fourth interview question.

4.4.1 Answers of Advisors

The participating advisors had created accessible materials for 1.9 DE programmes on average (min =0, max = 10). Most participants, even though asked, did not specify for which disability type / group they had created the accessible material for. Only four participants mentioned the disability groups they had created accessible materials for; all had catered to students with visual impairments, three had catered to students with hearing impairments, two had catered to students with learning difficulties and students with psychological disorders, one had catered to students with chronic diseases and one had catered to students with mobility impairments.

4.4.2 Answers of Teaching Staff

Only half of the participating members of teaching staff mentioned the number of DE programs they had participated in. These eighteen participants had taught from 0 to 7 DE programs (M = 2.11). In these DE programs, 9 members of teaching staff had taught students with hearing impairments, 7 had taught students with visual impairments, 4 had taught students with mobility impairments or learning difficulties and two had taught students with psychological disorders.

4.5 Interview question 5

Frequency of occurrence of answers of the advisors and teaching staff in the fifth interview question concerning the adaptations they have made on educational material for each group of SwD in order to make the DE programs accessible.

4.5.1 Answers of Advisors

	Educational material	
	For students with visual impairments	**Frequency**
1	Large prints	2
2	Color corrected texts	3
3	Microcapsule paper prints (e.g., Piaf prints)	1
4	Accessible word	3
5	Accessible pdf	3
6	Accessible epub	2
7	Images with alternative text	4
8	Accessible daisy	1
9	Accessible mathematical equations	1
10	Digital books with legible texts (e.g., arial fonts, tahoma, san serif, helvetica)	3
11	Accessible presentations (Powerpoint)	3
12	Tactile graphics	1
13	Audio-tactile graphics	1
14	Braille prints	1
15	Pictures with description	1

	For students with hearing impairments	Frequency
1	Videos with captions	1
2	Videos with transcriptions	1
3	Audio recorded material transcribed to text	1
4	Automatic subtitles	1
5	Video with subtitles	3
6	Videos with sign language	1
7	Lessons on Zoom with subtitles	1
	For students with learning difficulties	**Frequency**
1	Accessible printed texts (fonts, spaces etc.)	2
2	Simplified text	1
	For students with mobility impairments	**Frequency**
1	Accessible documents	1

4.5.2 Answers of Teaching Staff

	Educational material	
	For students with visual impairments	**Frequency**
1	Color corrected texts	1
2	Accessible word	1
3	Accessible pdf	1
4	Images with alternative text	1

5	Digital books with legible texts (e.g., arial fonts, tahoma, san serif, helvetica)	1
6	Accessible presentations (Powerpoint)	8
7	Braille prints	1
8	3d printed material (with different textures)	2
9	Accessible digital material	2
10	Audio recorded material	1
	For students with hearing impairments	
1	Audio recorded material transcribed to text	2
2	Videos with subtitles	3
3	Lessons on Zoom with subtitles	1
4	Recorded lectures	1
5	Accessible presentations (with subtitles)	3
	For students with learning difficulties	
1	Accessible presentations (fonts, spaces etc.)	2
2	Gamification of lesson / Serious games	2
3	Recorded lectures	2
4	Adapted examinations	1
5	Organizational aids (concept maps, summaries etc.)	1

4.5 Interview question 6

Frequency of occurrence of answers of the advisors and teaching staff in the sixth interview question concerning their professional needs.

4.6.1 Answers of Advisors

Concerning their own professional needs, 12 participating advisors (85.7%) have needs in the area of knowledge and understanding of instructional practices of DE for SwD, 11 advisors (78.6%) have needs in the area of creating accessible educational material and 9 advisors (64.3%) have needs in the area of teaching SwD.

4.6.2 Answers of Teaching Staff

Concerning their own professional needs, 34 members of the participating teaching staff (94.4%) have needs in the area of creating accessible educational material, 29 members of the participating teaching staff (80.6%) have needs in the area of knowledge and understanding of instructional practices of DE for SwD, and 27 members of the participating teaching staff (75%) have needs in the area of teaching SwD.

SECTION-B: QUANTITATIVE RESEARCH - QUESTIONNAIRES

1. Participants

The questionnaire for advisors was answered by ***33 advisors*** (1 from Italy, 9 from Germany, 9 from Spain and 14 from Greece). The participants' ages ranged from 21 to 57 (M = 41.06) years of age and on average they had 9.18 years of experience as accessibility advisors. Twelve of the participants were male and 21 were female. Twenty of the participants had attended educational programmes on teaching SwD, accessibility or the production of accessible material. Specifically, 12 had attended a seminar, 7 had attended a postgraduate programme and 1 had attended both.

The questionnaire for teaching staff was answered by ***131 members of the teaching staff*** (48 from Italy, 25 from Germany, 24 from Spain and 34 from Greece). The participants' ages ranged from 22 to 68 (M = 49.8) years of age and on average they had 18.7 years of experience as teaching staff. Fifty-five of the participants were male, 74 were female and 2 identified as gender diverse. Thirty-eight of the participants had attended educational programmes on teaching SwD, while 93 had not. From those that had attended programmes, 27 had attended a seminar, 7 had attended a postgraduate programme, 2 had attended both and 2 had attended a bachelor programme.

2. Research Instruments

The findings from the qualitative analysis (applying content analysis) of the interviews was used for the design of two questionnaires (**see APPENDIX IV: Questionnaires**), one for advisors and one for teaching staff, that were answered by the participants in each country.

3. Results

3.1 Questionnaire results for the advisors

Educational material

The following tables present the results of the descriptive statistics (mean and standard deviation) of the accessibility advisors' responses for each item of the questionnaire and for each of the three questions concerning the educational material. The questions answered by the participants were:

Q1: To what extent do you know (are you aware of the features of) this educational material?

Q2: To what extent have you used this educational material?

Q3: What is your experience in producing this type of educational material?

Accessible Printed Material	**Q1**		**Q2**		**Q3**	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. Large prints (included enlarged books)	2.563	1.27	1.636	1.54	1.727	1.51
2. Braille prints (included braille books)	2.606	1.37	1.788	1.34	1.636	1.52
3. Tactile books (Text and graphics)	1.636	1.29	0.939	1.20	1.000	1.50
4. Tactile graphics/images	1.727	1.23	1.273	1.44	1.000	1.15
5. Microcapsule paper prints (e.g., Piaf prints)	1.879	1.58	1.121	1.14	0.909	1.28
6. Tiger embossed prints	0.909	1.16	0.697	1.07	0.727	1.21
7. Plastic paper prints/ thermoform	1.485	1.46	0.970	1.26	0.727	1.26
8. Relief printed material	1.303	1.29	0.758	1.09	0.697	1.26
9. Pictures with Braille description	1.970	1.38	1.242	1.37	0.939	1.09
10. Tactile maps	2.061	1.43	1.061	1.06	0.970	1.29
11. Verbal descriptions in braille	1.727	1.38	1.000	1.22	1.030	1.31
12. Raised-line paper for writing or graphing	1.152	1.37	0.879	1.19	0.697	1.16
13. 3D printed material (by 3D printer)	1.576	1.28	0.818	1.13	0.970	1.36
14. Printed material (e.g. lecture notes)	2.474	1.47	2.053	1.65	1.789	1.32
15. Printed material with images, graphics, and visual elements	2.182	1.49	1.182	1.33	1.333	1.53
16. Accessible text (books, notes etc.)	2.848	1.30	2.606	1.48	2.394	1.52
17. Accessible presentations	2.121	1.56	1.939	1.46	1.909	1.72
18. Adapted books (added tactile pieces and images/picture annotation)	2.030	1.40	1.242	1.30	0.970	1.31
19. Printed conceptual/mental map	1.970	1.51	1.303	1.55	0.939	1.12
20. Flash cards (a study or memorisation tool, with information on one or both sides.)	1.606	1.39	0.848	1.12	0.939	1.30

Accessible Printed Material	**Q1**		**Q2**		**Q3**	
21. Notes with mathematical equations	1.697	1.45	1.121	1.36	1.091	1.35

Accessible Digital Material	**Q1**		**Q2**		**Q3**	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. Accessible word	2.970	1.40	3.030	1.26	2.909	1.53
2. Accessible pdf	2.970	1.38	2.879	1.43	3.061	1.34
3. Accessible presentations (Powerpoint)	2.667	1.49	2.697	1.57	2.545	1.70
4. Accessible daisy	2.303	1.53	1.545	1.35	1.697	1.69
5. Accessible epub	2.455	1.42	1.788	1.60	1.606	1.54
6. Accessible excel files	2.273	1.57	1.758	1.64	1.656	1.62
7. Ebooks	2.606	1.39	1.848	1.50	1.625	1.48
8. Accessible books with HTML / HTML content	1.879	1.36	1.303	1.59	1.091	1.42
9. Audio recorded material (e.g., lecture notes, books)	2.394	1.48	1.424	1.30	1.303	1.59
10. Video recorded material (e.g. lectures)	2.031	1.58	1.813	1.53	1.485	1.39
11. Pictures with verbal-audio description	2.636	1.50	2.152	1.54	1.909	1.63
12. Images with alternative text	2.939	1.39	2.515	1.64	2.455	1.60
13. Verbal description in audio file	1.818	1.63	1.424	1.66	0.970	1.36
14. Digital books with legible texts (e.g., arial fonts, tahoma, san serif, helvetica)	2.697	1.51	2.394	1.37	1.939	1.62
15. Accessible videos	2.273	1.44	1.515	1.48	1.394	1.22
16. Videos with sign language	1.727	1.48	1.212	1.24	0.848	1.28
17. Videos with transcriptions (including YouTube, lectures)	2.485	1.66	1.424	1.39	1.545	1.35
18. Video with subtitles	2.273	1.61	2.030	1.53	1.750	1.59
19. Google docs	2.563	1.61	2.121	1.54	2.061	1.73
20. Video lessons with slow rhythm	1.485	1.44	0.727	1.21	0.727	1.07
21. Live streaming with captions (e.g. lectures given synchronously online)	2.030	1.61	1.394	1.27	0.909	1.21
22. Digital material with images, graphics, and visual elements	2.303	1.63	2.061	1.60	2.030	1.45
23. Pictograms in digital texts	1.485	1.46	1.000	1.46	0.909	1.18
24. Digital texts with simplified language	2.121	1.43	1.455	1.48	1.212	1.52

Accessible Digital Material	**Q1**		**Q2**		**Q3**	
25. Digital conceptual/mental maps	1.909	1.55	1.182	1.40	0.879	1.08
26. Color corrected texts	2.000	1.62	1.727	1.46	1.469	1.52
27. Accessible Mathematical formulas	2.121	1.69	1.333	1.36	1.515	1.54
28. Symbolic languages	1.212	1.27	0.879	1.45	0.576	1.12
29. Audiobooks	2.273	1.31	1.333	1.11	1.152	1.44
30. Highlighted texts	1.970	1.55	1.455	1.42	1.485	1.35
31. Lecture summaries	1.727	1.46	1.313	1.33	1.091	1.35
32. Accessible websites	2.606	1.46	2.485	1.42	1.970	1.57
33. Digital media	2.152	1.28	2.030	1.61	1.636	1.62
34. Accessible Music	1.152	1.37	0.879	1.24	0.758	1.41

Haptic Material	**Q1**		**Q2**		**Q3**	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. Haptic models (e.g., haptic pictures, graphs, maps etc, manufactured from everyday material attached onto a surface)	1.848	1.42	1.273	1.46	0.939	1.46
2. Manipulatives (e.g., Plastic shapes/objects, Tactile globes, Tactile dolls)	1.576	1.56	0.909	1.31	0.697	1.10

Audio-tactile material	**Q1**		**Q2**		**Q3**	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. Audio-tactile pictures for IVEO/TTT (Systems with audio-tactile feedback)	1.303	1.57	0.939	1.30	0.750	1.30

Assistive Technology

The following tables present the results of the descriptive statistics (mean and standard deviation) of the accessibility advisors' responses for each item of the questionnaire and for each of the two questions concerning the assistive or mainstream technology. The questions answered by the participants were:

Q1: To what degree are you familiar with this device/software/app (are you aware of its features)?

Q2: To what degree do you know how to use this device/software/app?

Assistive-Technology Devices	**Q1**		**Q2**	
	M	**SD**	**M**	**SD**
1. Hand held magnifiers (e.g., reading stone, monocular, magnifying glass)	2.424	1.60	1.879	1.47
2. Text to speech devices (e.g., reading devices)	2.697	1.45	2.636	1.54
3. Daisy-player device (talking book machine)	1.939	1.60	1.667	1.47
4. Traditional Braille typewriter (e.g., Perkins, Tatrapoint)	2.182	1.51	1.455	1.54
5. Electronic Braille typewriter (e.g., Mountbatten)	1.455	1.46	1.273	1.31
6. Braille keyboard	2.152	1.56	1.606	1.43
7. Notetakers (e.g., Braille N' Speak, Braille Lite)	1.455	1.48	1.515	1.68
8. Handheld media player (e.g., Victor Reader Stream)	1.152	1.35	0.818	1.07
9. Touch tablet (e.g., IVEO or TTT)	1.727	1.55	1.273	1.40
10. Refreshable Braille display	1.727	1.51	1.394	1.34
11. Braille printer/ Embosser (e.g., Index Everest, Viewplus Tiger)	2.394	1.58	1.758	1.58
12. CCTV (e.g., MagniLink magnifier, Onyx, Topaz, Optelec ClearView)	2.242	1.56	2.303	1.65
13. Computer monitor magnifier (i.e., device that hooks on the screen and magnifies it)	2.485	1.58	2.061	1.46
14. Portable CCTV/ Portable video magnifier (i.e., devices consisting of a camera, monitor, lighting and provide magnified image)	2.303	1.57	2.091	1.59
15. Adjusted keyboards (enlarged keys, braille keys)	2.576	1.39	1.909	1.40
16. Adapted notebooks (e.g., enlarged pages, grid paper, colored pages)	1.970	1.65	1.212	1.27
17. Tactile-image enhancer (e.g., Piaf, Thermoform)	1.455	1.33	1.485	1.60
18. Scan & text-to-speech devices (e.g., Portable scan translation pen)	2.152	1.56	1.727	1.38
19. Slate and Stylus (tools used by individuals with visual impairment to write text in braille)	1.606	1.50	1.091	1.38
20. Personal digital assistant (PDA, small handheld computers)	1.576	1.52	1.394	1.43
21. Connectclip (Enables hands-free phone calls and music streaming from smartphone)	1.091	1.53	0.848	1.30
22. FM systems (wireless assistive hearing devices that enhance the use of hearing aids)	1.848	1.56	1.758	1.73

Assistive-Technology Devices	**Q1**		**Q2**	
23. Loop systems or audio induction loop (for individuals with hearing impairments)	1.909	1.65	1.727	1.53
24. Speech amplification devices (e.g. ChatterVOX)	1.531	1.44	1.242	1.52
25. Hearing aids (e.g. behind-the-ear (BTE), in-the-ear (ITE), receiver-in-the-ear (RITE), in-the-canal (ITC) and CROS [Contralateral Routing of Signals)/BiCROS (Bilateral Contralateral Routing of Signals)]	1.545	1.46	1.333	1.38
26. Soundproof equipment for indoors environment (i.e., equipment that improve the overall sound quality and intelligibility for individuals with hearing impairment)	1.303	1.40	1.061	1.30
27. Telecoils (or t-coil, a coil of wire that is installed inside many hearing aids and cochlear implants to act as a miniature wireless receiver)	1.061	1.14	1.273	1.55
28. Head stylus (users with mobility impairments control the stylus to interact with touchscreens or other devices)	1.455	1.39	0.879	1.08
29. Adapted keyboards (e.g. small keyboards, ergonomic)	2.879	1.29	2.152	1.48
30. Virtual keyboards/mouse	2.212	1.58	2.000	1.55
31. Adapted mouses (i.e., mouse that has been modified or designed to accommodate individuals with specific physical or cognitive challenges; e.g., ergonomic)	2.788	1.49	2.182	1.55
32. Alternative mouses (e.g. jelly-bean switches, trackball, joystick, leg switch)	2.424	1.46	2.394	1.60
33. Sip and Puff system (users control electronic devices, such as computers or wheelchairs, by using their breath, either blowing or sucking air)	1.219	1.50	1.121	1.43
34. Remote control of computer (e.g. eye tracking system, head mouse)	2.394	1.46	1.758	1.56
35. Personal Emergency response system (i.e., typically a wearable device, equipped with an emergency button that can be pressed to request assistance)	0.879	1.22	1.000	1.39
36. Augmentative and alternative communication devices/software	1.424	1.37	1.242	1.56
37. Tactile blackboard (i.e., a raised-line drawing board)	1.333	1.41	0.970	1.21
38. Tactile screens	2.219	1.34	1.909	1.57

Assistive-Technology Software/Apps	**Q1**		**Q2**	
	M	**SD**	**M**	**SD**
1. Screen reader (e.g., Jaws, VoiceOver, NVDA, TalkBack)	2.939	1.37	2.455	1.54
2. Text-to-speech applications/programs (e.g., Natural Reader, ReadAloud, VoiceDream reader)	2.606	1.58	2.333	1.55
3. Daisy-player software (e.g., Dolphin easy reader, AMIS)	2.303	1.63	1.970	1.51
4. Math-ML player (enables assistive technology such as screen readers and screen magnifiers to speak, navigate math expressions and convert to braille)	1.758	1.54	1.469	1.67
5. Ebook readers (e.g., Dolphin EasyReader, Read2go, Thorium)	2.091	1.59	1.875	1.52
6. Multifunctional text-to-speech software (e.g., Voice Dream Reader, Voice Dream Writer)	2.182	1.49	1.667	1.53
7. Screen magnification software (e.g., Supernova)	2.788	1.43	2.688	1.45
8. Screen magnification apps (e.g., Microsoft windows magnifier)	2.788	1.49	2.313	1.57
9. Braille to speech software (e.g., TELEO)	1.515	1.35	1.406	1.54
10. Braille translator/ text-to-braille software	1.727	1.51	1.406	1.43
11. Document and Word Processing software with braille translator (e.g., Biblos, Odt2braille with OpenOffice Writer)	1.848	1.33	1.406	1.36
12. Document and Word Processing software with text-to-speech conversion (e.g., Speak with MS Office)	1.939	1.60	1.774	1.54
13. Word prediction software/app	2.091	1.65	1.645	1.56
14. Word completion software/app	1.788	1.39	1.742	1.75
15. Scan & speech apps (e.g., Voice Dream Scanner)	1.606	1.50	1.548	1.36
16. Digital voice recorder	2.212	1.39	1.906	1.67
17. Talking calculator	1.455	1.54	1.484	1.57
18. Specialized Math Software (digitally allows the use of supports such as screen magnification, text-to-speech support, audio representation of graphics, and translation into Nemeth code)	1.697	1.57	1.233	1.50
19. Object identification apps	1.290	1.27	1.452	1.59
20. Color identification apps	1.406	1.48	1.355	1.43
21. Light identification apps	1.387	1.41	1.129	1.38
22. Speech-to-Text software/audio transcription apps (e.g. Dragon anywhere, Google Gboard, Apple dictation)	2.242	1.48	2.125	1.50
23. Voice recognition systems (e.g. ListenAll)	2.188	1.65	1.688	1.64

Assistive-Technology Software/Apps	**Q1**		**Q2**	
24. Automatic captioning software/app (Communication Access Realtime Translation (CART))	1.909	1.42	1.625	1.68
25. Voice control apps (e.g. Dragon naturally speaking)	1.848	1.52	1.594	1.36
26. Scanning input (screen scanning software/application)	1.939	1.46	1.531	1.59
27. Highlighting text application	1.758	1.48	1.719	1.55
28. Accessible calculators	1.485	1.56	0.969	1.33
29. Concept map program (e.g. Cmap)	1.636	1.54	1.688	1.73
30. Reminder app/calendar with notifications	2.333	1.61	2.063	1.58
31. Spell checker/word correction programs	2.242	1.50	2.063	1.64
32. Time management apps	1.788	1.58	1.625	1.56
33. EDICO (a Scientific Editor specifically designed for the blind)	1.636	1.50	0.969	1.26
34. Atkinson Hyper Legible font	1.313	1.42	1.344	1.72

Mainstream Technology	**Q1**		**Q2**	
	M	**SD**	**M**	**SD**
1. Tablet	3.156	1.27	3.188	1.31
2. Laptop	3.406	1.29	3.500	1.19
3. Personal Computer (PC)	3.344	1.21	3.250	1.24
4. MS Windows software	3.063	1.41	3.125	1.36
5. Scanner	3.344	1.21	3.156	1.22
6. OCR (optical character recognition e.g., Abbyy Finereader)	3.031	1.31	2.781	1.52
7. Cell phone	3.063	1.58	3.344	1.36
8. Smart phone	3.406	1.13	3.344	1.18
9. Additional light sources	2.313	1.55	2.094	1.57
10. Color adjustment on screens	2.813	1.42	2.594	1.34
11. Audio recorder	2.563	1.39	2.531	1.57
12. Microphones	2.844	1.46	2.969	1.40
13. Accessible online (synchronous and asynchronous) communication (e.g. MS Teams, Zoom)	3.156	1.27	2.875	1.36
14. Virtual board	2.219	1.48	2.156	1.53
15. Headset/Headphones	3.125	1.48	3.094	1.33
16. Video recording software/apps (e.g. OBS)	2.594	1.41	2.281	1.49
17. Media players for video with subtitles (e.g. VLC)	2.688	1.51	2.906	1.42

Mainstream Technology	**Q1**		**Q2**	
18. Book scanner desktop or portable (e.g., Irispen scan)	2.781	1.41	2.563	1.52
19. Cortana on windows (virtual assistant for setting reminders, searching and answering questions for the user)	2.031	1.53	1.625	1.45
20. Email apps	3.469	1.22	3.313	1.18
21. Touch devices (interaction through touch)	2.188	1.42	2.219	1.54
22. Smart watches	2.677	1.56	2.563	1.63
23. Clocks	3.156	1.32	2.719	1.46
24. Word processing software	3.219	1.36	3.188	1.35
25. Pad and pen	3.063	1.50	2.813	1.42
26. Learning management systems (platform for all education processes - lessons, notes, exams etc.)	2.313	1.51	2.094	1.57
27. Summarizing programs (e.g. ePico!)	1.156	1.46	1.250	1.61
28. Digital dictionaries	2.813	1.33	2.563	1.39

Existing experience in distance education of Students with Disabilities

The following table presents the results of the descriptive statistics (mean and standard deviation) of the accessibility advisors' responses for each of the two questions.

	M	**SD**
1. What is your experience in distance education of students with disabilities	1.750	1.30
2. To what degree are you considered to have the knowledge and experience to provide distance education for students with disabilities?	2.125	1.13

3.2 Questionnaire results for the teaching staff

Educational material

The following tables present the results of the descriptive statistics (mean and standard deviation) of the teaching staff' responses for each item of the questionnaire and for each of the three questions concerning the educational material. The questions answered by the participants were:

Q1: To what extent do you know (are you aware of the features of) this educational material?

Q2: To what extent have you used this educational material?

Q3: What is your experience in producing this type of educational material?

Accessible Printed Material	**Q1**		**Q2**		**Q3**	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. Braille prints (included braille books)	1.611	1.339	0.354	0.905	0.308	0.922
2. Large prints (included enlarged books)	1.754	1.409	0.646	1.120	0.504	1.039
3. Tactile books (Text and graphics)	1.214	1.370	0.225	0.721	0.351	0.859
4. Tactile graphics/images	1.328	1.356	0.297	0.777	0.351	0.944
5. Tactile maps	1.252	1.332	0.308	0.834	0.262	0.677
6. Printed conceptual/mental map	1.290	1.350	0.625	1.171	0.618	1.140
7. Microcapsule paper prints (e.g., Piaf prints)	0.546	1.100	0.264	0.805	0.279	0.884
8. Tiger embossed prints	0.531	1.065	0.240	0.836	0.310	0.891
9. Plastic paper prints/ thermoform	0.602	1.060	0.211	0.810	0.321	0.806
10. 3D printed material (by 3D printer)	1.233	1.308	0.328	0.785	0.321	0.757
11. Pictures with Braille description	1.123	1.251	0.328	0.852	0.248	0.791
12. Adapted books (added tactile pieces and images/picture annotation)	0.962	1.278	0.339	0.847	0.492	1.036
13. Accessible text (books, notes etc.)	1.740	1.432	0.962	1.290	1.046	1.369

Accessible Digital Material	**Q1**		**Q2**		**Q3**	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. Accessible word	1.946	1.543	1.446	1.575	1.496	1.556
2. Accessible pdf	1.869	1.475	1.546	1.600	1.466	1.614
3. Accessible presentations (Powerpoint)	1.781	1.531	1.557	1.570	1.477	1.571
4. Accessible daisy	0.605	1.155	0.313	0.824	0.481	1.126
5. Accessible epub	0.815	1.316	0.562	1.194	0.496	1.105
6. Accessible excel files	1.492	1.521	1.023	1.422	0.831	1.295
7. Ebooks	2.084	1.452	1.282	1.427	0.659	1.234
8. Digital books with legible texts (e.g., Arial fonts, Tahoma, San serif, Helvetica)	1.715	1.469	1.185	1.419	0.822	1.320
9. Digital texts with simplified language	1.354	1.499	0.740	1.219	0.500	1.050

Accessible Digital Material	**Q1**		**Q2**		**Q3**	
10. Audio recorded material (e.g., lecture notes, books)	1.985	1.468	1.062	1.391	0.884	1.321
11. Audiobooks	2.107	1.464	0.814	1.316	0.519	1.047
12. Pictures with verbal-audio description	1.504	1.427	0.685	1.086	0.488	1.047
13. Images with alternative text	1.169	1.426	0.623	1.190	0.688	1.209
14. Videos with sign language	1.466	1.490	0.508	1.080	0.465	1.039
15. Videos with transcriptions (including YouTube, lectures)	1.718	1.541	1.000	1.346	0.875	1.298
16. Videos with subtitles	2.117	1.571	1.062	1.402	0.906	1.348
17. Live streaming with captions (e.g., lectures given synchronously online)	1.767	1.508	0.938	1.310	0.738	1.236
18. Digital conceptual/mental maps	1.313	1.499	0.863	1.335	0.578	1.147
19. Color corrected texts	1.046	1.493	0.588	1.066	0.656	1.239
20. Multimodal material (e.g., mixture of linguistic, visual, gestural, spatial and audio elements)	1.023	1.361	0.504	1.119	0.542	1.090
21. Serious games (the educational process takes part through the game)	1.331	1.512	1.015	1.463	0.723	1.251
22. METACOM symbols (Augmentative and Alternative Communication (AAC))	0.715	1.277	0.580	1.189	0.318	1.031
23. Accessible mathematical equations	0.748	1.315	0.496	1.119	0.315	0.973

Haptic Material	**Q1**		**Q2**		**Q3**	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. Haptic models (haptic pictures, graphs, maps etc., manufactured from everyday material attached onto a surface)	0.661	1.093	0.318	0.750	0.344	0.967
2. Manipulatives (Plastic shapes/objects, Tactile globes, Tactile dolls)	0.744	1.194	0.344	0.943	0.388	0.921

Audio-tactile material	**Q1**		**Q2**		**Q3**	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. Audio-tactile pictures for IVEO/TTT (Systems with audio-tactile feedback)	0.496	1.046	0.266	0.748	0.289	0.898

Assistive Technology

The following tables present the results of the descriptive statistics (mean and standard deviation) of the teaching staff' responses for each item of the questionnaire and for each of the two questions concerning the assistive or mainstream technology. The questions answered by the participants were:

Q1: To what degree are you familiar with this device/software/app (are you aware of its features)?

Q2: To what degree do you know how to use this device/software/app?

Assistive-Technology Devices	**Q1**		**Q2**	
	M	**SD**	**M**	**SD**
1. Tactile screens	1.357	1.536	1.070	1.453
2. Loop systems or audio induction loop (for individuals with hearing impairments)	0.777	1.325	0.469	1.036
3. Hand held magnifiers (e.g., reading stone, monocular, magnifying glass)	1.277	1.420	0.791	1.291
4. Text to speech devices (e.g., reading devices)	1.469	1.415	0.946	1.313
5. Daisy-player device (i.e., talking book machine)	0.519	1.061	0.369	0.890
6. Traditional Braille typewriter (e.g., Perkins, Tatrapoint)	0.785	1.233	0.357	0.942
7. Electronic Braille typewriter (e.g., Mountbatten)	0.721	1.225	0.398	1.007
8. Braille keyboard	0.808	1.195	0.341	0.879
9. Notetakers (e.g., Braille N' Speak, Braille Lite)	0.531	1.072	0.431	1.063
10. Handheld media player (e.g., Victor Reader Stream)	0.461	0.995	0.377	0.909
11. Touch tablet (e.g., IVEO or TTT)	0.578	1.161	0.453	1.034
12. Refreshable Braille display	0.543	1.146	0.336	0.907
13. Braille printer/ Embosser (Index Everest, Viewplus Tiger)	0.492	1.101	0.523	1.177
14. CCTV (e.g., MagniLink magnifier, Onyx, Topaz, Optelec ClearView)	0.465	1.008	0.469	1.094
15. Computer monitor magnifier (i.e., device that hooks on the screen and magnifies it)	0.750	1.242	0.508	1.050
16. Portable CCTV/ Portable video magnifier (i.e., devices consisting of a camera, monitor, lighting and provide magnified image)	0.608	1.165	0.383	0.989
17. Adjusted keyboards (enlarged keys, braille keys)	0.715	1.234	0.453	1.056

Assistive-Technology Devices	**Q1**		**Q2**	
18. Adapted notebooks (e.g., enlarged pages, grid paper, colored pages)	0.791	1.273	0.508	1.072
19. Tactile-image enhancer (e.g., Piaf, Thermoform)	0.433	1.005	0.378	0.967
20. Scan & text-to-speech devices (e.g., Portable scan translation pen)	0.729	1.191	0.539	1.093
21. Slate and Stylus (tools used by individuals with visual impairment to write text in braille)	0.488	1.083	0.438	1.048
22. Personal digital assistant (PDA, small handheld computers)	0.891	1.288	0.775	1.330
23. Connectclip (Enables hands-free phone calls and music streaming from smartphone)	0.563	1.078	0.450	1.000
24. FM systems (wireless assistive hearing devices that enhance the use of hearing aids)	0.612	1.168	0.539	1.100
25. Speech amplification devices (e.g. ChatterVOX)	0.481	1.083	0.411	0.981
26. Hearing aids (e.g. behind-the-ear (BTE), in-the-ear (ITE), receiver-in-the-ear (RITE), in-the-canal (ITC) and CROS (Contralateral Routing of Signals)/BiCROS (Bilateral Contralateral Routing of Signals)	0.985	1.352	0.581	1.203
27. Soundproof equipment for indoors environment (i.e., equipment that improve the overall sound quality and intelligibility for individuals with hearing impairment)	0.746	1.235	0.527	1.146
28. Telecoils (or t-coil, a coil of wire that is installed inside many hearing aids and cochlear implants to act as a miniature wireless receiver)	0.492	1.057	0.419	1.005
29. Head stylus (users with mobility impairments control the stylus to interact with touchscreens or other devices)	0.488	0.993	0.442	1.015
30. Adapted keyboards (e.g. small keyboards, ergonomic)	0.899	1.363	0.628	1.153
31. Virtual keyboards/mouse	0.922	1.296	0.659	1.183
32. Adapted mouses (i.e., mouse that has been modified or designed to accommodate individuals with specific physical or cognitive challenges; e.g., ergonomic)	0.822	1.182	0.643	1.230
33. Alternative mouses (e.g. jelly-bean switches, trackball, joystick, leg switch)	0.906	1.282	0.690	1.217

Assistive-Technology Devices	**Q1**		**Q2**	
34. Sip and Puff system (users control electronic devices, such as computers or wheelchairs, by using their breath, either blowing or sucking air)	0.492	0.998	0.473	1.083
35. Remote control of computer (e.g. eye tracking system, head mouse)	0.685	1.162	0.395	0.879
36. Personal Emergency response system (i.e., typically a wearable device, equipped with an emergency button that can be pressed to request assistance)	0.884	1.361	0.594	1.213
37. Augmentative and alternative communication devices/software	0.667	1.141	0.659	1.253
38. Tactile blackboard (i.e., a raised-line drawing board)	0.760	1.236	0.563	1.189

Assistive-Technology Software/Apps	**Q1**		**Q2**	
	M	**SD**	**M**	**SD**
1. Contrast tools	0.791	1.229	0.819	1.348
2. Exe learning software	0.523	1.094	0.516	1.137
3. Voice recognition systems (e.g. ListenAll)	0.922	1.284	0.706	1.284
4. Screen reader (e.g., Jaws, VoiceOver, NVDA, TalkBack)	0.859	1.241	0.675	1.225
5. Text-to-speech applications/programs (e.g., Natural Reader, ReadAloud, VoiceDream reader)	1.046	1.375	0.677	1.168
6. Daisy-player software (e.g., Dolphin easy reader, AMIS)	0.508	1.012	0.409	0.954
7. Math-ML player (enables assistive technology such as screen readers and screen magnifiers to speak, navigate math expressions and convert to braille)	0.445	1.041	0.539	1.170
8. Ebook readers (e.g., Dolphin EasyReader, Read2go, Thorium)	0.969	1.328	0.844	1.417
9. Multifunctional text-to-speech software (e.g., Voice Dream Reader, Voice Dream Writer)	0.701	1.204	0.675	1.251
10. Screen magnification software (e.g., Supernova, Microsoft windows magnifier)	1.148	1.431	0.762	1.249
11. Braille to speech software (e.g., TELEO)	0.492	1.012	0.325	0.828
12. Braille translator/ text-to-braille software	0.441	1.066	0.232	0.674
13. Document and Word Processing software with braille translator (e.g., Biblos, Odt2braille with OpenOffice Writer)	0.465	1.118	0.417	1.072

Assistive-Technology Software/Apps	**Q1**		**Q2**	
14. Document and Word Processing software with text-to-speech conversion (e.g., Speak with MS Office)	0.740	1.170	0.622	1.188
15. Word prediction software/app	0.890	1.255	0.693	1.218
16. Word completion software/app	0.874	1.189	0.622	1.119
17. Scan & speech apps (e.g., Voice Dream Scanner)	0.579	1.162	0.433	0.956
18. Digital voice recorder	1.260	1.487	1.008	1.406
19. Talking calculator	0.698	1.154	0.680	1.279
20. Specialized Math Software (digitally allows the use of supports such as screen magnification, text-to-speech support, audio representation of graphics, and translation into Nemeth code)	0.496	1.029	0.477	1.065
21. Object identification apps	0.635	1.107	0.544	1.111
22. Color identification apps	0.484	1.049	0.402	0.937
23. Light identification apps	0.460	1.071	0.373	1.002
24. Speech-to-Text software/audio transcription apps (e.g. Dragon anywhere, Google Gboard, Apple dictation)	0.976	1.323	0.813	1.297
25. Automatic captioning software/app (Communication Access Realtime Translation (CART))	0.683	1.164	0.504	1.068
26. Voice control apps (e.g. Dragon naturally speaking)	0.484	1.033	0.583	1.178
27. Scanning input (screen scanning software/application)	0.656	1.258	0.570	1.134
28. Highlighting text application	0.864	1.227	0.606	1.156
29. Concept map program (e.g. Cmap)	0.627	1.086	0.544	1.154

Mainstream Technology	**Q1**		**Q2**	
	M	**SD**	**M**	**SD**
1. Tablet	2.992	1.283	3.242	1.025
2. Laptop	3.535	0.848	3.442	0.926
3. Personal Computer (PC)	3.194	1.335	3.426	1.059
4. Smart phone	3.414	1.076	3.354	0.988
5. Smart watches	2.656	1.342	2.260	1.460
6. MS Windows software	3.336	0.974	3.203	1.186
7. OCR (optical character recognition e.g., Abbyy Finereader)	1.865	1.597	1.719	1.521
8. Additional light sources	1.323	1.522	1.268	1.504
9. Color adjustment on screens	2.646	1.354	2.220	1.351

Mainstream Technology	**Q1**		**Q2**	
10. Audio recorder	2.819	1.281	2.727	1.240
11. Microphones	2.976	1.169	3.047	1.117
12. Accessible online (synchronous and asynchronous) communication (e.g. MS Teams, Zoom)	3.295	1.078	3.156	1.187
13. Virtual board	2.598	1.255	2.063	1.373
14. Headset/Headphones	2.961	1.405	3.031	1.210
15. Video recording software/apps (e.g., OBS)	2.110	1.465	1.810	1.361
16. Media players for video with subtitles (e.g., VLC)	2.181	1.514	2.048	1.413
17. Book scanner desktop or portable (e.g., Irispen scan)	1.913	1.480	1.946	1.491
18. Virtual assistant for setting reminders, searching and answering questions for the user. (e.g., Cortana on windows, Google assistant, Siri etc.)	1.811	1.349	1.633	1.397
19. Touch devices (interaction through touch)	2.110	1.534	2.128	1.497
20. Learning management systems (platform for all education processes - lessons, notes, exams etc.)	2.575	1.383	2.465	1.446
21. Summarizing programs (e.g. ePico!)	1.047	1.408	0.778	1.179

Existing experience in distance education of Students with Disabilities

The following table presents the results of the descriptive statistics (mean and standard deviation) of the teaching staff's responses for each of the two questions.

	M	**SD**
1. What is your experience in distance education of students with disabilities	0.787	0.923
2. To what degree are you considered to have the knowledge and experience to provide distance education for students with disabilities?	1.046	1.163

REFERENCES

[1] Guidance Notes on Project Reporting, European Commission, Community Research, Version 07/03/2008.

[2] Guide to Financial Issues relating to FP7 Indirect Actions, Community Research, Version 24/07/2008.

APPENDIX I: INSTRUCTIONS FOR INTERVIEW MODERATORS

Purpose of the study

The purpose of the survey is the evaluation of the existing knowledge and experience of teaching staff and accessibility advisors in relation to various types/forms of accessible material.

Instructions to moderators of Tests

Semi-structured interviews will be conducted with accessibility advisors and members of teaching staff. The interviews could be conducted either online or in person. The researcher needs to record (Video/Audio recording) the whole interview. Apart from the questions of the actual interview, each participant shall answer some questions on demographics/personal characteristics that need to be answered at the beginning of the interview.

For the participants' recruitment the variability in the participants' experience will be taken into consideration. That is, the sample will include participants with great experience but also participants with moderate or low experience in the development of accessible material.

Please read the instructions carefully, conduct the interview and select the correct option or fill in the answers to the respective question field.

Introductory text

Before the test begins, researchers should read aloud the following introductory text to the participants.

"The purpose of the survey is the evaluation of the existing knowledge and experience of teaching staff and accessibility advisors in relation to various types/forms of accessible material.

The procedure will be the following:

First you will be asked to answer on some questions on demographics/personal characteristics and then you will be asked to answer some questions on your existing knowledge and experience in relation to various types/forms of accessible material."

APPENDIX II: INTERVIEW - DEMOGRAPHIC QUESTIONS

Advisors

Demographic data of participants

1. Gender
   a. Male
   b. Female
2. Age (the date of birth)
3. The place of residence (and the University you teach / work at).
4. Position.
   a. Accessibility advisor
   b. Library staff
   c. Member of Accessibility Unit/Laboratory
5. Prior years of experience on accessibility related issues.
6. Do you know sign language?
7. Are you a Braille reader?
8. Do you have any expertise in special education (e.g. Seminar, Workshop, Bachelor Master, PhD etc.)?
9. If yes, how many years before you completed it?
10. Do you use assistive technology?
11. If yes, which means of assistive technology do you use (S/W or H/W, name/ list the equipment)?
12. Number of students in your University identified as having a learning disability
13. Number of students in your University identified as having a hearing impairment
14. Number of students in your University identified as having a visual impairment
15. Number of students in your University identified as having a physical/mobility impairment
16. Do you have a technology/computer support person to assist you in developing accessible material?
17. Is there any infrastructure available for the development of accessible educational material?

Teaching staff

1. Gender
   a. Male
   b. Female
2. Age (the date of birth)
3. The place of residence (and the University you Teach/Work at)
4. Position
   a. Lecturer/ Special Teaching Staff/Lab Staff/Special Technical Lab Staff
   b. Professor
5. What is your employment status as teaching staff
   a. Full time
   b. Part time
6. Main Teaching/Research subject or professional activity (e.g. Special education, Physics, Mathematics, Chemistry, Biology, History, Economics, Information Technology etc.)
7. Prior years of teaching experience.
8. Do you know sign language?
9. Do you know how to read/write Braille?
10. Do you use assistive technology?
11. If yes, which means of assistive technology do you use (S/W or H/W, name/ list the equipment)?
12. Do you have any expertise in special education (e.g. Seminar, Workshop, Bachelor, Master, PhD etc.)?
13. If yes, how many years before you completed it?
14. Number of students in your classrooms identified as having a learning disability
15. Number of students in your classrooms identified as having a hearing impairment
16. Number of students in your classrooms identified as having a visual impairment
17. Number of students in your classrooms identified as having a physical/mobility impairment
18. How many programs/ courses have you taught with Distance Education?
19. How many hours of DE courses have you taught?
20. Do you have a technology/computer support person or an accessibility advisor to assist you in implementing instructional technologies in your classroom curriculum?

APPENDIX III: INTERVIEW QUESTIONS

Interview Questions for Advisors

1. Please mention what types/forms of accessible educational material you are aware that are being used by students with disabilities (you will need to mention every type/form you are aware of, e.g. tactile maps, accessible books, etc.), irrespective if you have ever developed or if you used any. In your answer please also include any alternative types/forms of accessible material that you are aware that exist (e.g. tactile pictures printed on microcapsule paper, tactile pictures printed on a plastic sheet with thermoform, tactile pictures printed on plain 160gr weight paper with a Tiger Printer, etc.), by mentioning separately each one of the alternative forms of material.
2. Please mention what types/forms of accessible educational material you are capable to produce by yourself (i.e. you have the knowledge and experience to do so) (e.g. Tactile, audio-tactile etc.), without any help from others. In your answer please also include any alternative types/forms of accessible material.
3. Please mention if you have participated (as a teacher or as supporting personnel) in Distance Education programs/courses with Students with Disabilities as participants.
4. Please mention in how many DE programs you have created accessible materials and what was the disability/ies (eg. Visual impairments, hearing impairments etc.) of the participating students.
5. Please make a brief description of the adaptations made to the educational material, for each group of Students with Disabilities (based on their disability), in order for those programs to become accessible for the Students with Disabilities.
6. Thinking of your own professional development needs, please indicate the extent to which you have such needs in each of the areas listed
   a. Teaching students with special learning needs
   b. Creating Accessible educational material
   c. Knowledge and understanding of instructional practices of DE for SwD

Interview Questions for Teaching Staff

1. Please mention what types/forms of accessible educational material you are aware that are being used by students with disabilities (you will need to mention every type/form you are aware of, e.g. tactile maps, accessible books, etc.), irrespective if you have ever developed or if you used any. In your answer please also include any alternative types/forms of accessible material that you are aware that exist (e.g. tactile pictures printed on microcapsule paper, tactile pictures printed on a plastic sheet with thermoform, tactile pictures printed on plain 160gr weight paper with a Tiger Printer, etc.), by mentioning separately each one of the alternative forms of material.
2. Please mention what types/forms of accessible educational material you are capable to produce by yourself (i.e. you have the knowledge and experience to do so) (e.g. Tactile, audio-tactile etc.), without any help from others. In your answer please also include any alternative types/forms of accessible material.
3. Please mention if you have participated (as a teacher or as supporting personnel) in Distance Education programs/courses with Students with Disabilities as participants.
4. Please mention in how many DE programs you have participated (as teacher) and what was the disability/ies (eg. Visual impairments, hearing impairments etc.) of the participating students.
5. Please make a brief description of the adaptations made to the educational material, for each group of Students with Disabilities (based on their disability), in order those programs to become accessible for the Students with Disabilities.
6. Thinking of your own professional development needs, please indicate the extent to which you have such needs in each of the areas listed
    a. Teaching students with special learning needs
    b. Creating Accessible educational material
    c. Knowledge and understanding of instructional practices of DE for SwD

APPENDIX IV: QUESTIONNAIRES (AUTHORS: PAPADOPOULOS, K., KOUSTRIAVA, E., & ISARAJ, L.)

Questionnaire for Advisors

Below you may find a list with the different types of Accessible Educational Material. Please, answer: a) to what degree do you know (are you aware of the features of) each educational material, b) to what degree have you used each educational material, c) what is your experience in producing each educational material.

In order to answer, please, use one of the following options:

0 = not at all

1 = small

2 = medium

3 = great

4 = very great

Educational material

Accessible Printed Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
1. Large prints (included enlarged books)			
2. Braille prints (included braille books)			

Accessible Printed Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
3. Tactile books (Text and graphics)			
4. Tactile graphics/images			
5. Microcapsule paper prints (e.g., Piaf prints)			
6. Tiger embossed prints			
7. Plastic paper prints/ thermoform			
8. Relief printed material			
9. Pictures with Braille description			
10. Tactile maps			
11. Verbal descriptions in braille			
12. Raised-line paper for writing or graphing			
13. 3D printed material (by 3D printer)			

Accessible Printed Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
14. Printed material (e.g. lecture notes)			
15. Printed material with images, graphics, and visual elements			
16. Accessible text (books, notes etc.)			
17. Accessible presentations			
18. Adapted books (added tactile pieces and images/picture annotation)			
19. Printed conceptual/mental map			
20. Flash cards (a study or memorisation tool, with information on one or both sides.)			
21. Notes with mathematical equations			

Accessible Digital Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
1. Accessible word			
2. Accessible pdf			
3. Accessible presentations (Powerpoint)			
4. Accessible daisy			
5. Accessible epub			
6. Accessible excel files			
7. Ebooks			
8. Accessible books with HTML / HTML content			
9. Audio recorded material (e.g., lecture notes, books)			
10. Video recorded material (e.g. lectures)			
11. Pictures with verbal-audio description			
12. Images with alternative text			

Accessible Digital Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
13. Verbal description in audio file			
14. Digital books with legible texts (e.g., arial fonts, tahoma, san serif, helvetica)			
15. Accessible videos			
16. Videos with sign language			
17. Videos with transcriptions (including YouTube, lectures)			
18. Video with subtitles			
19. Google docs			
20. Video lessons with slow rhythm			
21. Live streaming with captions (e.g. lectures given synchronously online)			

Accessible Digital Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
22. Digital material with images, graphics, and visual elements			
23. Pictograms in digital texts			
24. Digital texts with simplified language			
25. Digital conceptual/mental maps			
26. Color corrected texts			
27. Accessible Mathematical formulas			
28. Symbolic languages			
29. Audiobooks			
30. Highlighted texts			
31. Lecture summaries			
32. Accessible websites			
33. Digital media			
34. Accessible Music			

Haptic Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
1. Haptic models (e.g., haptic pictures, graphs, maps etc, manufactured from everyday material attached onto a surface)			
2. Manipulatives (e.g., Plastic shapes/objects, Tactile globes, Tactile dolls)			

Audio-tactile material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
1. Audio-tactile pictures for IVEO/TTT (Systems with audio-tactile feedback)			

Assistive-Technology

Below you may find: 1) a list of Assistive Technology Devices and software, 2) a list including mainstream technology. Please, answer: a) To what degree are you familiar with each device/ software/app (are you aware of their feature), b) To what degree do you know how to use each device/software/app.

In order to answer, please, use one of the following options:

0 = not at all

1 = small

2 = medium

3 = great

4 = very great

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features)	To what degree do you know how to use this device
1. Hand held magnifiers (e.g., reading stone, monocular, magnifying glass)		
2. Text to speech devices (e.g., reading devices)		
3. Daisy-player device (talking book machine)		
4. Traditional Braille typewriter (e.g., Perkins, Tatrapoint)		
5. Electronic Braille typewriter (e.g., Mountbatten)		
6. Braille keyboard		
7. Notetakers (e.g., Braille N' Speak, Braille Lite)		
8. Handheld media player (e.g., Victor Reader Stream)		

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features)	To what degree do you know how to use this device
9. Touch tablet (e.g., IVEO or TTT)		
10. Refreshable Braille display		
11. Braille printer/ Embosser (e.g., Index Everest, Viewplus Tiger)		
12. CCTV (e.g., MagniLink magnifier, Onyx, Topaz, Optelec ClearView)		
13. Computer monitor magnifier (i.e., device that hooks on the screen and magnifies it)		
14. Portable CCTV/ Portable video magnifier (i.e., devices consisting of a camera, monitor, lighting and provide magnified image)		
15. Adjusted keyboards (enlarged keys, braille keys)		
16. Adapted notebooks (e.g., enlarged pages, grid paper, colored pages)		
17. Tactile-image enhancer (e.g., Piaf, Thermoform)		
18. Scan & text-to-speech devices (e.g., Portable scan translation pen)		
19. Slate and Stylus (tools used by individuals with visual impairment to write text in braille)		
20. Personal digital assistant (PDA, small handheld computers)		

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features)	To what degree do you know how to use this device
21. Connectclip (Enables hands-free phone calls and music streaming from smartphone)		
22. FM systems (wireless assistive hearing devices that enhance the use of hearing aids)		
23. Loop systems or audio induction loop (for individuals with hearing impairments)		
24. Speech amplification devices (e.g. ChatterVOX)		
25. Hearing aids (e.g. behind-the-ear (BTE), in-the-ear (ITE), receiver-in-the-ear (RITE), in-the-canal (ITC) and CROS(Contralateral Routing of Signals)/BiCROS(Bilateral Contralateral Routing of Signals))		
26. Soundproof equipment for indoors environment (i.e., equipment that improve the overall sound quality and intelligibility for individuals with hearing impairment)		
27. Telecoils (or t-coil, a coil of wire that is installed inside many hearing aids and cochlear implants to act as a miniature wireless receiver)		
28. Head stylus (users with mobility impairments control the stylus to interact with touchscreens or other devices)		

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features)	To what degree do you know how to use this device
29. Adapted keyboards (e.g. small keyboards, ergonomic)		
30. Virtual keyboards/mouse		
31. Adapted mouses (i.e., mouse that has been modified or designed to accommodate individuals with specific physical or cognitive challenges; e.g., ergonomic)		
32. Alternative mouses (e.g. jelly-bean switches, trackball, joystick, leg switch)		
33. Sip and Puff system (users control electronic devices, such as computers or wheelchairs, by using their breath, either blowing or sucking air)		
34. Remote control of computer (e.g. eye tracking system, head mouse)		
35. Personal Emergency response system (i.e., typically a wearable device, equipped with an emergency button that can be pressed to request assistance)		
36. Augmentative and alternative communication devices/software		
37. Tactile blackboard (i.e., a raised-line drawing board)		

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features)	To what degree do you know how to use this device
38. Tactile screens		

Assistive-Technology Software/Apps	To what degree are you familiar with this software/app (are you aware of its features)	To what degree do you know how to use this software/app
1. Screen reader (e.g., Jaws, VoiceOver, NVDA, TalkBack)		
2. Text-to-speech applications/programs (e.g., Natural Reader, ReadAloud, VoiceDream reader)		
3. Daisy-player software (e.g., Dolphin easy reader, AMIS)		
4. Math-ML player (enables assistive technology such as screen readers and screen magnifiers to speak, navigate math expressions and convert to braille)		
5. Ebook readers (e.g., Dolphin EasyReader, Read2go, Thorium)		
6. Multifunctional text-to-speech software (e.g., Voice Dream Reader, Voice Dream Writer)		
7. Screen magnification software (e.g., Supernova)		

Assistive-Technology Software/Apps	To what degree are you familiar with this software/app (are you aware of its features)	To what degree do you know how to use this software/app
8. Screen magnification apps (e.g., Microsoft windows magnifier)		
9. Braille to speech software (e.g., TELEO)		
10. Braille translator/ text-to-braille software		
11. Document and Word Processing software with braille translator (e.g., Biblos, Odt2braille with OpenOffice Writer)		
12. Document and Word Processing software with text-to-speech conversion (e.g., Speak with MS Office)		
13. Word prediction software/app		
14. Word completion software/app		
15. Scan & speech apps (e.g., Voice Dream Scanner)		
16. Digital voice recorder		
17. Talking calculator		
18. Specialized Math Software (digitally allows the use of supports such as screen magnification, text-to-speech support, audio representation of graphics, and translation into Nemeth code)		
19. Object identification apps		

Assistive-Technology Software/Apps	To what degree are you familiar with this software/app (are you aware of its features)	To what degree do you know how to use this software/app
20. Color identification apps		
21. Light identification apps		
22. Speech-to-Text software/audio transcription apps (e.g. Dragon anywhere, Google Gboard, Apple dictation)		
23. Voice recognition systems (e.g. ListenAll)		
24. Automatic captioning software/app (Communication Access Realtime Translation (CART))		
25. Voice control apps (e.g. Dragon naturally speaking)		
26. Scanning input (screen scanning software/application)		
27. Highlighting text application		
28. Accessible calculators		
29. Concept map program (e.g. Cmap)		
30. Reminder app/calendar with notifications		
31. Spell checker/word correction programs		
32. Time management apps		

Assistive-Technology Software/Apps	To what degree are you familiar with this software/app (are you aware of its features)	To what degree do you know how to use this software/app
33. EDICO (a Scientific Editor specifically designed for the blind)		
34. Atkinson Hyper Legible font		

Mainstream Technology	To what degree are you familiar with this device (are you aware of its features)	To what degree do you know how to use this device
1. Tablet		
2. Laptop		
3. Personal Computer (PC)		
4. MS Windows software		
5. Scanner		
6. OCR (optical character recognition e.g., Abby FineReader)		
7. Cell phone		
8. Smart phone		
9. Additional light sources		
10. Color adjustment on screens		

Mainstream Technology	To what degree are you familiar with this device (are you aware of its features)	To what degree do you know how to use this device
11. Audio recorder		
12. Microphones		
13. Accessible online (synchronous and asynchronous) communication (e.g. MS Teams, Zoom)		
14. Virtual board		
15. Headset/Headphones		
16. Video recording software/apps (e.g. OBS)		
17. Media players for video with subtitles(e.g. VLC)		
18. Book scanner desktop or portable (e.g. Irispen scan)		
19. Cortana on windows (virtual assistant for setting reminders, searching and answering questions for the user)		
20. Email apps		
21. Touch devices (interaction through touch)		
22. Smart watches		
23. Clocks		
24. Word processing software		

Mainstream Technology	To what degree are you familiar with this device (are you aware of its features)	To what degree do you know how to use this device
25. Pad and pen		
26. Learning management systems (platform for all education processes - lessons, notes, exams etc)		
27. Summarizing programs (e.g. ePico!)		
28. Digital dictionaries		

Existing experience in distance education of Students with Disabilities

Below you may find Questions about existing experience in distance education of Students with Disabilities

In order to answer, please, use one of the following options:

0 = not at all

1 = limited

2 = moderate

3 = extensive

4 = very extensive

Question	Answer
1. What is your experience in distance education of students with disabilities	Likert score
2. To what degree are you considered to have the knowledge and experience to provide distance education for students with disabilities?	Likert score

Demographic information

1. Age: (number)
2. Gender: 1. Male, 2. Female
3. Nationality (text)
4. How many years do you work as an accessibility advisor? (number)
5. Have you attended a bachelor/seminar/postgraduate program concerning teaching of students with disabilities, accessibility or the production of accessible material?
   1. Yes, 2. No
6. If yes, please specify: 1. bachelor, 2. seminar, 3. postgraduate

Questionnaire for Teaching Staff

Below you may find a list with the different kinds of Accessible Educational Material. Please, answer: a) to what degree do you know (are you aware of the features of) each educational material, b) to what extent have you used each educational material, c) what is your experience in producing each educational material.

In order to answer, please, use one of the following options:

0 = not at all

1 = small

2 = medium

3 = great

4 = very great

Educational material

Accessible Printed Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
1. Braille prints (included braille books)			
2. Large prints (included enlarged books)			
3. Tactile books (Text and graphics)			
4. Tactile graphics/images			
5. Tactile maps			
6. Printed conceptual/mental map			
7. Microcapsule paper prints (e.g., Piaf prints)			
8. Tiger embossed prints			
9. Plastic paper prints/ thermoform			
10. 3D printed material (by 3D printer)			
11. Pictures with Braille description			

Accessible Printed Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
12. Adapted books (added tactile pieces and images/picture annotation)			
13. Accessible text (books, notes etc.)			

Accessible Digital Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
1. Accessible word			
2. Accessible pdf			
3. Accessible presentations (Powerpoint)			
4. Accessible daisy			
5. Accessible epub			
6. Accessible excel files			

Accessible Digital Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
7. Ebooks			
8. Digital books with legible texts (e.g., arial fonts, tahoma, san serif, helvetica)			
9. Digital texts with simplified language			
10. Audio recorded material (e.g., lecture notes, books)			
11. Audiobooks			
12. Pictures with verbal-audio description			
13. Images with alternative text			
14. Videos with sign language			
15. Videos with transcriptions (including YouTube, lectures)			
16. Videos with subtitles			

Accessible Digital Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
17. Live streaming with captions (e.g., lectures given synchronously online)			
18. Digital conceptual/mental maps			
19. Color corrected texts			
20. Multimodal material (e.g., mixture of linguistic, visual, gestural, spatial and audio elements)			
21. Serious games (the educational process takes part through the game)			
22. METACOM symbols (Augmentative and Alternative Communication (AAC))			
23. Accessible mathematical equations			

Haptic Material	To what degree do you know (are you aware of the features of) this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
1. Haptic models (haptic pictures, graphs, maps etc, manufactured from everyday material attached onto a surface)			
2. Manipulatives (Plastic shapes/objects, Tactile globes, Tactile dolls)			

Audio-tactile material	To what degree do you know (are aware of) and/or use this educational material	To what degree have you used this educational material	What is your experience in producing this type of educational material?
1. Audio-tactile pictures for IVEO/TTT (Systems with audio-tactile feedback)			

Assistive-Technology

Below you may find: 1) a list of Assistive Technology Devices and software, 2) a list including mainstream technology. Please, answer: a) To what degree are you familiar with each device (are you aware of their features), b) To what degree do you know how to use each device.

In order to answer, please, use one of the following options:

0 = not at all

1 = small

2 = medium

3 = great

4 = very great

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features).	To what degree do you know how to use this device
1. Tactile screens		
2. Loop systems or audio induction loop (for individuals with hearing impairments)		
3. Hand held magnifiers (e.g., reading stone, monocular, magnifying glass)		
4. Text to speech devices (e.g., reading devices)		
5. Daisy-player device (i.e., talking book machine)		
6. Traditional Braille typewriter (e.g., Perkins, Tatrapoint)		
7. Electronic Braille typewriter (e.g., Mountbatten)		
8. Braille keyboard		

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features).	To what degree do you know how to use this device
9. Notetakers (e.g., Braille N' Speak, Braille Lite)		
10. Handheld media player (e.g., Victor Reader Stream)		
11. Touch tablet (e.g., IVEO or TTT)		
12. Refreshable Braille display		
13. Braille printer/ Embosser (Index Everest, Viewplus Tiger)		
14. CCTV (e.g., MagniLink magnifier, Onyx, Topaz, Optelec ClearView)		
15. Computer monitor magnifier (i.e., device that hooks on the screen and magnifies it)		
16. Portable CCTV/ Portable video magnifier (i.e., devices consisting of a camera, monitor, lighting and provide magnified image)		
17. Adjusted keyboards (enlarged keys, braille keys)		
18. Adapted notebooks (e.g., enlarged pages, grid paper, colored pages)		
19. Tactile-image enhancer (e.g., Piaf, Thermoform)		
20. Scan & text-to-speech devices (e.g., Portable scan translation pen)		

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features).	To what degree do you know how to use this device
21. Slate and Stylus (tools used by individuals with visual impairment to write text in braille)		
22. Personal digital assistant (PDA, small handheld computers)		
23. Connectclip (Enables hands-free phone calls and music streaming from smartphone)		
24. FM systems (wireless assistive hearing devices that enhance the use of hearing aids)		
25. Speech amplification devices (e.g. ChatterVOX)		
26. Hearing aids (e.g. behind-the-ear (BTE), in-the-ear (ITE), receiver-in-the-ear (RITE), in-the-canal (ITC) and CROS(Contralateral Routing of Signals)/BiCROS(Bilateral Contralateral Routing of Signals))		
27. Soundproof equipment for indoors environment (i.e., equipment that improve the overall sound quality and intelligibility for individuals with hearing impairment)		
28. Telecoils (or t-coil, a coil of wire that is installed inside many hearing aids and cochlear implants to act as a miniature wireless receiver)		

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features).	To what degree do you know how to use this device
29. Head stylus (users with mobility impairments control the stylus to interact with touchscreens or other devices)		
30. Adapted keyboards (e.g. small keyboards, ergonomic)		
31. Virtual keyboards/mouse		
32. Adapted mouses (i.e., mouse that has been modified or designed to accommodate individuals with specific physical or cognitive challenges; e.g., ergonomic)		
33. Alternative mouses (e.g. jelly-bean switches, trackball, joystick, leg switch)		
34. Sip and Puff system (users control electronic devices, such as computers or wheelchairs, by using their breath, either blowing or sucking air)		
35. Remote control of computer (e.g. eye tracking system, head mouse)		
36. Personal Emergency response system (i.e., typically a wearable device, equipped with an emergency button that can be pressed to request assistance)		

Assistive-Technology Devices	To what degree are you familiar with this device (are you aware of its features).	To what degree do you know how to use this device
37. Augmentative and alternative communication devices/software		
38. Tactile blackboard (i.e., a raised-line drawing board)		

Assistive-Technology Software/Apps	To what degree are you familiar with this software/app (are you aware of its features).	To what degree do you know how to use this software/app
1. Contrast tools		
2. Exe learning software		
3. Voice recognition systems (e.g. ListenAll)		
4. Screen reader (e.g., Jaws, VoiceOver, NVDA, TalkBack)		
5. Text-to-speech applications/programs (e.g., Natural Reader, ReadAloud, VoiceDream reader)		
6. Daisy-player software (e.g., Dolphin easy reader, AMIS)		

Assistive-Technology Software/Apps	To what degree are you familiar with this software/app (are you aware of its features).	To what degree do you know how to use this software/app
7. Math-ML player (enables assistive technology such as screen readers and screen magnifiers to speak, navigate math expressions and convert to braille)		
8. Ebook readers (e.g., Dolphin EasyReader, Read2go, Thorium)		
9. Multifunctional text-to-speech software (e.g., Voice Dream Reader, Voice Dream Writer)		
10. Screen magnification software (e.g., Supernova, Microsoft windows magnifier)		
11. Braille to speech software (e.g., TELEO)		
12. Braille translator/ text-to-braille software		
13. Document and Word Processing software with braille translator (e.g., Biblos, Odt2braille with OpenOffice Writer)		
14. Document and Word Processing software with text-to-speech conversion (e.g., Speak with MS Office)		
15. Word prediction software/app		
16. Word completion software/app		
17. Scan & speech apps (e.g., Voice Dream Scanner)		

Assistive-Technology Software/Apps	To what degree are you familiar with this software/app (are you aware of its features).	To what degree do you know how to use this software/app
18. Digital voice recorder		
19. Talking calculator		
20. Specialized Math Software (digitally allows the use of supports such as screen magnification, text-to-speech support, audio representation of graphics, and translation into Nemeth code)		
21. Object identification apps		
22. Color identification apps		
23. Light identification apps		
24. Speech-to-Text software/audio transcription apps (e.g. Dragon anywhere, Google Gboard, Apple dictation)		
25. Automatic captioning software/app (Communication Access Realtime Translation (CART))		
26. Voice control apps (e.g. Dragon naturally speaking)		
27. Scanning input (screen scanning software/application)		
28. Highlighting text application		

Assistive-Technology Software/Apps	To what degree are you familiar with this software/app (are you aware of its features).	To what degree do you know how to use this software/app
29. Concept map program (e.g. Cmap)		

Mainstream Technology	To what degree are you familiar with this device (are you aware of its features).	To what degree do you know how to use this device
1. Tablet		
2. Laptop		
3. Personal Computer (PC)		
4. Smart phone		
5. Smart watches		
6. MS Windows software		
7. OCR (optical character recognition e.g., Abby FineReader)		
8. Additional light sources		
9. Color adjustment on screens		
10. Audio recorder		
11. Microphones		

Mainstream Technology	To what degree are you familiar with this device (are you aware of its features).	To what degree do you know how to use this device
12. Accessible online (synchronous and asynchronous) communication (e.g. MS Teams, Zoom)		
13. Virtual board		
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18. Virtual assistant for setting reminders, searching and answering questions for the user. (e.g., Cortana on windows, Google assistant, Siri etc.)		
19. Touch devices (interaction through touch)		
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21. Summarizing programs (e.g. ePico!)		

Existing experience in distance education of Students with Disabilities

Below you may find Questions about existing experience in distance education of Students with Disabilities

In order to answer, please, use one of the following options:

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3 = extensive

4 = very extensive

Question	Answer
What is your experience in distance education of students with disabilities	
To what degree are you considered to have the knowledge and experience to provide distance education for students with disabilities?	

Demographic information

1. Age: (number)
2. Gender:
   1. Male, 2. Female
3. Nationality (text)
4. How many years do you work as a professor/teaching staff? (number)
5. Have you attended a bachelor/seminar/postgraduate program concerning teaching of students with disabilities?
   1. Yes, 2. No
6. If yes, please specify: 1. bachelor, 2. seminar, 3. postgraduate