Triggering Universal Design in HE Digitalization

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Summary: *Some digital developments produce "universally designed" solutions, allowing utilization by a wide range of users in a wide range of situations. Norwegian Higher Education (HE) institutions are becoming increasingly digitalized, but universal design (UD) has so far not received priority, and disabled students still face excluding mainstream solutions. New legislation seeks to rectify this by placing stronger accessibility responsibilities on ICT used by the educational sector. But is this updated law sufficient to trigger UD focus in Norwegian HE digitalization efforts? This paper hypothesizes an answer, by drawing on insights from HE case studies and Fogg's theory of persuasive design. We propose factor relationships needed to successfully ensure UD in HE digitalization.*

1. Introduction

The Norwegian Discrimination and Accessibility Act (DTL) of June 2008 emphasized UD as a human rights issue [1]. It went into force 1.1.2009, and specifies the duty to ensure public physical and digital environments are usable by all. Ensuring UD of ICT became increasingly pressing as our society underwent digital transformations. In 2013 the regulations for UD of ICT were written [2], taking effect July 1st 2014. Focus is on ensuring technical accessibility and compatibility with assistive technologies that disabled user groups need. The Act relating to Universities and University Colleges of 2005 states learning environments should be based on the principle of UD [3], but sector legislation explicitly covering UD in digitalized educational environments was never updated as expected.

The effect of higher education (HE) is significant, with likelihood for employment increasing 4,5 times with a HE diploma for disabled professionals [4]. The HE sector is increasingly digitalized, both for pedagogical purposes and as part of institutional service digitalization. In these efforts, our impression is UD perspectives are lacking – at best only partly considered or regarded as less important than aspects such as cost or functionality. Several studies report accessibility issues in current LMSs. Our case study into institutions converting to digital assessments revealed a lacking attention to safeguard UD [5]. The consequences of not being able to use a LMS or take an digital HE exam easily and effectively is of great consequence to students with disabilities – who are already at a disadvantage. Politicians proposed in October 2015 to explicitly include the educational sector in DTL. This was agreed on in September 2017 [6]. The updated legislation appears intended to ensure the digitalization of HE will take UD into account – including improving the UD requirement specification in digital procurements. As of 1.1.2018, digital teaching aids (eLearning systems and tools, learning materials and digitalized services) must follow the UD of ICT regulations. The aim is for eLearning tools and digitalized HE services to be used by as many students (and staff) as possible - without the need for adaptations - in a wide range of situations and across different devices and platforms. As a legal minimum they must adhere to the WCAG AA-level and be able to be used in combination with assistive technologies. However, drawing on our impressions from the case-based knowledge, do we believe the legislation sufficient to reach its intended effect?

2. Methodological Approach

According to Fogg [7], human behavior (B) can be triggered (T) if adequate motivations (M) and abilities (A) are present. According to Fogg's theory, a trigger factor is only successful if there is a sufficient combination of motivations and abilities. High motivation can overcome constraints, and high abilities can overcame low motivation. In other words, the formula of "B=MAT" can be applied to model a simplified and static overview on the relationship of factors influencing human behavior. Based on insights into empirical data, we see several challenges related to UD in HE. These factors are summarized, categorized as *abilitators*, *motivators* and *triggers*, and mapped into the model.

3. Impressions

From the case study on digital assessment procurement, we interviewed 21 informants; two solution providers and 19 from HE administrations [5]. We detected several challenges, which seems fairly consistent with other research findings. Our impression is negative mechanisms may be in place on the following factors: Lacking UD Awareness, Knowledge of Technical Possibilities, Knowledge of Legal Responsibilities, UD Capacity Building, End-User Participation, UD Quality Assurance, Real User Testing, Discussion of Digital Transformation and Value Effect, Underutilized Technical Accessibility Competence and Contextual Usability Competence, Weak UD Responsibility Assignment and UD Requirements, Staff and Change Fatigue. On the positive side, budget constraints are not emphasized. Our assumption is that clarified requirements, legal responsibilities and bottom-up UD enthusiasm are triggers. This is consistent with data gathered from UD success cases from ICT-industry [8]. A starting point for understanding the dynamics of what is (not) working in our sample is proposed in Figure 1.
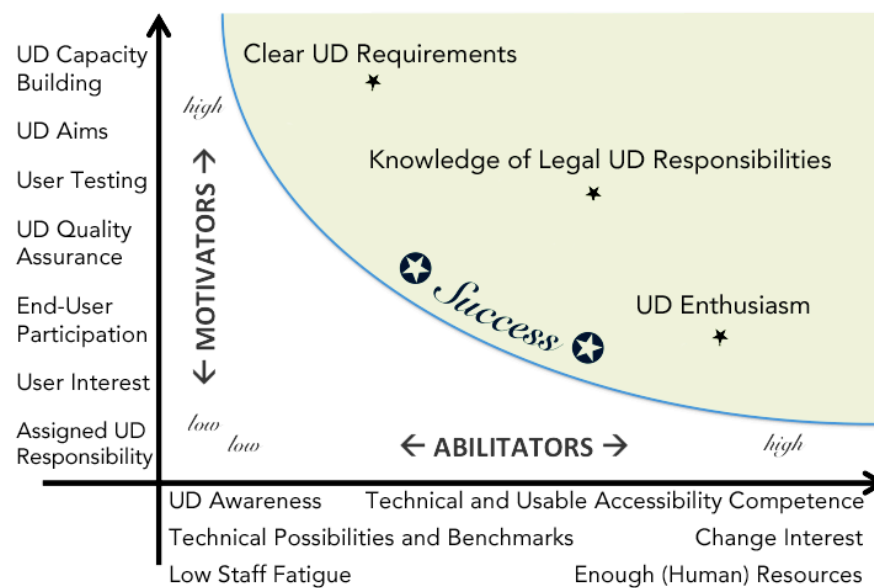

Table 1: Mapping identified challenges into Fogg's B=MAT model.

4. Discussion

Our data shows heterogenous solutions are selected among HE institutions. As each HE institutions select and pay for their solutions, combined efforts such as that of UNINETT seems important to support procurement processes. However, UNINETT proposed UD requirements are not considered satisfying. For example, in 2016, UNINETT proposed mandatory requirements for UD in procurement of digital assessment solutions as the following: "documentation must be submitted in both Norwegian and English", "the user interface must be available in English and Norwegian Bokmål" and "should be available in Norwegian Nynorsk" [9]. Though providers are asked to further describe strategies for usability aspects, only half of these relate to accessibility and no accessibility requirements are set. In later UNINETT recommendations on LMSs, detailed reasonings and ratings (such as accessibility assessments, providers' replies and final priorities) are not open to the public. In order to ensure UD, each institution must thus rely on in-house organized UD quality assessments. An improvement would be to increase the open sharing of any assessments made by one HE institutions to others.

Though the institutions overall hold competence in UD, it is spread throughout the organization and not necessarily linked to digitalization processes. For example, staff working with institutional websites have followed the UD of ICT regulations since 2014, and should have in-depth knowledge of technical accessibility. Further, staff working with individual adaptation to individual students have experience with UD in real-life contexts. Design, ICT and Health departments have students and staff with relevant knowledge. We have no examples of how these resources are utilized. Some fatigue is indicated among staff. Though legal demands are clarified in the updated law, there has been little work done yet to "spread the word" and inform the HE sector of their institutional responsibilities

related to UD. We hope that the law clearly defines minimum criteria for technical accessibility, and propose improved versions of UD requirements specification [9]. However, usable accessibility must still be specified related to the context and aim of the digitalization.

Connected to the lack of necessary hands-on UD competence is lack of student and staff participation, user testing and in-context quality control. There is little or no user involvement and no real-life testing with disabled students prior to delivery. For example, we learned individual exam adaptation is costly and strenuous for the student as well as HE staff. Still, the new mainstream digital assessment solutions are not suitable to solve these issues. Instead, they pose new issues by demanding the use of systems with low accessibility and e.g. by replicating closed-book exams on campus computers and thus hindering access to assistive technology needed by disabled students. Further, the pedagogical value or cost-effectiveness of the new solutions in practice seems neither planned nor quality assured. It does not seem pedagogical strategies are discussed –in the case of digital assessment improving facilitation of more advanced open-book exams, such as simulations, formative feedback sessions, portfolio assessment and collaborative grading. Overall, it can be argued that real-life utilization receives too little attention, with focus on *digitization* rather than exploring opportunities for *digital transformation*. Instead of exploring digital transformation values, focus seems to be on digitizing existing solutions through top-down adminstrative efforts. End-results seem to end up as feature-dense in order to cover any possible usage situations and needs, without a clear increase in real-life utility for students and staff, and without the necessary level of usable and accessible main solutions.

5. Conclusion
Through our own and other researcher's exploration, an impression has been formed as to the reasons for why UD up until now has received insufficient attention, priority or quality assurance. The intitutions lack knowledge of the UD qualities in external solutions, legal demands and their practical implications and technological possibilities and reasonable accesibility requirements to ask of digital providers. Further, appropriate user participation and in-practice quality assurance is lacking. Figure 1 visualize triggers, motivators and abilitators necessary to either fail or succeed with triggering UD, based on our insights. Drawing on more HE cases and experiences, the proposed model can be updated to better reflect factors and mechanisms needed. The model could also be expanded to better ensure e.g. user participation, social cost-reduction and transformational value.

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