Workplace approaches to teaching digital accessibility: establishing a common foundation of awareness and understanding

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Accessibility in the digital world is a shared responsibility, requiring a common foundation of awareness and understanding. However, little is known about how digital accessibility can be effectively taught, and research on workplace teaching and training in accessibility is highly scarce, despite its crucial role in building accessibility capacity in the workforce. This paper considers workplace accessibility pedagogy to focus on aspects of foundational education, characterized as a pedagogically informed set of teaching strategies, cultivated through organizational and workplace cultures and practices. It contributes an analysis and synthesis of pedagogic research with 55 experienced accessibility educators in higher education and the workplace, in the UK and internationally, drawing on insights from expert panel methods including interviews, forums and focus groups. We find that digital accessibility is identified as a necessary core competency for an inclusive digital world. We examine the prevalent approaches that experienced workplace educators use to establish foundational awareness and understanding of accessibility to enable learners to achieve core learning objectives. We report the challenges that workplace educators face, negotiating different contexts and working practices and adapting foundational learning experiences to meet the pedagogic demands of different roles, responsibilities, and specialist advancement. In doing so, we demonstrate that establishing a common foundation of awareness and understanding is the basis for a pedagogic framework for digital accessibility education, with relevance for both workplace and academic settings.

KEYWORDS

accessibility, teaching, pedagogy, computing, education, training, industry, professionals

Introduction

Digital technologies increasingly mediate our access to education, work, and family and friends. Technology-mediated access to services, programs, and activities has the potential for greater inclusion, through greater adaptability, flexibility, personalization, and assistive technology. However, many aspects of our digital world remain out of reach to many due to a lack of accessibility. This digital divide persists, threatening greater exclusion across society. The damaging impact of the digital divide for people with disabilities was particularly evident during the COVID-19 pandemic (Gleason et al., 2020; Goggin and Ellis, 2020; Rosenblum et al., 2020).

The social model of disability demonstrates how "disability" as an experience of disadvantage and marginalization is socially constructed, rather than being an individual, medical deficit. In 1976 the Union of the physically impaired against segregation established the fundamental principles of disability, stating: "Disability is something imposed on top of our impairments by the way we are unnecessarily isolated and excluded from full participation in society" (UPIAS, 1976, p. 14). This identifies how the experience of exclusion by people who have (or are perceived to have) "impairments" (Lawson and Beckett, 2021) is both socially constructed and contextually contingent. The social model of disability inducts a project of barrier-removal. In view of this, accessibility is not simply "access to…" or "access by…"; Accessibility is a deliberate, informed effort to account for a broad range of functional needs, so that people with impairments are not disabled by our works and acts.

Accessibility in the digital context identifies modes of designing, developing, and using digital technologies, such as websites, applications, apps, and devices, to maximize their capacity to provide broad and equal access to information, interactions, and communications. For digital services and products to be inclusive, designers, developers, content authors, and others contributing to their development must have the knowledge and skills to successfully fulfill their accessibility roles (Horton, 2022).

Currently, technical barriers to inclusive practice can be conceived as a lack of awareness, as many technology professionals are unaware that accessibility is a critical factor of their professional practice. Whilst data is somewhat limited, surveys of professionals and employers in the technology industry report a significant lack of awareness of accessibility in staffing and recruitment (PEAT, 2018) and technology professionals are reportedly unfamiliar with accessibility guidelines and laws and how they are applied (see e.g., Patel et al., 2020 on software development).

From this starting point, the urgent task of defining, establishing, and sustaining foundational awareness and understanding of digital accessibility must be approached strategically in academic and workplace education programs. Accessibility is increasingly recognized as a shared endeavor between academia and the workplace (Coverdale et al., 2022). Devising a platform for foundational learning calls for a focus on critical aspects of digital accessibility education guided by proven pedagogic approaches to effective teaching and learning.

In this paper we report from new research with expert and experienced digital accessibility educators in academic and workplace contexts to identify ways forward to develop digital accessibility capacity for a more inclusive digital world. Specifically, we focus on workplace perspectives on teaching digital accessibility fundamentals to establish a common foundation of accessibility awareness and understanding with learners across a range of domains, roles and organizations—what we identify as a "foundational approach" to digital accessibility. Examining "foundational" workplace pedagogies provides important insights for evidence-based teaching and capacity building, responding to a pressing need to better understand how accessibility can be effectively taught across a range of contexts.

Research in digital accessibility education

There is a growing literature on the teaching and learning of accessibility in higher education in computer science and other technical disciplines. However, reviews of the literature highlight that accessibility education research remains relatively limited respective to other areas of education and (for example) computer science education (see Lewthwaite and Sloan, 2016; Nishchyk and Chen, 2018; Baker et al., 2020; Lewthwaite et al., 2020). In part, this signals to the precarity of digital accessibility as a field of learning. In academic programs, accessibility is often positioned as a separate module or topic, not part of core curriculum, and not embedded into relevant disciplines and subject areas (Jia et al., 2021). In a major survey of US computer science faculty, Shinohara et al. (2018) found the regularity of teaching accessibility varied widely, with only 2.9% of respondents teaching the topic more than one course per semester or quarter, while "The majority of faculty taught a course with accessibility content once a year (55.5%)". Concerningly, 23.2% reported teaching accessibility less than once a year. Further, accessibility is typically included only in elective courses and as such is "commonly dropped" by students (Baker et al., 2020). As Putnam et al. (2016) note, "if accessibility is optional or an elective, it continues to send the message that it is not a priority for our future designers, developers, and engineers." (Putnam et al., 2016, p. 19).

Also in Shinohara et al. (2018), responses on modes of delivery also gesture to the predominancy of surface, rather than deep, engagement with accessibility topics, with the majority of respondents positioning accessibility as comprising "part of a lecture," "a few classes" or for 16% an occasional informal class mention. Notably, comparative data for (for example) the UK, India or other territories, are not available. For this reason, the current prevalence of accessibility within formal higher education is hard to assess.

While there are leading academic centers of excellence in digital accessibility internationally, there remains a real concern that accessibility expertise is not effectively embedded within computer sciences at the vast majority of higher education institutions. Moreover, Shinohara et al. (2018) found that where there is a will toward teaching accessibility, many faculty question their own efficacy as accessibility educators, expressing lack of expertise and sub-area specific materials, and positioning of accessibility outside of the core curriculum as central challenges. These challenges are significant. As Putnam et al. (2016) observe:

> If only instructors who have experience with accessible computing are capable or motivated to teach the topic, what does this mean for the ability to build and sustain courses and programs? If there is only a small group of people teaching these topics, what are the missed opportunities for students and therefore the impacts to development of better systems for people with disabilities? (Putnam et al., 2016, p. 19).

Within the workplace, this situation could be different. Specifically, digital accessibility specialists have the necessary experience with accessible computing and the topic expertise required for content knowledge in teaching. However, research-led analysis of the state of workplace accessibility education is

highly scarce, arguably leading to a lack of insight into teaching knowledge and the pedagogic practices of workplace educators. Instead, blog posts, reports and informal articles, alongside growing repositories and networks (such as Teach Access,[1] AccessU,[2] and the W3C's Web Accessibility Initiative[3]) typify the resources that discuss workplace teaching approaches and learning design. These can constitute an important knowledge-sharing resource in niche or emerging fields of research, and within the computer sciences, professionals will typically access these channels to share practice (Garousi et al., 2020; Kamei et al., 2021).

For web accessibility practitioners and specialists, reports suggest that formal schooling in digital accessibility is not the norm. For example, of the respondents to the WebAIM (2021) Survey of Web Accessibility Practitioners (total respondents 758), only 12.5% report formal schooling as instrumental in their preparation. 91.3% reported online resources (e.g., Stack Overflow, WebAIM, etc.) as the most predominant way of learning web accessibility, followed by 83.4% reporting on-the-job training or experiences and 81.1% reporting collaboration with peers or colleagues. These data show that the three favored ways of learning web accessibility are unstructured, informal, self-directed and largely individualized. While formal schooling is the least reported, there is an increase from 5.5% in 2018 (of 724 total respondents) to 12.5% in 2021 (WebAIM, 2018). Anecdotally, this increase may be indicative of growing attention to accessibility in formal education programmes, and (or) increased interest in accessibility amongst learners over time.[4]

Development of excellence in teaching and training requires content knowledge—what is known about a topic—and pedagogic knowledge—what is known about effective ways to teach—to be combined as "pedagogic content knowledge" (PCK; Shulman, 1986). PCK describes how teachers transform their knowledge of their subject in ways that make it available to learners (Shulman, 1986). What we can derive from research in digital accessibility education indicates that academic educators may have pedagogy-informed teaching practices but may lack digital accessibility content knowledge from engaging with accessibility in professional practice (see Shinohara et al., 2018). On the other hand, on the basis of consultations with, accessibility networks, stakeholders, and feedback from participants, we suggest that accessibility specialists tasked with providing workplace training may have content-informed teaching practices but may lack the pedagogic knowledge that comes from teacher training backgrounds.

To develop the combined "pedagogic content knowledge" that ensures content is delivered in the most effective way for a given set of learners in particular contexts, accessibility educators may depend on trial and error, reflexive practice, and pedagogic and content knowledge gained over years of experience, rather than being able to draw on relevant research, systematic insights into accessibility teaching and learning, or other signifiers of a

more developed and sustainable pedagogic culture (Lewthwaite and Sloan, 2016). This reflects educational studies that suggest teachers develop their pedagogic content knowing by critically reviewing, interpreting, tailoring, adapting and reconstructing content knowledge (Cochran et al., 1993), and where experience of teaching is seen as essential to the development of pedagogic content knowing (Morine-Dershimer and Kent, 1999).

In summary, we observe that:

- Accessibility is not universally included and covered in academic programs.
- The majority of graduates from academic programs are entering the workplace without awareness and understanding of accessibility.
- Available data suggests much accessibility learning happens in informal and workplace contexts.

The above themes indicate a significant shortfall in the teaching and learning of accessibility in academic programs. Expanding the frame of reference for accessibility education from individual academic contexts to cross-cutting research encourages broader dialogic practices through which accessibility education can be examined and debated more systematically and empirically. We are therefore motivated to examine workplace approaches to teaching accessibility and explore experienced educators" practice-based perspectives on establishing and sustaining digital accessibility capacity in the workplace. Greater knowledge of workplace practices can be interleaved with academic educational contexts to build pedagogical culture and develop greater understanding of how to teach accessibility to diverse learners in a range of contexts.

Methods

In this section, we discuss details of our research, including design, recruitment, data collection and analytic process. This research was approved by University of Southampton Faculty Ethics Committee.

Expert panel method

To consider approaches to accessibility education we used dialogue as our grounding methodological principle, using Expert Panel Method developed from Galliers and Huang (2012) and Lewthwaite and Nind (2016). Expert Panel Method comprises four phases, beginning with (i) individual interviews with expert educators, (ii) an early analysis and synthesis of interview data followed by, (iii) discussion forums of themes with expert educators as a group, and (iv) focus groups with groups of accessibility teachers and trainers, with each phase contributing to a cyclical and cumulative process of data collection, synthesis and analysis that moves from an individual to a community level. Our research questions include:

- What are the pedagogic approaches and strategies that characterize accessibility teaching?

- How does pedagogic content knowledge vary by discipline and professional context?

To this end, our research design has sought to co-produce new pedagogic knowledge in dialogue with teachers of digital accessibility.

Pedagogy is "hard to know" (Nind et al., 2016, p. 51). In education research, it is understood that much teacher knowledge is implicit and unreflected, developing over many years of practice. In emergent disciplines like accessibility, where there is a lack of pedagogical culture (Lewthwaite and Sloan, 2016; Putnam et al., 2016) it is important to develop a research design that makes pedagogic content knowledge (Shulman, 1986) available, and open to development.

Expert Panel Method involves a series of qualitative, semi-structured interviews with individual experts who are then invited to respond to an early analysis of the group's data, to share the developed themes and establish the salience of the research teams" account of the co-produced knowledge. To investigate approaches to accessibility education, we conducted interviews and forums for two panels, one focussed on approaches to teaching accessibility in higher education ($n = 14$), the second on approaches to teaching accessibility in the workplace ($n = 16$). Interviews were transcribed verbatim and shared with panelists for approval and checking.

Following our initial analysis of the interviews, we invited experts to engage and respond via a shared (online) forum over a 4–6-week period, foregrounding opportunities for dialogue around the data. We built the forum platform using basic WordPress features for optimal accessibility. We created posts for discussion topics and invited panelists to comment in threads on six major themes, to discuss their perspectives. We had 29 comment contributions from the academic discussion forum, and 28 contributions to the forum with workplace educators. All comments were extracted and added to our dataset to inform our findings.

These expert responses and interactions constituted a second wave of data collection (Lewthwaite and Nind, 2016), all comments were extracted and added to our dataset to inform our findings. Importantly, Expert Panel Method surfaces pedagogic knowledge by making it open to reflection, enabling shared discourse, collaborative problem-solving and debate (Nind and Lewthwaite, 2018). By moving from individual interviews to shared discussions, the surfaced pedagogies gained the communal dynamic necessary to substantiate themes of teaching culture and practice—factors also critical to the development of pedagogical culture.

Next, we tested the resonance of established themes, pedagogic challenges and issues with academic and workplace teaching communities through seven online focus groups with experienced teachers deeply immersed in teaching accessibility in different learning contexts and different content specialisms. We conducted three focus groups with academic educators ($n = 11$) and four focus groups with workplace educators ($n = 14$). Sessions were structured by interest area and time zone. To prompt group discussion and reflection, key themes from the expert panels were shared with the participants in advance. In discussion, some themes were endorsed, others were challenged, and further themes were proposed for consideration and discussion as the groups explored how different experiences mapped with those of the panel.

Analytic process

At the early-stage, analysis of the dataset was thematic, with data coded independently by three researchers and based on immersion in the data (working with transcripts, in view of video recordings). Following the initial analysis, sharing our take on the major themes and inviting participant discussion helped us to establish the credibility of our themes through participant validation (Bloor, 1983; Lincoln and Guba, 1985).

In the second, deeper wave of analysis, our research team inductively and iteratively pursued lines of inquiry critical to the study, our panels and focus groups. This influenced the development of broad-level themes (e.g., pedagogic approach, pedagogic challenges, teaching and learning strategies); themes within these emerged in a more grounded fashion (e.g., unprepared learners, level-setting, managing prior-learning) and were labeled using expert's own terminology (*in vivo*). We were not only interested in measuring recurrent themes, but in the importance the themes held for our panelists and responses to them in discussion.

Participants

We recruited expert educators from academic and workplace education programs, looking for panelists that we characterize as "pedagogic leaders" who "set the cultural tone" in their discipline and role (Lucas and Claxton, 2013) in the UK and internationally. As "expertise develops slowly and can be characterized by a large integrator knowledge base" (Shraw, 2006, p. 259), for our academic expert panelists, we recruited senior academics and accessibility specialists with significant experience over time of accessibility education, whose expertise was marked by peer recommendation, the publication of ground-breaking and influential books and papers with pedagogic functions, and activities promoting reflection on pedagogy for accessibility education. In the recruitment of workplace expert panelists, we sought representatives from a range of organizations with established accessibility education strategy, including government, large international corporations representing different facets of the tech sector, and accessibility NGOs, charities, and third sector organizations. We also interviewed accessibility educators from leading accessibility consultancies that work with a range of clients, inclusive of education, media, and industry groups. In this respect, data represent different educational contexts, from in-house training within a specific organizational culture, to training that is provided for external organizations, and bespoke. Significantly, many educators were involved in informal accessibility education alongside their work, for example, in Accessibility MeetUps, community conferences, hackathons, and other events, emphasizing the importance of these spaces as legitimate sources of knowledge sharing and expertise.

TABLE 1 Expert panel 1—Academic educators.

Name	Title	Institution	Country
Amy Ko	Professor	University of Washington	US
Andre Friere	Assistant Professor	Federal University of Lavras	Brazil
Annalu Waller	Professor	University of Dundee	UK
Cynthia Putnam	Associate Professor	DePaul University	US
Gerhard Weber	Professor	TU Dresden	Germany
Gill Whitney	Associate Professor	Middlesex University	UK
Gottfried Zimmermann	Professor	Stuttgart Media University	Germany
Helen Petrie	Emeritus Professor	University of York	UK
Justin Brown	Associate Professor	Edith Cowan University	Australia
Klaus Miesenberger	Professor	Johannes Kepler University Linz	Austria
Kristen Shinohara	Assistant Professor	Rochester Institute of Technology	US
Richard Eskins	Senior Lecturer	Manchester Metropolitan University	UK
Stephanie Ludi	Professor	University of North Texas	US
Tim Coughlan	Senior Lecturer	The Open University	UK

TABLE 2 Expert panel 2—Workplace educators.

Name	Title	Organization	Country
Anon.	Senior Digital Accessibility Consultant	Large enterprise organization	UK
Anon2.	Accessibility Program Manager	Google	US
Armony Altinier	Founder and President	Koena	France
Billy Gregory	Accessibility Project Manager	Ubisoft	Canada
Daniel Montalvo	Accessibility Education and Training Specialist	World Wide Web Consortium (W3C)	Spain
David Caldwell	Head of Accessibility and Digital Inclusion	Home Office	UK
Gareth Ford Williams	Director	Ab11y	UK
Jared Smith	Associate Director	WebAIM	US
Joe Chidzik	Principal Accessibility and Usability Consultant	AbilityNet	UK
Jonathan Hassell	CEO and Founder	Hassell Inclusion	UK
Makoto Ueki	Web Accessibility Consultant	Infoaxia	Japan
Paul Bohman	Director of Training	Deque	US
Scott Hollier	Chief Executive Officer	Center for Accessibility Australia	Australia
Sharron Rush	Executive Director	Knowbility	US
Shilpi Kapoor	Founder	BarrierBreak	India
Susanna Laurin	Chief Research and Innovation Officer	Funka	Sweden

The status and specialisms of many of the educators we interviewed means that retaining their anonymity before an accessibility specialist readership would not be feasible. As a result, with advance ethical approval and their explicit agreement, expert panelists are referred to in this paper by name, except where stated otherwise, as listed in Tables 1, 2.

For the focus groups, we also recruited in the UK and internationally, this time looking for educators from academic and workplace settings who are actively engaged in the delivery of teaching and training programmes. As such, this recruitment constituted a broader range of educators in terms of roles and experiences. We identified potential participants through a systematic literature review, professional networks, and searches of university websites and communities of practice. In this paper, focus group participants are quoted but are not referenced by name (Academics—AFG, Industry—IFG).

Findings

Our research study has sought to explore practice-based perspectives on accessibility education in a range of settings. In our data, our expert panels and focus group participants shared and reflected on diverse perspectives on teaching accessibility. In analysis, significant themes were developed around the pedagogical approaches, strategies, tactics, and tasks that educators use to develop accessibility awareness, understanding, skills, and competencies.

In the following findings, we report how educators reflect and act upon the pedagogic demands of teaching accessibility. We predominantly focus on approaches emerging from our workplace data, with additional insights from the academic data. The challenges of teaching digital accessibility fundamentals and the approaches and innovations adopted by educators to overcome these challenges cohere around three key issues: first, the rationale for the foundational approach; second, role-based strategies for teaching accessibility fundamentals; and third, perspectives on what constitutes accessibility fundamentals.

Rationale for the foundational approach

Establishing accessibility as a shared responsibility

Digital accessibility is increasingly recognized as a shared responsibility among everyone who influences digital programs and resources, from sharing content on social media to architecting and building enterprise systems. As participant Anon-I states: "...*everybody who touches anything that's digital needs to know something about accessibility.*"

Panelists acknowledged this shared responsibility and its attendant need for a "common baseline" awareness and understanding of digital accessibility, variously describing "*accessibility fundamentals*" (Anon-I, ArmA-I), the need for "*accessibility 101*" (ShrR-I; Anon2-I) "*basic requirements*" (DavC-I), "*foundations*" (DanM-I) and starting "*from the very beginning*" (DanM-I). Workplace educators in particular discussed the value of providing fundamentals training and courses to learners in different roles at the same time, as a way of level-setting with a common understanding of fundamental concepts.

> [We] offer accessibility fundamentals session to everyone involved in a project (managers, designer, developers, testers, etc.)... to make sure everyone [is] understanding they all have a role to play, e.g., encouraging developers to ask designers for specific accessibility requirements. (Anon-I)

However, responsibility for accessibility was found to be often delegated to the one person with sufficient digital accessibility knowledge and skills to teach the topic and perform accessibility tasks. Academic and workplace panelists described this scenario as "*the hero model*" (CynP-A), where someone champions accessibility, becomes the "*go-to person*" (ScoH-I), and effectively creates an "*accessibility island*" (ScoH-I) within their organization. The organization relies on that person to champion and sustain awareness of and attention to accessibility, whether as a course

topic, a product requirement, or an organizational priority. When they move on, attention to accessibility teaching and tasks drop off until the next champion or situation arises that reestablishes accessibility as a priority. "*I'm heading toward retirement and my biggest thing is making sure that people follow me on!*" (AnnW-A). Panelist Scott Hollier at the Center for Accessibility Australia describes this cycle of attrition, explaining the rationale for a workshop addressing exactly this issue:

> ...where an organization loses its one person that has some accessibility knowledge, then not only does that often end the [accessibility] journey, but the cycle is likely to repeat because there will be some other situation where accessibility is needed [...] someone will be picked to look at what that is... the cycle continues. (ScoH-I)

To reconcile the recognized need for shared responsibility with the practice of delegating responsibility, panelists described efforts to establish a common foundation of accessibility awareness and understanding, or "digital accessibility competency," across roles within their discipline and organization as a means to establishing and sustaining attention to digital accessibility in academia and the workplace.

Building accessibility awareness toward a common foundation

Workplace panelists discussed the need for digital accessibility competency within the organizations where they provide training, to have the necessary digital accessibility capacity to design and develop accessible products. They noted the challenge of developing expertise without foundational understanding and awareness of what David Caldwell at the UK Home Office described as "*the drivers for accessibility … why we need to do it, who it's impacting and those sorts of things.*" (DavC-I). Participants shared goals to establish what was often referred to as a "baseline" of accessibility fundamentals across roles to facilitate development of more specialized knowledge and skills. This required actively managing the "*different knowledge levels*" (IFG) that learners begin with:

> ...we want to get everybody to the same baseline and so that we can branch out from there in terms of their specific roles, in terms of the products that they work (on). … we want a good, solid starting point. (IFG)

Addressing misperceptions; harnessing and challenging prior learning

Learners who have prior knowledge of digital accessibility can present challenges to establishing a common foundation. In some cases, learners overestimate their preparedness and seek to skip directly to advanced topics. "*… it's often the case that they say, "No, no, no, we know the basics already so you can just jump into step two in your module." And then you ask them a couple of control questions and realize, no, [they have] no clue about this.*" (SusL-I). Addressing learners" misperceptions about their readiness may mean educators start off focusing on "unlearning" and "level setting." "*We are*

reaching people once they've learnt whatever they've learnt or they think they've learnt … and then asking them to unlearn." (ShiK-I). Panelists discussed the need for level-setting with learners, using strategies to establish what learners actually know early on, so even those who claim knowledge and expertise are prepared to start over and learn the basics to achieve common understanding. *"… the first thing I do is level-set. There might be some folks that think they're experts, and they've gone down the completely wrong path."* (BilG-I). *"Misunderstandings can arise just from people thinking they know what accessibility is, and actually at the end of the day, not knowing quite well."* (DanM-I). In some cases, learners have misconceptions about the nature of accessibility and may not see its relevance to their role and discipline. *"I think a lot of people when they look at accessibility, they think, oh, this is technical, this is coding."* (Anon-I).

Teaching strategies that address learning culture

A further challenge addressed by panelists related to self-directed learning cultures in the tech sector. Paul Bohman spoke of the "pedagogical standpoint" noting *"One of the big challenges is that developers…don't like to be trained. They love to learn though. They love self-learning"* (PauB-I). Bohman recognized this as "valid" and "an approach," but one that requires a strategic response to establish teaching expertise and hook interest. He described how he frequently begins with assistive technologies many learners have not previously encountered: *"it's a nice wake-up call right off the bat…because then they realize I might have something to teach them."* Contextual pressures also shape educational opportunities. David Caldwell and others spoke of the need to ensure training *"needs to feel…short, sharp and to the point"* and *"delivered in a relatively punchy short amount of time"* (DavC-I). Daniel Montalvo foregrounded considering broad teaching "scenarios" in the development of instruction *"you need to be flexible to accommodate those people and those other situations"* (DanM-I).

Accessibility in academic programmes

Workplace panelists noted that new employees are not prepared to meet their accessibility responsibilities related to their role in their academic programs. *"Our hope would be that the next generation of employees coming through require less of that training because they're getting more of it at school. And what we're finding is that it's still not true."* (IFG).

Academic panelists discussed the influence of curriculum requirements on ensuring some coverage of accessibility topics in academic programs. André Freire, professor at the Universidade Federal de Lavras (UFLA), noted the value of having accessibility among curricular requirements. *"Brazil is very strict in terms of the curriculum: what you have to cover in the course. So, accessibility is there."* (AndF-A). However, he also pointed out the limited time available: *"I have little time to go more specifically into accessibility issues."* Academic educators also discussed the limitations of mandating accessibility for learner engagement. Anonymous considered that if accessibility became mandatory in degrees *"we might have the familiar signs that the overall degree of motivation decreases really heavily."* (AFG).

Panelists shared perspectives on the difficulties they encounter engaging learners in accessibility topics in general. *"… there*

are some students who are not that keen on learning digital accessibility. They are learning it because it's part of a compulsory module." (AndF-A). In some cases, panelists explained the lack of learner engagement based on the perceived value and relevance of accessibility in general. Some learners regarded accessibility as extraneous, requiring extra time and effort for limited impact, and may not see digital accessibility as part of their current or future professional role and responsibilities. *"…sometimes there are students who… for whatever reason, are not at the place where they can accept this as something that they think is important for their career."* (KriS-A). Sometimes the beneficiaries of accessibility aren't perceived as compelling enough to justify the effort involved. *"…people tend to think that accessibility is something very, very special for a limited, small user group. And they tend to think that, if I'm gonna make it accessible then I must do something extra … I'm not going to do [that] for regular work."* (MakU-I).

Sustaining digital accessibility capacity

Panelists identified the need to maintain digital accessibility competency among both educators and practitioners to keep pace with changes in technologies and accessibility requirements, *"…accessibility evolves as technology evolves. So there's always new things to learn."* (IFG). Additionally, workplace panelists discussed the need for training at scale, where accessibility is integral to training programs aimed at maintaining digital accessibility competency, despite staff turnover. *"…we're trying to deliver training at scale … to do that in an ongoing way so that as a team grows and people come and go, they're constantly getting onboarded to accessibility."* (IFG).

> the other challenge is… How can this be delivered on an almost industrial scale? Given that you might upskill a developer and then you might mandate that they attend some in-person training. […] but then they may leave and then you've got another cohort to come in and train up.… it's a constantly moving target… retrain and retrain and retrain and retrain. (IFG)

Panelist Daniel Montalvo, lead editor of the W3C Web Accessibility Initiative's Curricula on Web Accessibility,[5] explained the importance of "refreshers" in both academic and workplace contexts, and the risks of not keeping current.

> … these refreshers sometimes are missing and lead to misunderstandings in later teachings. These are really needed to make sure that people really understand and are where we think they are. (DanM-I)

Supporting workplace culture and practices

Academic and workplace participants recognize a number of practical benefits of establishing a common foundation of awareness and understanding of digital accessibility. These benefits are secondary to those related specifically to building digital accessibility capacity but relate more broadly to professional

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5 https://www.w3.org/WAI/curricula/

practices aligned to organizational and disciplinary cultures and values.

- *Onboarding new employees*. Incorporating foundational training during onboarding was seen as important to ensuring new employees understand company values and policies related to digital accessibility and that they can actively engage with colleagues in enabling these practices. "*When new developers or designers join our team, they do have to at least take some introductory courses, so they understand what the rest of the team is working toward and just the overall message of the efforts that Ubisoft is making.*" (BilG-I).
- *Reducing technical debt.* In product development, "technical debt" comes from unaddressed defects and requirements that are allowed to accumulate but that will eventually need to be addressed. Accessibility defects and requirements are often deprioritized, becoming part of a product's technical debt. "*…it's important to get everyone up to speed as early as possible to avoid having to retrospectively fix issues.*" (Anon-I). A common foundation of digital accessibility competency supports a practice where addressing accessibility is a proactive activity rather than reactive one of fixing accessibility defects.

Making foundational training contextually relevant

Workplace educators—both those working within organizations and those working with external clients—stressed the need to make foundational training sessions relevant to learners" own organizational working practices and products. This was seen as crucial to engaging with and motivating the learners—an observation shared with academic educators who adopt real-world project briefs and client-based activities with their students to create authentic learning environments and scenarios.

> In the first sessions, I'll ask a lot of questions... we had a couple of ice-breaker exercises that we would do... like, "OK, you're going to be responsible for, say, a blind user or something else, and I want you to just think about the products you're working on and make a list of all of the barriers you can think about." (BilG-I)

Several industry-based participants acknowledged increased executive support (or "buy-in") for accessibility in their organizations but discussed the possibility of implementing mandatory training at a foundational level, noting that other topics such as ethics, security and privacy have mandated training for risk and compliance reasons.

> I do feel like the next step is saying, "Okay, there are certain things that you have to do." And that baseline knowledge... establishing that everybody is starting from the same knowledge base, is going to be that point where our executive team says: everybody has to go through this training… We do it with ethics. We do it with security and privacy… data analysis. There's no reason not to include accessibility on there. (IFG)

Role-based strategies for teaching accessibility fundamentals

Establishing a common language and understanding

Many different roles contribute to accessibility outcomes in the digital environment, including the procedural roles like project managers, design-focused roles like product owner, business analyst and UX/UI designer, implementation roles including software engineers and front-end developers, content roles like content editor and media producer, and evaluation roles like quality assurance and testing. To build capacity to deliver accessibility, panelists discussed the need to engage multiple roles:

> … fundamentally, what we've got to do to make accessibility have that step-change in terms of it being embedded, we need to make those skills common and acknowledged in many different roles. (Anon-I)

Panelists highlighted the need for different roles to be working toward the same outcome and noted that having different roles experiencing the same learning experience helped achieve that aim. "*I actually like... people in those different roles together in the same room. Because in the end, what they need to accomplish is the same thing, no matter where it starts.*" (JoeC-I). They acknowledged different learning paths for different roles but stressed the importance of a shared understanding of accessibility fundamentals across roles. "*The content provider will have a different path than the coder for example, but all will share the need for basic, shared understanding of intent.*" (ShaR-I).

Panelists also stressed the importance of setting up learners with fundamentals to support them in developing more specialized, role-based competencies. With a common baseline, learners can move together into more specialized topics with a shared understanding. "*Once the basics are shared and widely adopted and understood, specific role-based training can begin.*" (ShaR-I).

Also, different roles need to be able to communicate about accessibility within their domain and with people in other roles. Starting with a common baseline establishes a common language to support communication and collaboration with people from other disciplines and roles: "*day one, it's common for everybody, the manager, the developer the auditors … the fundamentals*" (ArmA-I). Jonathan Hassell of Hassell Inclusion describes the need for cross-role communication and understanding of roles and responsibilities to support collaboration.

> We need developers who can speak to other developers about why this is important. We need product managers to speak to other product managers, and we need all of those people to be able to understand each other's roles in digital production well enough so that they are then able to speak to any of the people. (JonH-I)

Cross-role training addresses several challenges, including ensuring everyone understands their role and responsibilities as well as others, so they know what they need to do, when they need to do it, and when and who to pass on to during a project. "*… we don't want just a developer working at a desk. If possible, we*

love to mix the roles and get QA, design and development all in the room at the same time, so they understand what their individual responsibilities are and how they overlap and how they can work together." (BilG-I).

Building on foundational knowledge—supporting specialist training

Panelists discussed the need to provide learners with specialist knowledge and skills in topic areas that are specific to their roles and interests. "… *once you're off the baseline, if you don't get into the specifics of somebody's job and somebody's experience, then you lose their attention very quickly."* (RacC-I) Several panelists noted that learners may not always want to start their learning journey at the beginning—*"It's basic. They don't care."* (ArmA-I)—and that educators may misjudge learner knowledge: *"… we think our audience knows what they're being taught about and what they know the rationale behind, and that might not be the case."* (DanM-I).

However, panelists saw foundational knowledge as a necessary prerequisite. *"… once we build that foundation of 101 knowledge and empathy, then we can get into, "OK, here's how it applies to you specifically and how you can put this into action in a real, tangible way".* (Anon2-I).

There was general agreement on the necessity of mastering fundamentals before moving forward toward more in-depth and targeted topics: *"… there's a starting point, which is like learning the basics, the principles, fundamentals, all that sort of stuff, and you can progress through there."* (IFG).

Billy Gregory of Ubisoft described specific role-based training as "inevitable," but added:

> … it's equally important that all of the roles understand what everybody else's job is as well. And there is a lot of overlap… it's a wave … a continued effort. It's important everybody knows what their role is and their responsibilities for accessibility within their role. But they also need to know where things have to get passed off. (BilG-I)

Making learning experiences relevant across roles

Most participants saw accessibility as a distributed, cross-role endeavor, requiring a shared understanding of its relevance across roles. Learners come to the topic from many different directions, with different roles and approaches, and differing areas of interest, responsibility and accountability. *"if it doesn't directly impact their role on a day-to-day basis, we want to get the awareness, but they will get to a certain level and their level of knowledge for their role will be sufficient."* (IFG). However, panelists reported difficulty making learning experiences relevant across roles *"… it becomes a problem if half of the room are designers and the others are web developers because they have completely different previous knowledge, and different needs. It becomes really hard. That's why the open training sometimes can be the hardest."* (SusL-I). Some panelists were adamant that beyond awareness raising, training had to be role-based:

> I don't want to waste anybody's time… when people go on an accessibility course and you've got designers sitting next to developers sitting next to people who do content sitting next to people who do procurement. None of those people should ever be in the room with each other learning about accessibility unless they are learning about why accessibility is important. (JonH-I)

Cultivating cross-role communication

Collaborating on accessibility can help team members work with or overcome differences inherent in different roles and disciplines, including communication and cultural differences. *"A lot of times the designers are so distanced from the coders that good communication doesn't happen. But if the designers are doing their job correctly, they would need to be able to speak the language of the developers enough to go back and forth."* (PauB-I). Accessibility provides a platform for team members to gain understanding of core responsibilities and supports effective communications across different roles. Jonathan Hassell explained that cross-role communication is at the heart of pedagogic reasoning behind "Accessibility Champions," which are organizational networks designed to specifically to bring together teams from across different roles:

> … because we don't just need developers who know how to do this. We need developers who can speak to other developers about why this is important. We need product managers to speak to other product managers, and we need all of those people to be able to understand each other's roles in digital production well enough so that they are then able to speak to any of the people. (JonH-I, emphasis added)

Armony Altinier from Koena echoed the call to involve managers, to enable a context where effective accessibility work can take place:

> [with] managers … we want them to understand what it [accessibility] is: you can't choose a magic tool to make it accessible, it's the way you conceive and design and develop. (ArmA-I)

Another expert discussed widening the roles in play explicitly beyond the design and development teams:

> … everybody who touches anything that's digital needs to know something about accessibility. And that also goes up to senior managers and stakeholders who have to prioritize work … As a business, it's not just a technical problem, it's a legal risk and business opportunity. (Anon-I)

Perspectives on what constitutes accessibility fundamentals

Many panelists from both academic and workplace sectors discussed the fundamental challenges of designing and structuring

their teaching and training in ways that effectively address the learning of core concepts and supports learner progression. "*How can you structure the field of accessibility to say, this is very much a beginner's approach and this is a next level, and an even higher level, and get some agreement among the few people who teach in this area …?*" (GerW-A).

Addressing the multifaceted nature of accessibility

While digital accessibility is inherently an applied and technical field, both academic and industry-based panelists described the challenges of engaging learners in the social, legal and professional aspects of accessibility that can help conceptually and theoretically frame their understanding of the topic. Such aspects include human and civil rights, models of disability, legal and organizational requirements and obligations, and professional accountability. "*… they're [learners] not particularly so interested in the legal side or the theories and things like that.*" (TimC-A). In particular, we found the more technical disciplines and roles tend to engage with accessibility through practical, task-based and procedural modes of learning, without necessarily considering the personal and human impact of their work. "*… it's that classic thing, they can build this complex stuff and never think about the user.*" (RicE-A). In response, several panelists discussed adopting human-centered design approaches and models:

> We need to teach them the disability side, the humanizing side of accessibility, the "why", and the understanding of what this technical requirement means in terms of assistive technology and access. (Anon-I)

Incorporating multiple facets into foundational learning

Incorporating these facets in foundational teaching and training provides learners with the opportunity to engage in these from the outset and establishes them as core baseline concepts. "*People get a little bit of the theory and the legal side alongside understanding technically what it means … You don't really get the whole picture unless you have a bit of all of those.*" (TimC-A). While this may, as outlined above, challenge preconceptions and prior learning, it helps establish a broader and more informed understanding of accessibility as a complex, multi-faceted field of study and practice.

> We'll do an introduction to accessibility to try and get people on a level playing field, give them the minimum knowledge. … We talk about: What are disabilities? Why should we be accessible? including the ethical and moral reasons, as well as the business case, which more people are interested in, and the breadth of disabilities and then the standards we refer to. (JoeC-I)

For educators in academia and the workplace, understanding disability and accessibility needs is core to the foundational approach, including first-person perspectives on disability and assistive technology to build empathy and understanding among learners. "*There is kind of the foundational learning, the 101 stuff, the things you have to know about: what is accessibility? and the basics. But we're also building that empathy in there because I think empathy is so important to the teaching of this subject.*" (Anon2-I). Additionally, addressing attitudes about disability is another core objective of the foundational approach. "*And so we spend a lot of time with the concepts and we make exercises to understand ableism.*" (ArmA-I).

Identifying baseline knowledge and skills

Such approaches present us with the challenge of what constitutes "baseline" digital accessibility competency. Panelists discussed the need to define the level of awareness and understanding needed to achieve the aims of the foundational approach. "*… the struggle point for me is figuring out what is actually included within that starting point. What is the baseline knowledge that we want every single employee to have…?*" (IFG). They acknowledged the difficulty of covering fundamentals for a field as complex as digital accessibility in a way that will have a lasting impact on learners.

> fundamentally one of the challenges of accessibility is… What are the basics that everybody needs to know?… we can't teach everything, because it's really complicated and there's so much. The challenge is identifying the core curriculum that will have the biggest impact. (Anon-I)

Some panelists discussed the challenge of providing accessibility fundamentals in sufficient detail to engage learners enough that they will moving forward. "*I always had this question to myself, how can I give the students enough so that they study this in more detail if they are interested in it?*" (GerW-A). Further, given that the contextual aspects of accessibility—in terms of the disciplinary, role-based and organizational cultures outlined above—clearly influence how the topic is taught and learnt, how flexible does a core curriculum need to be for it to be effective for all learners? "*… having a very large development team working on many platforms, based in different countries, getting them to have some basic knowledge is very challenging.*" (Anon-I).

Defining a core curriculum

Given these challenges, some panelists described the need for defining a common curriculum for accessibility fundamentals. "*Even though there's different ways of teaching, there needs to be some shared knowledge and shared ground understanding of accessibility. And that, would apply for everybody involved in accessibility, irrespective of their role.*" (DanM-I). Several highlighted a general lack of guidance and resources in the field that they may draw on. "*…there isn't any research or any public information about what "this" is—the really good core curriculum.*" (Anon-I).

Some panelists discussed introductory or "101" courses in the context of larger curricula designs and structures, in which they provided a foundation for learner progression and specialist training. Daniel Montalvo outlined the role of the Foundation Modules of the WAI Curricula on Web Accessibility as a starting point before moving onto role-based modules, noting "*…I*

would support the idea that courses would start from the very beginning [with foundation modules]." (DanM-I). Others discussed the challenges of designing a core curriculum around existing organizational training structures and in formats that are easy for learners to consume:

> we have [a] foundational education that is relevant to everyone. … instead of having someone teaching the same course over and over and over again to everyone who is interested in accessibility, we have self-driven learning modules … broken up into more digestible pieces. … from there, the courses starts to be more tailored to that role. (Anon2-I)

In the online discussion forum, panelist Sharron Rush shared Knowbility's "Accessibility 101" topics, which is a mandatory module in their client training, and "should be in most academic courses":

> Who is this for: disability statistics and how people with disabilities use digital technologies. Personas or live demos needed to begin to understand accessibility barriers and how to avoid them.
> Why do we do it? The business case that includes legal, civil rights, market data, and ties to innovation through accessible design.
> Authority – the W3C/WAI and the global network of laws that are based on those standards. Introduction to web accessibility standards and guidelines but not detailed exploration.
> The need for organizational leadership and buy-in throughout the culture. Describe a planning, implementation, and managing process. (ShaR-I)

And yet establishing a common, agreed curricula requires sensitivity, not just to role, but also national context. Discussing fundamental accessibility topics, Armony Altinier identified important content for her French context, gesturing to how the geopolitics of disability is bound into accessibility practice, leading to particular emphasis in training delivery:

> It's really about the people, the needs, the social model of disability. Because we have so many problems in France: It's really a medical approach [here]. And it impacts on the way you're auditing or you're applying accessibility if you don't have a good approach. (ArmA-I)

Embedding foundations across disciplines

As one of our workplace focus group participants observed, establishing foundational awareness and understanding of accessibility is applicable to curricula and training programmes across both academic and industry sectors, and pertinent to continued professional development in the field:

> It's not necessarily included in the coding courses, it's not included in design courses. And while where we're seeing an investment in continuing education when it comes to accessibility and having this add-on after you have gone into a

profession, we're still not seeing it at that basic intro level, which is where I think it really needs to be in order for programmes to develop more extensively. (IFG)

With this in mind, we consider the implications of these findings not only from the perspective of workplace training, but also in context with the academic sector, to discuss the most effective approaches to establishing and sustaining foundational learning in accessibility.

Discussion

Across our interviews and focus groups with expert educators in the workplace, a concern with accessibility foundations has been clearly articulated. In analysis, we find that this foundational approach is not only about content but is a pedagogically informed teaching approach—a way of doing accessibility education—that is invested with the significant pedagogic content knowing that experienced teachers accrue in practice over time. In this discussion, we draw on the findings above to reflect on this foundational approach.

In promoting a shared understanding and pedagogical culture around the teaching and learning of digital accessibility, it is important to critically reflect on the use of language and identify key terminology. Throughout this study, we have found the terms "foundational," "fundamental," and "baseline" used interchangeably and largely uncritically by participants, though we acknowledge these may be referencing specific teaching approaches or organizational training practices or programmes. Looking at these terms from an educational perspective, we might associate "baseline" with a minimal threshold, or an accreditation, indicative of a practice heavily associated with compliance, while "foundational" reinforces a discourse of opportunities or expectations that learners will progress on their learning journey onto more advanced or specialized levels. And while one of key purposes of foundational teaching may be to establish a shared or common awareness and understanding of accessibility, there may be variations in the cohort of learners and the roles and responsibilities they represent. Given the contextual factors associated with specific organizational cultures and workplace practices, there is an inherent tension in attempts to establish a common baseline or foundational model, programme or curriculum, in which agreed sets of knowledge, skills or competencies in digital accessibility are defined. Further, such approaches can become heavily manifest in the normative pedagogical structures associated with "best practices" which can decontextualise the sociocultural aspects of learning and the complexity and "messiness" of teaching (Lefstein and Snell, 2013). However, our findings show that educators from both workplace and academic sectors have developed common approaches and strategies to effectively engaging learners and professionals with accessibility fundamentals suited to a range of contexts.

The findings indicate that approaches to workplace training at this foundational or baseline level is more than simply introducing the topic to learners but is a pedagogically invested practice that is manifest in both industry training cultures and professional development. For many workplace educators, this involves

establishing a shared understanding of accessibility that includes and extends beyond raising awareness, and constitutes a resetting of values, beliefs and perspectives that underpin a core level of knowledge, skills and competences. We have seen that this process typically involves (i) addressing disparities in learners' experience and expertise that are inherent in computer science disciplines and professional roles, and evident in prior learning (including students graduating from higher education); (ii) challenging learners' preconceptions or misconceptions gained through prior learning, experiences or lack of; and (iii) reinforcing local contexts i.e., making training relevant to specific organizational cultures and work practices.

We find that accessibility workplace educators have distinct and well-developed pedagogic content knowledge gained on the basis of years of experience rather than developed through available pedagogical culture or reference to teacher training or learning theories. In light of this, we note that many of our workplace expert educators did not use the language of learning theory or education as a discipline—a factor that several reflected upon during interviews. Instead, the discourse—the talk— of accessibility became pedagogically loaded and expressed in ways that value effective practices that constitute capacity building at an organizational level. In this way, "101," "fundamentals" and "basics" differ from learning outcomes *per-se*, to instead express ways of doing—and knowing—that are essential in establishing the groundwork for teaching core concepts across a range of professional roles and domains.

While we see excellent examples of accessibility teaching in higher education, messages from industry indicate that the majority of university and college students are graduating without the necessary awareness, understanding, knowledge and skills in the topic, even at a basic, foundational level. In the academic sector, the embedding of accessibility is contingent on the structural contexts of curricula design, varying considerably between institutions and courses. Typically, this is shaped by the perceived relevance of accessibility within the various sub-disciplines of the computer sciences, despite studies emphasizing accessibility can be embedded in non-HCI curricula without disrupting core learning objectives (Jia et al., 2021; Bhatia et al., 2023). As such, for some students, their exposure to accessibility may only be provided within elective or optional modules, perpetuating its reputation as a specialist rather than core topic within technology-related fields. Therefore, while some graduates may have had the motivation and opportunities to explore accessibility as a specialist topic before entering the workplace, and may end up instrumental in advocating or even leading its development, for many, a fundamental awareness and understanding would be seen as advantageous, even if subsequent industry baseline training and onboarding requires a certain amount of "resetting" to accommodate specific workplace contexts and practices.

While we can question whether the primary purpose of higher education is to provide for the job market (Brooks et al., 2021), studies suggest most computer science students undertake degrees primarily to prepare for the workplace (Raj et al., 2022). Dialogue and collaboration between academic and industry sectors should be encouraged. Greater understanding and indeed, adoption of work-based learning pedagogies in higher education requires a flexible approach that recognizes the complex interplay of discipline-,

learner-, and employer-centered contexts (Nottingham, 2016). Some of the academic panelists indicated that linking accessibility competency with employability can be an effective motivating factor for students to engage with the topic. While studies report "a growing need" for graduates with skills in accessibility (Sonka et al., 2021), there has been little research into how this is specified in workplace recruitment (Martin et al., 2022). Our findings confirm there is a tendency to value practical and authentic learning approaches that help equip students with the necessary applied knowledge and skills when they graduate. However, we should also acknowledge the particularly effective role that higher education can play in developing the "soft skills" that enable learners to engage with the multiple and complex aspects of accessibility in a critical and reflective way, such as skills in communication, leadership, and collaboration. In establishing baseline competences, these skills encourage engagement in the conceptual, social and affective aspects of accessibility, rather than an approach overly focused on technical skills and knowledge.

Wherever accessibility is first introduced, we tend to see teaching approaches that place considerable focus on engaging learners with the topic, with the aim of providing a basic awareness and understanding, while sparking enough interest and motivation for those who might wish to pursue accessibility further (possibly through optional modules or specialist training). The challenge of engaging learners by making accessibility interesting and relevant, while ensuring sufficient coverage of the key aspects of the topic was a concern equally shared by academic and workplace educators.

Conclusion

Our findings show the value that experienced workplace educators place upon establishing a common foundation in accessibility awareness and understanding. The emphasis placed on communication competencies, and positioning of accessibility as cross-role at a fundamental level, accords with previous work that has established digital accessibility education to be understood as a shared endeavor, between academic and workplace sectors (Coverdale et al., 2022). Crucially, for most professionals, the transition represented by graduation into the workplace typically coincides with expectations of a foundational engagement with accessibility. It would therefore seem appropriate for both academic and industry sectors to share responsibility in enabling the most effective approaches toward establishing a common baseline. We have seen how each sector can offer distinctive perspectives and expertise, and through greater dialogue and collaboration they can provide opportunities for knowledge sharing and pedagogical understanding. This would help create a more cohesive, joined-up approach to how accessibility is embedded in teaching and training programmes at a foundational level, while identifying the best learning pathways for different disciplines, roles and specialisms in more advanced engagement with the subject.

Importantly, digital accessibility roles extend far beyond the tech industry and software engineers. While developers, designers, content authors and IT staff all play a role in the creation and operation of digital technologies, in an era of social media and networked publics, we are all digital designers, makers and authors. When any user contributes to a website, posts a video or

conducts an online meeting, they can create or remove barriers to participation. Given that responsibility for digital accessibility and effective communication is distributed, it is essential that we establish a common awareness and understanding of digital accessibility and sustain that foundation as technology evolves. Developing and sharing insights from accessibility educators in the workplace and across a range of contexts, offers a rich way to develop a more substantial teaching and training repertoire that helps everyone who talks about accessibility become a more effective educator.

Going forward, our research shifts focus from "pedagogy as specified", to "pedagogy as enacted" and "pedagogy as experienced" (Nind et al., 2016), as we undertake case study research at innovative and leading sites of learning in the workplace and higher education. This future work seeks to further investigate and understand foundational approaches to digital accessibility education, alongside other dimensions accessibility teaching and learning. This research will inform a typological framework of accessibility pedagogy that maps the relationships between teaching approaches and learning tasks for educators to use to develop their practice. From this evidence base, we seek to support educators looking to enhance their teaching, by testing and evaluating applications of our work for teaching development through Impact Residencies and participatory action research with partnering organizations. These efforts to move research into continuing dialogue with practitioner expertise will be instrumental in helping us develop further pedagogical understanding of the foundational approach to digital accessibility education highlighted in this paper.

At the same time, we recognize that further work is needed at many levels to fully engage, understand and develop accessibility education as a field and it is supporting pedagogical culture, broaching different contexts and capitalizing on the substantial literatures of work-based learning, lifelong learning and informal learning, recognizing that the pedagogical content knowledge of accessibility remains largely under-explored in these contexts.

Data availability statement

The datasets presented in this article are not readily available because this study is ongoing. Where participants agree, qualitative data from this study will be deposited with the UK Data Archive in 2025. Requests to access the datasets should be directed to s.e.lewthwaite@soton.ac.uk.

Ethics statement

The studies involving humans were approved by the University of Southampton Faculty Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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