

How Are We Teaching and Dealing with Accessibility? A Survey From Switzerland

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ABSTRACT

The need to better understand how to support and provide accessibility has increased dramatically in recent years, whether in industry or education. Higher education institutions have an essential role in raising awareness of how important accessibility is and, at the same time, can provide students with examples of good practice in building inclusive experiences. This work aims to assess the state of the art of accessibility in Switzerland, from teaching to administrative staff. Our findings show that the majority (77%) do not teach accessibility because it is not a core part of their courses and 21% declared to don't know enough to teach. 62,5% of who is teaching accessibility teach to evaluate web pages accessibility standards and heuristics and half of them help understanding technology barriers faced by people with disabilities. Likewise, our administrative staff respondents had four times more guidelines to deal with physical access than with technology enhancements. We also found out that with the COVID-19 outbreak, our instructors mainly used extra software and were more available online. CCS CONCEPTS •Human-centered computing → Accessibility theory, concepts and paradigms; •Accessibility technologies; •Social and professional topics → People with disabilities.

KEYWORDS

Accessibility, Teaching, Administrative Staff, Students, COVID-19, Inclusion

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1 INTRODUCTION

With the development of new technologies, software and hardware started to be adapted for all users' access. Accessibility is the keyword for that, and it is essential for inclusion and ease of use.

Unfortunately, the knowledge of what accessibility is and how it can be achieved is still not widespread. Many institutions and

companies do not deal with the topic with enough rigor. Students often do not learn explicitly about accessibility, which would be extremely important to facilitate all users' access.

According to the World Health Organization, there are more than one billion people in the world living with some form of disability. People with disabilities have significantly lower information and communication technology use rates than non-disabled people [18].

The involvement of people with a disability or impairment has a direct positive effect on accessibility development. The use of screen readers, alt text, color contrast, and different font size are a few examples of what can be improved, making it easier to see, concentrate, and hear the content.

Accessibility is taught as a subject in Higher Education, seeking inclusion and quality user experiences for everyone, including accessibility in the curriculum is supported by the profession's code of conduct [1]. In comparison, we can also be dealing with accessible teaching, which are the strategies to make accessible course materials and enhance access for all learners.

It has an essential impact on learning. Through accessible technology, personalized learning makes a positive impact on students. It becomes an integral part of the learning process, allowing for genuinely equal educational opportunities.

Initiatives like Teach Access [16] represent the increasing demand for accessibility knowledge in a collaboration of educational institutions, the technology industry, and advocates for people with disabilities. Their purpose is to make the fundamentals of digital accessibility a more significant part of undergraduate education.

Other significant initiatives, such as World Wide Web Consortium (W3C), publish several web accessibility guidelines in cooperation with individuals and organizations worldwide. Their goal is to provide a set of recommendations for web content accessibility, primarily for people with disabilities.

In this paper, we targeted Higher Education Institutions in Switzerland, a small country with a long tradition of higher education and a high percentage of international students, professors, lecturers, and researchers.

Switzerland has twelve universities and nine universities of applied sciences and arts. Some of these institutions do not have technology-related courses. Considering the accessibility topic in Higher Education Institutions, we want to discover:

- RQ1: Who is teaching accessibility?
- RQ2: What barriers do faculty see to teaching accessibility?
- RQ3: How are administrative staff dealing with accessibility?
- RQ4: What changed about accessibility during the COVID-19 emergency?

To answer these questions, we designed and distributed an anonymous survey inviting Professors, Lecturers, Researchers, and Administrative Staff in Swiss Higher Education Institutions with

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technology-related courses and faculties. We will analyze and discuss our findings in this paper.

2 RELATED WORKS

This work was inspired by a survey of the United States' computing faculties [14]. They found that the absence of clear and discipline-specific accessibility learning objectives and the lack of faculty knowledge were the most critical barriers to teaching topics related to accessibility.

There are other relevant surveys about accessibility, such as perceptions of web accessibility [19], the state of library services for people with disabilities [5], and web accessibility evaluation tools spotting weaknesses and differences [9]. Likewise, we can find surveys about accessibility awareness of web developers [7] and an accessibility and usability survey for people with sensory disabilities [3].

When looking at methods for teaching accessibility, there are no many contributions in literature. We can find works about teaching accessibility in software engineering courses [8], in a technology design course [13], or as part of introducing web development [11].

Additionally, works are looking for best practices for teaching accessibility in university classrooms [10], enhancing accessibility in museums [15], case studies to help leaders decide how to add accessibility into the information and communication technology curriculum [12], MOOCs in higher education [2], and including accessibility within and beyond undergraduate computing course [17].

Large scale and faculty adoption come through social and instructional discussion. Attempts to develop curriculum strategies should consider curriculum components' patterns [4] to understand that institutional culture could enhance or block curriculum changes [6].

A survey can fill the existing knowledge gap as in [14], and our work addresses Switzerland's local situation.

3 THE SURVEY

We invited Professors, Lecturers, Researchers, and Administrative Staff in Swiss Higher Education Institutions (Universities and Universities of Applied Sciences and Arts) with technology-related courses and faculties to answer an anonymous Survey about Accessibility in Switzerland. Answering all questions took in total around 5 minutes.

First, we created a list of all 21 Swiss Institutions and searched for Professors, Lecturers, and Researchers teaching accessibility. We also got generic Information e-mail (e.g., info@usi.ch) from the Technology Institutions Departments, and the contact of Administrative Staff, Equal Opportunities, Disability and Equality offices. They were all invited by e-mail, asking for participation in a Survey. We also stated that if they were not the right person to answer, we kindly asked if they could forward it to the right colleagues.

We sent 69 e-mails in total, with 48 being for Professors, Lecturers, Researchers, and Administrative Staff, and 21 being for Information, Equal Opportunities, and Computer Science Departments. We received 74 responses, 56 of them full responses, and 18 partial responses, which we did not include in our analysis. The e-mails were sent in two batches: one original request and another as a

reminder. The first batch with 23 answers, 18 of them valid. The second batch of e-mails sent one week later resulted in 49 responses, 38 validated.

The survey started with a consent form. If the respondent agreed to participate, the first section was the Characterization. We asked their gender, age, occupation, where they are currently working, their research area, and if they identify as having a disability.

Our questionnaire had different paths for participants. Professors, Lecturers, and Researchers after the Characterization were conducted to the Teaching section, while Administrative staff answered a block of questions about their administrative career in Swiss Higher Institutions. To easily compare the results, some of our queries have initially been performed by the US survey. We rounded most of our percentage information to fit on this paper.

4 ANALYSIS & RESULTS

In Table 1, we can see the total number of participants that teach accessibility, the ones that do not, and the Administrative staff. Also, we can see their gender and whether they identify as having a disability.

In the teaching section, we asked about their experience. We had responses teaching from 1 to 37 years (with a Standard Deviation of 9,62 and a Medium of 12,87). 83% of the participants never led accessibility topics, and 17% did. Three participants identified as having a disability, one of them teaching accessibility topics.

4.1 RQ1: Who is teaching accessibility?

Among our respondents, those involved in teaching were slightly older and with a similar teaching experience than those who are not teaching (Medium of 12 years for who is teaching and 13,05 for who is not). They are distributed in 6 different cantons. 50% of them are mainly from the Human-Computer Interaction research area, with 37,5% in Intelligent Systems and 25% in Graphics & Visualization. We can see in Figure 1 the accessibility learning objectives of their courses.

Most of them, 62,5%, teach to evaluate web page accessibility standards and heuristics (compared to 36,5% in the US study). Half of them help understanding technology barriers faced by people with disabilities (66,1% in US). 37,5% Understand design concepts (65,9% in US), while 25% employ design techniques and develop accessible web technologies (35,2% in US). 25% also employ design techniques (35,2% in US) and develop accessible web technologies (36% in US). Lastly, 12,5% understand the different models of disability (15,2% in US) and engage with individuals from diverse populations appropriately (40% in US).

This survey helped us defining the main differences between the two countries. Switzerland has more focus on evaluating web pages by accessibility standards and heuristics and has a less visible focus on design concepts and engaging with individuals from diverse populations appropriately.

Participants had a mean time of 3,75 years of teaching accessibility. They also responded to what methods they use to teach the topic. 88% use in-class activities, lectures, and class meetings; 50% use team projects, and 38% homework assignments. We noticed that they use way fewer individual projects and simulation exercises than their teaching strategy in general.

Table 1: Gender and Identification as having a disability from Participants

	Total	Gender			Identify as having a disability		
		Female	Male	Prefer not to say	Female	Male	Prefer not to say
All respondents	56	17 (30%)	38 (68%)	1 (2%)	1 (2%)	3 (5%)	1 (2%)
Who Teach	8	2 (25%)	6 (75%)	-	-	1 (13%)	-
Who Do Not	39	7 (18%)	32 (82%)	-	-	2 (5%)	-
Administrative	9	8 (89%)	-	1 (11%)	1 (11%)	-	1 (11%)

LEARNING OBJECTIVES OF WHO TEACHES ACCESSIBILITY TOPICS

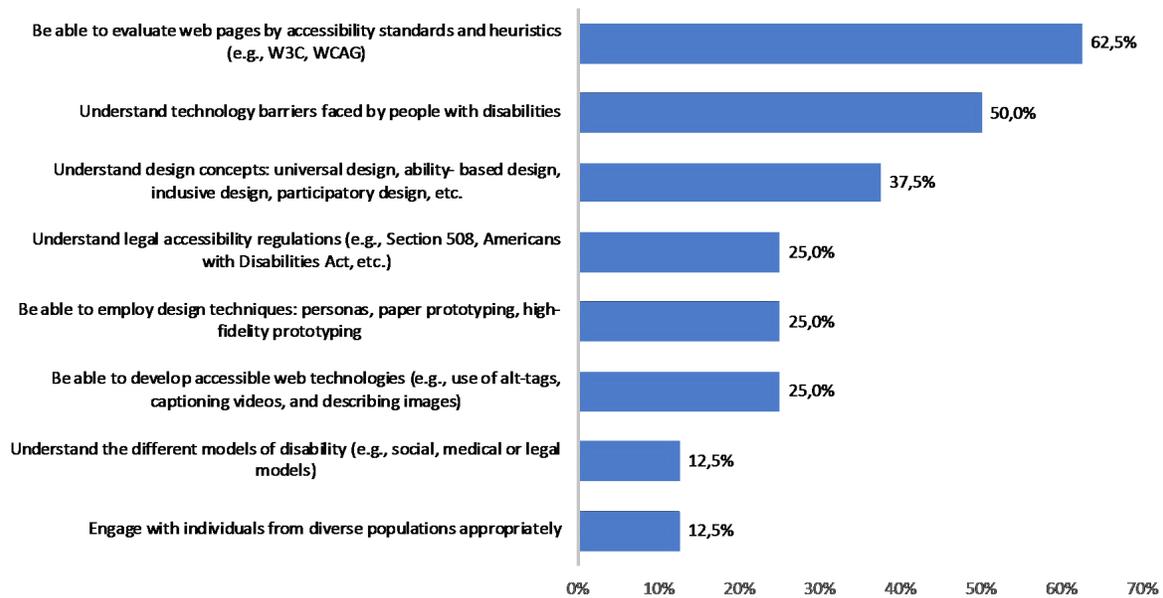


Figure 1: Learning objectives of who teaches the course incorporating accessibility topics have.

4.2 RQ2: What barriers exist?

When we asked about the barriers that professionals face incorporating accessibility topics in teaching, the majority (77%) do not teach because it is not a core part of their courses (52,3% in US). 21% don't know enough to teach (49,1% in US), 9% lack appropriate textbook (14,9% in US) and also 9% lack students and administrator awareness (14,1% in US). 6% have difficulty engaging students (10,2% in US), while 4% see a lack of demand in the industry (8,2% in US). In Figure 2, we can see all of this data in a bar chart.

Regarding the "Other" alternative, the participants explained what these barriers would be. One respondent said that his "class is not adapted", possibly to cover accessibility issues, and another said that does not face obstacles so far.

Just analyzing the answers provided by teaching personnel, we found that 62,5% have barriers incorporating accessibility topics because they are not a core part of the teaching topics. 25% on students and administrator awareness and 12,5% engaging students.

All respondents provide slides as materials to students. 63% provide books and 38% papers. Likewise, 25% provide access to videos and codes.

The methods and pedagogies also change when accessibility topics are being taught compared to general teaching. The majority of people teaching accessibility, 88%, use in-class activities, lectures, and class meetings. 50% adopt team projects, and 38% use homework assignments. On the contrary, the general teaching pedagogies include individual projects (62%) and simulation exercises (36%), lacking in accessibility topics.

4.3 RQ3: How are administrative staff dealing with accessibility?

We found out that 80% of administrative staff use guidelines to deal with physical access (room bookings, ramps for wheelchairs, etc). But just 20% have guidelines to deal with technology (screen readers, alt text, etc). 75% have support from experts or people with similar experience, and all provide access to caretakers.

They consider their knowledge about accessibility limited (56%), average (11%), or good (33%). No respondent considers their knowledge insufficient or excellent. We can see in Table 2 a comparison of all participants about having colleagues, acquaintances, friends, or family with disabilities.

BARRIERS INCORPORATING ACCESSIBILITY TOPICS

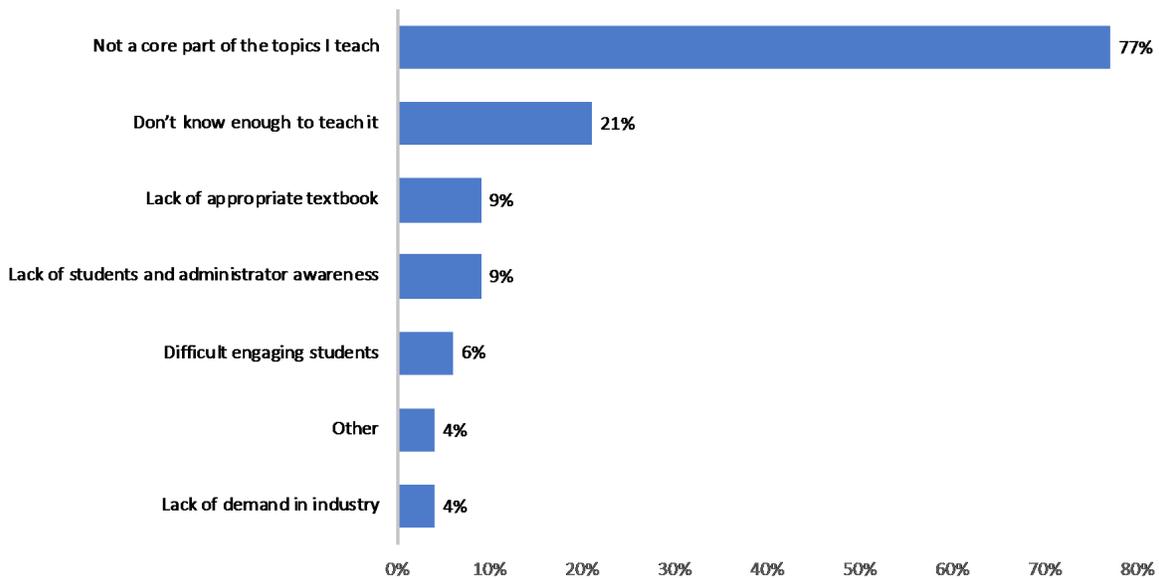


Figure 2: Barriers that Professors, Lecturers, and Researchers face incorporating accessibility topics in teaching.

Table 2: Participants having colleagues, acquaintances, friends, or family with disabilities

	No	Yes,					
		Vision impaired	Physical disabled	Deaf or hard of hearing	Mental health conditions	Intellectual disabled	Autistic
All respondents	29 (52%)	7 (13%)	18 (32%)	9 (16%)	8 (14%)	3 (5%)	6 (11%)
Who Teach	4 (50%)	2 (25%)	3 (38%)	1 (13%)	1 (13%)	-	-
Who Do Not	21 (54%)	3 (8%)	13 (33%)	5 (13%)	5 (13%)	3 (8%)	3 (8%)
Administrative	4 (44%)	2 (22%)	2 (22%)	3 (33%)	2 (22%)	-	3 (33%)

4.4 RQ4: What changed about accessibility during COVID-19?

We asked participants about how their teaching changed during the COVID-19 emergency. 84% said they asked students to use extra software (Teams, Zoom, etc.), 60% made themselves more available through audio/video platforms, and 49% used different ways to assess their work. Also, 27% were more available through forums, 24% regularly check the students' well-being, and 4% delivered extra available hardware (Tablets, Smartphones, Arduino, etc.) to students. Other responses included no changes (1 person) and currently not teaching (3 people).

When we asked all participants if they believe that accessibility will acquire a newly prominent role in education with COVID-19, 17% strongly agree, 30% somewhat agree, 39% neither agree nor disagree, 13% somewhat disagree, 2% strongly disagree. We can see this data compared in Figure 3

5 CONCLUSIONS

This article analyzed the way accessibility is thought and put into practice in higher education institutions in Switzerland. The curriculum's lack of accessibility topics is mirrored in professionals admitting they do not teach the topic (77% against 52,2% in US). More than half of the participants agreed that accessibility should be taught as part of Computer Science.

Most of them, 62,5%, teach to evaluate web page accessibility standards and heuristics (compared to 36,5% in the US study). Half of them also focused on understanding technology barriers faced by people with disabilities (66,1% in US).

Our administrative staff respondents had four times more guidelines to deal with physical access than technology enhancements. Finally, for the COVID-19 outbreak, the instructors mainly used extra software and were more available online, while 49% used different ways to assess their work.

Overall, when comparing the Swiss with the American study, we can see a lot of similarities. Thus, it is clear how more work is needed to make accessibility indeed a core topic of the computer science curriculum in higher education.

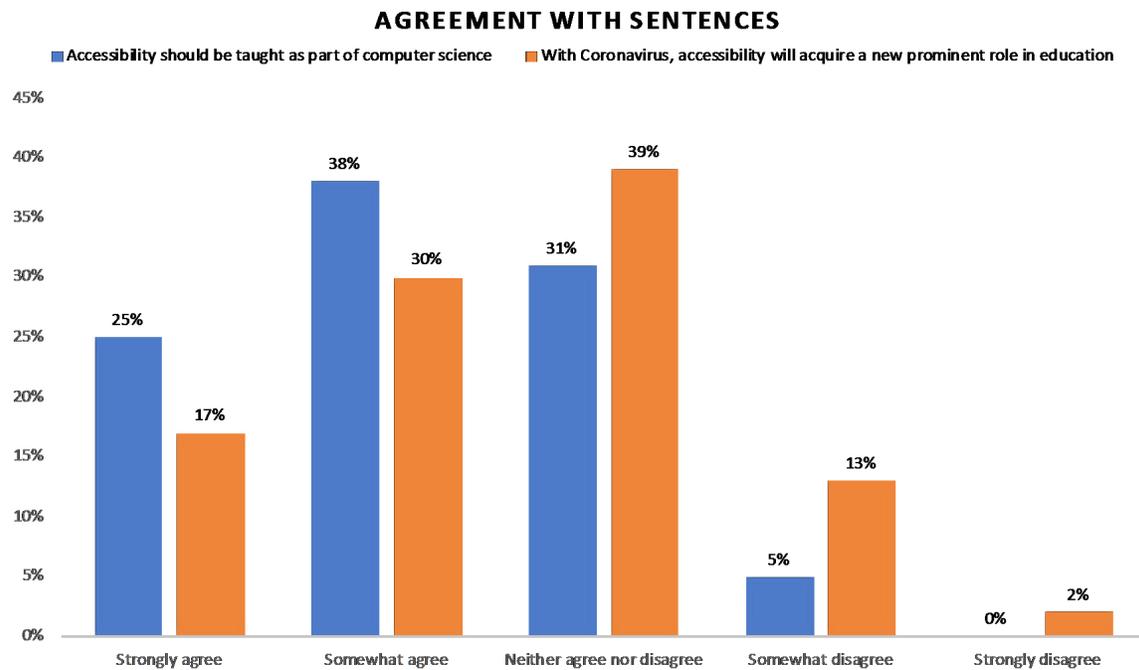


Figure 3: Agreement rate with sentences: "Accessibility should be taught as part of computer science" and "With COVID-19, accessibility will acquire a new prominent role in education".

A shift is needed where accessibility becomes paramount, not just desirable but essential and fundamental to any design process. Academics and policymakers should take a clear step towards the promotion of accessibility as a compulsory subject.

Suppose we want systems and UI to be genuinely accessible. In that case, we need to educate future engineers and designers to understand what that entails and be prepared to put it at the core of the products they will deliver.

This study's limitations include the survey written in English, lingua franca of Informatics, where most of our respondents might not be native speakers. Also, in our open questions, we received very concise answers, which could be because of the language barrier and the complexity of the questions.

We plan to interview some respondents to get a deeper understanding of existing barriers and teaching accessibility opportunities in future work. Also, we plan to collect good practice examples. This survey is only the beginning, a prior study to enhance accessibility in the Swiss educational system. As a country with four official languages and English being often spoken as a common one, we plan to discover and enhance this topic.

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