Disabled Student Voice on Online Video Lectures: A Small Step towards Blended Learning Approaches in an Inclusive Curriculum Design

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Abstract—**This paper reports on an ongoing research project at Birmingham City University (BCU), where students with disability are being consulted in order to inform the design and the implementation of an inclusive curriculum design through blended learning approaches. One focus group was conducted with BCU students with disability. Participants were asked to provide opinions on previous experiences with teacher-generated video lectures, the flipped classroom paradigm, video presentation formats and web interface features for online video dissemination. Although the data collected is limited to a very small sample, participants provided valuable feedback, which is informing and redefining inclusive design strategies, with the needs of students with disabilities at their core. The flipped classroom approach was perceived as a welcomed innovation, which could compensate the lack of classroom accessibility (i.e.: difficulty of note taking). An unexpected finding was the perception of teacher-generated video presentations being somehow associated with "less effort" on the teacher's side, and a lower production value when compared with a professionally filmed video presentation. Also, based on past experiences, students were generally sceptical of the ability and will of their teachers to engage in the process of creating video lectures, highlighting the necessity of teaching staff training and support.**

Index Terms—**video lectures, blended learning, flipped classroom, disability, accessibility, usability, E-learning**

I. INTRODUCTION

Blended approaches are generally considered to be more effective in terms of student performance and retention, especially if they consist of "true blend" of online and face-to-face activities. This formula allows students to engage with active learning, and the nature of the engagement is a critical factor for learning [1], [2]. The flipped classroom approach has been identified as one of the curriculum design tools to achieve these goals. Video lectures, or more often video presentations, are disseminated to students through a virtual learning environment, to be viewed out of class, at the student pace (generally before a face-to-face session), and the classroom time is dedicated to knowledge application,

social learning [3] and allows tutors to detect errors in thinking [4].

The Birmingham City University (BCU) Strategic Plan includes aims that highlight the importance of the "use of technology to deliver innovative and effective approaches to learning and teaching" together with "high quality learning environments in terms of physical spaces, learning resources supported by appropriate state of the art equipment" [5].
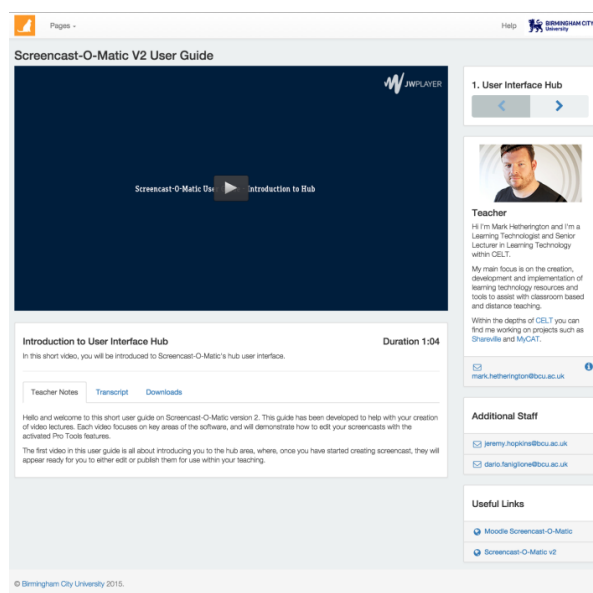

Figure 1. The video lecture web template created by CELT.

Blended Learning approaches have been identified to be appropriate and effective to facilitate the implementations of these aims, based on findings by other Higher Education institutions and research studies [6], [7]. In February 2015, the Centre for Enhancement of Learning and Teaching (CELT) at BCU commenced a training and consultancy pilot project aimed at raising awareness of blended learning strategies with University teaching staff, in one BCU Faculty. All lecturers were asked by their line managers to attend a training session designed to empower them to create video presentations, which they would then disseminate via Moodle (the BCU

virtual learning environment) and an ad-hoc video lecture web template (Fig. 1) created by CELT. These training sessions are also meant as a way to begin a discussion around flipped classroom approaches as a curriculum design option, while contributing towards their personal development.

The implementation of these approaches on an institutional scale could raise accessibility concerns, especially in light of the Equality Act 2010. Hence, the facilitation of inclusive practices [8] implies a careful methodology of dissemination of best practices and appropriate training for teaching staff, who will be ultimately responsible for generating video content.

The research project described in this paper explores and captures opinions, perceptions and suggestions of students with disability, in relation to the flipped classroom paradigm, video presentation formats and web interface features for their online dissemination. This is also a first attempt to incorporate student voice into the design and implementation of blended learning approaches, and it is meant as a component of a wider research project on other aspects and tools of blended learning at BCU.

II. RELATED WORK

Due to the evolving nature of the learning technology field of study, common definitions and terminology are yet to be agreed upon [9]. In order to identify previous related studies and contextualize this work within the current research, Moore *et al.* [10] study has helped to inform the taxonomy for comparison for a review of related work.

Given the "uncertainty as to what exactly are the characteristics" of the terms [10], we focus on those studies related to students with disabilities, and videos, multimedia and web interfaces, in the context of online learning and e-learning (whether in conjunction with classroom activities or as a standalone distance learning experience).

Seale [11] provides a good overview of current accessibility issues and challenges for e-learning in higher education. Opportunities highlighted by this work include a renewed approach to "inclusive or universal curriculum design that avoids to provide alternatives" to online materials and activities. This would imply "thinking about the needs of students with disabilities at the beginning of the design process" [11].

One of the main UK focused studies, looking at general implications and issues of online learning resources and disability, was conducted in 2010 by JISC TechDis, a "leading UK advisory service on technology and inclusion" specializing in "supporting organisations within the education sectors" [12] and part of JISC (formerly the Joint Information Systems Committee).

JISC TechDis published a report, titled "Improve 3 Rs", which was meant to provide guidance for education providers in complying with the Disability Act 2010. One of its findings was that "where tutors put lecture/class notes online, the need for note-takers for disabled students is reduced" [8]. TechDis had also provided

guidelines on the delivery of specific multimedia formats and assets (images, graphs, video, audio, etc.), in order to simplify the general web accessibility guidelines provided by the Web Accessibility Initiative (WAI) [11].

One of the obvious aspect of accessible (online) videos relate to captioning and transcription solutions. Seal [11] shows how captions may benefit the Deaf and Hard of Hearing (DHH) as well as allowing a wider audience to access online video and audio (i.e. viewers with learning/cognitive impairment, not native speakers of the language of the media being streamed).

Caption rates and their consistency have been the focus of research on higher education caption-reading process (and TV caption). These studies have highlighted the differences between the cognitive process of reading print and that of reading a real-time caption (a representation of speech), which changes constantly in time while being displayed in the same visual space. The printed text is displayed as a whole entity and the reader is in control of the pace [13], [8]. Captions and subtitles are synced to the video timeline: although the speaking pace is a natural and important component [14] for listeners, it forces readers to a preset pace, which could be of unwanted speed at times [15]. In terms of accuracy, Jordan *et al.* [16] have shown how caption readers are particularly annoyed by keyword omission.

Villena *et al.* [17] have recently conducted experiments to assess the accessibility of web player controls, which are a key element of online media fruition. Their study has remarked that if web elements design is pre-planned focusing on accessibility issues, it also promotes better usability.

Although classroom accessibility is not the focus of this work, it is useful to consider how accessibility tools and solutions analyzed by studies in this area can be compared to their online counterparts. Marschark *et al.* [18] highlighted that "deaf students still do not have full and equal access in the classroom, even with visual translation services". Research in classroom accessibility solutions has amply investigated captioning options for DHH students. Kheir and Way [14] have compared two possible options of live captioning: human-powered versus Automatic Sync Technologies (AST). While the former is "expensive, not available on demand, and their captions may not match their consumers' reading speed and abilities" [14], the latter is less expensive and generally available, but it "produces unacceptable error rates, not only in most lecture environments, but also in many unconstrained real-world environments" [14].

III. METHODOLOGY

One focus group was conducted with BCU students with disability. The location of the focus group was a University classroom, on the ground floor. In order to recruit participants, three weeks prior to the focus group date, an email was sent to the mailing list of students with disabilities who have registered with the BCU Disability Services (circa 1,200 students).

Six students had registered their interest in participating to the research, but only five participants

were present in the focus group. Two of the participants knew each other already, as they attended modules together. A learning technologist facilitated the group.
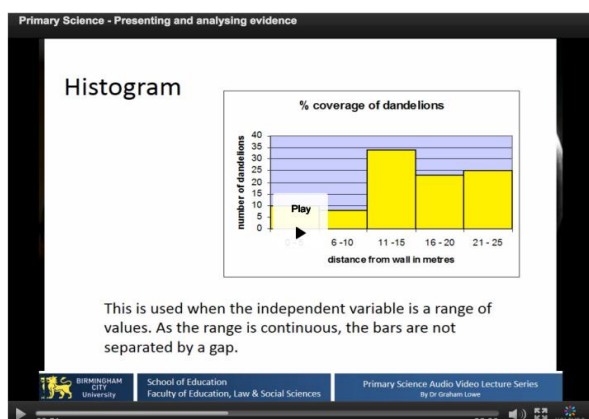

Figure 2.   Teacher-generated video presentation, with no webcam.
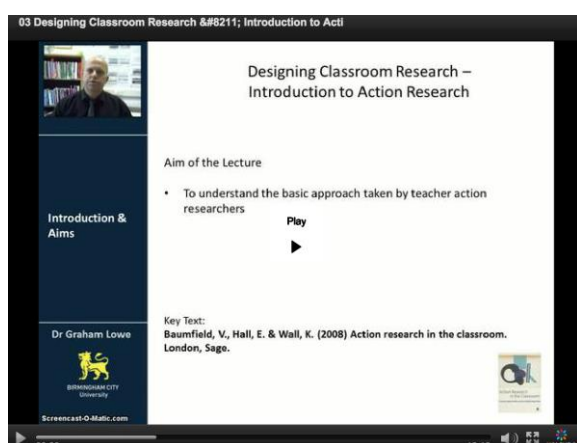

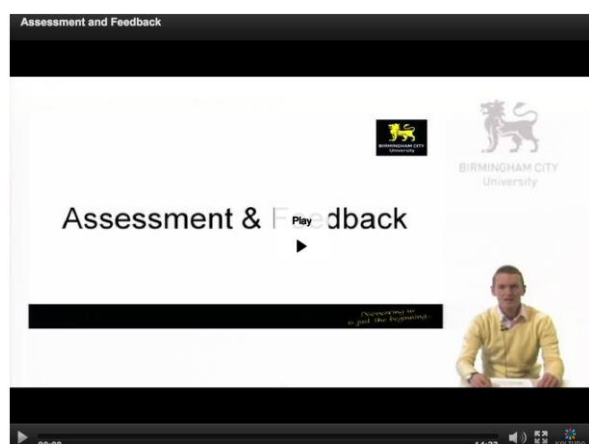Figure 3.   Teacher-generated video presentation, with webcam.

Figure 4.   Screenshot of professionally produced video presentation

A focus group discussion guide was used when facilitating the focus groups. The focus group consisted of different components:

1) An initial plenary discussion to share previous experiences in using of video lectures.
2) A follow up plenary discussion on desired ways of using video lectures within the University course of study. The aim of this component was to gather individual thoughts rather than group thoughts;

this then allowed the facilitator to discuss personal viewpoints as a group.
3) The CELT plan of staff-generated video lectures and the flipped classroom paradigm were briefly explained.
4) A follow up discussion aimed at recording impressions on the approach.
5) The video lecture web template (Fig. 1) was showcased.
6) A follow up discussion aimed at recording impressions on the template features and collect suggestions for possible improvements.
7) Three examples of video presentation formats (Fig. 2, Fig. 3, Fig. 4) were showcased.
8) A follow up discussion aimed at recording impressions on the above example.

The focus group was recorded using a dictaphone, then transcribed, and analysed through thematic analysis which generated key themes and insights. All participants were assured that whatever they said in the group sessions would not be attributed to individuals.

As a "thank you" for taking part in the focus group, participants were given a free lunch box to take away after the session. The lunchbox was composed by a sandwich, a juice and a small pack of crisps.

IV.   FINDINGS

A.   *Previous Experiences with Video Lectures*

Only one of the five students experienced some sort of video lecture usage within their course, although the lecture had not been produced by the teacher himself, but rather found on YouTube. The student was not satisfied on how the video resource was embedded and used in the module design. The video had been shown to students during a face-to-face session in class, and not published on Moodle to be watched by students in their independent study time. The student also lamented the fact that the lecturer commented on the poor quality of the video shown, as if he had not previously watched the resource and vetted it for classroom usage.

When asked if, before enrolling at University, they expected more use of video lectures (and learning technologies in general), participants generally agree that there was an expectation of a better usage of technology within the classroom environment (i.e. making sure equipment worked properly when needed in class).

Three participants experienced a lack of preparation and inadequate use of technology for classroom activities. Two students wished for more clarity in the editorial organization of Moodle courses. In particular, a student with dyslexia was expecting more online interactive resources to use in between classroom sessions, "rather than readings before class", as she needed a longer time than average "to make sense of a long text".

B.   *Expectation for Staff Generated Video Lectures and Flipped Classroom*

Based on past experiences, students were generally sceptical of the ability and will of their lecturers to engage in the process of creating video lectures:

"It will be a big step for them to be recorded".
"Some of lecturers don't like being recorded with dictaphones… I can't imagine them recording themselves on video".

The accessibility of videos was a unanimous concern, and the need for captioning and/or transcripts was identified as a "must-have". Given these requirements, video lectures available online are perceived as an effective replacement for student self-recording of classroom presentation (with dictaphones and mobile phones).

Additionally, participants suggested that having access to video lectures could compensate poor classroom experiences and classroom accessibility:

"Sometimes lectures can get quite crammed, so video lectures can be a good solution for it".
"People asking questions distract the flow of the lecture, but a video lecture… you can rewind it as many times as you like".
"It's hard to take notes as fast as some lecturers speak, and if you manage to write at that speed, your handwriting is going to be all over the places [..]. A video lecture can be watched at any time".

Students were generally positive on the idea that their own lecturers were going to produce original video content for the modules they teach:

"I don't want to be paying for something that I can access myself, like Youtube videos"

Four participants perceived the use of publicly accessible video resources for teaching as redundant.

The flipped classroom approach was also perceived as a welcomed innovation:

"A lot of the stuff on the presentations, are the book stuff, so they don't need to be really there [...]. You need more discussions and you need to be asking more questions".
"The discussion based session seems a good idea and it would be beneficial to get a better understanding of things".
"I do like the sound of that".
"I think it's a good idea, because some of the lectures go off tangents [during their presentation]".

A student with dyslexia particularly liked the idea of the video being concise and focused on the relevant themes:

"You would just be hearing the actual information, no just extra rubbish, that sometimes can be confusing in my mind" (*sic*).

All participant agreed that a video lecture would convey notions and concepts in a clearer way that a classroom presentation.

Based on past experiences, the issue of timing seemed quite important, as three participants agreed online content had to be made available online in advance to allow time to prepare possible questions and engage effectively with classroom activities:

"Sometimes some lecturers won't put up the slides [on Moodle] a few days before, they will put it right at that minute, so, when you go on it, it's too late to have a good look at them and come up with questions to ask" (*sic*).
"In some modules they have a lecture (presentation) and the following week they have a seminar about that lecture. By that time you have already forgotten about it".

When asked if they would actually watch a video lecture before attending a classroom session (if the lecture demanded so), one participant was unsure and the other four said they would. One participant made explicit reference to a possible performance:

"I would definitely watch it [the video presentation] before class. Having time to talk about stuff in groups would probably get us higher marks. Normally there's no time for that".

C. Video Lecture Web Template

The feedback on the overall look of the video lecture web template was generally positive: the main adjectives used to describe it were: "clean", "simple" and "intuitive". One student, based on the verbal description of the template before it was shown to the group, expected a more intricate and "obsolete" design.

In terms of individual components, positive feedback was given to the "contact details" and the "useful links" section. Two participants were keen to voice suggestions for lecturers on possible uses of this section:

"This [the Useful Links section] could be used for example to link to the appointment page of the Centre for Academic Success if the video is about statistics and research methods".

The "transcript" section generated a discussion around the accessibility of video and textual content. Three students stated it would be extremely difficult for them to access video content without a textual complement. When asked if they preferred captions (subtitles) or transcript, two (out of three) indicated that a transcript was generally a better option, as they could read it at their own pace. Four participants stressed the importance of being able (as a viewer) to change text and background colour of the "transcript" block.

There was a general expectation that the transcript text could also be downloaded as a file. Similarly, it was generally agreed that the possibility of downloading the video stream as a file was important. One participant suggested that her home Internet connection was often inadequate to stream lengthy video content.

In terms of additional features and functionalities, one student suggested a comment box. The group agreed on the usefulness of this feature and the group moved on to talk about possible benefits of video annotation, another suggested feature:

"It would be quite useful to be able to make notes on specific point of the video, like you can do on Soundcloud [the online audio distribution

platform]. So you don't need to use pen and paper and you can make notes on the go while using your iPad."

"It would great if I can then get all those notes in one place, so they can end up in my paper!"

D. Video Lecture format Examples

When students were presented with the three examples of video lecture format, they generally agreed that the two options containing the video of the presenter were better options. Two distinct reasons were suggested to justify this statement:

1) The need to rely on lip reading in order to better understand the spoken words;
2) The benefit of linking the narration to a (familiar) face, as a way of improving the attention of the viewer.

The group was generally sceptical that their own lecturer would match the quality and the clarity of the showcased self-generated examples.

The majority of students (four) preferred the professionally produced example to the self-generated videos. Although they were enquiring about the possibility of hiding, positioning and zooming in the presenter image on the screen:

"That one [the professionally produced video] definitely looks really nice and it makes you watch it. However, I would like the option to move the person to different places on the screen."

The professionally made video also triggered responses on perception and expectation dimensions: there was a general consensus on the fact that the lecturer (presenter) had invested more time in producing that resource:

"I really liked the third one [the professionally produced video], it just looks more professional. When you pay high fees, you just want it [the video] to look professional."

"The third one, you can tell he's put some effort. So, as you see the effort there, you feel like this is going to be a good presentation. I am going to get something out this presentation."

The professional look of the super-imposed presenter on the presentation triggered an expectation of good quality content and high production value.

V. DISCUSSION

A. Limitations of the Data

Due to the low maturity level of this study, the collected data are limited on different dimensions. The sample size is small and with a low degree of representativeness. Only five of 1,208 BCU students declaring a disability participated to this study. Also the disability categories were partially represented.

The high level of commitment required by the participation (over 1 hour focus group time) and the low remuneration value of the incentive (a lunchbox), possibly acted as a filter to recruit only those students

who are generally motivated and positively involved in University activities, hence the positive feedback on innovative teaching methods (i.e. flipped classroom).

B. Inclusive Curriculum Design

Although with limitations, the nature and the quality of the findings can be considered a good start in the disabled student engagement. This initial feedback will be used to inform and redefine inclusive design strategies, with the needs of students with disabilities at their core [11].

As expected, usability and accessibility were an essential part on the group conversation. However, the student feedback was not limited to addressing issues with disabled students access. On the contrary, many of the suggested improvements and the concerns around quality of the output could equally benefit the wider student community, including non-disabled students.

An underlying theme in the discussion was the comparison between classroom accessibility and online accessibility. The positive attitude towards the idea of engaging with video lectures was probably justified by the perception of a greater control over the pace and the format of the content being delivered. There were numerous references to negative experiences with note taking during classroom lectures, in contrast with a positive view of using multimedia learning resources. However, these have to be accessible online, downloadable and complemented with a transcript. These perceptions are generally in line with TechDis findings and guidelines [8].

From the University's point of view, these opinions could be a valuable starting point in the optimization of online and physical learning spaces. Research also seems to suggest that it is generally easier to adjust, complement, and, make accessible online learning resources, rather physical learning spaces, where difficulties and limitations are encountered due to cost, availability, and quality concerns [13], [19].

C. Online Video Lectures at BCU

Being in its testing phase, the video lecture web template will benefit from the feedback derived from the findings of this research. In particular, the "transcript" section needs to be made more accessible. Also, the general consensus that a transcript is perceived to be more effective than captions is in agreement with previous research [20].

An unexpected finding was the perception of teacher-generated video presentations being somehow associated with "less effort" on the teacher's side, and a lower production value overall. In fact, the teaching staff's effort, in terms of time and commitment, is far greater in the production of self-generated video lectures. Besides preparing the presentation, they have to learn how to use the screen capture software, familiarize themselves in the self-recording process, be in charge of quality control, perform some editing and be responsible of their online publishing through Moodle. The professional video recording option requires teaching staff to prepare their presentation, turn up at a specific time in a recording

studio and deliver their presentation to the camera. The professionals take care of the rest of the process.

Given the possible impact on student feedback in a context of increased competition within the Higher Education sector in the UK [21], this is an area that needs ad-hoc investigation.

D. Actions

A recurring theme in the group discussion related to the perception of the teaching staff's technical skills being often inadequate, when dealing with Moodle and online resources. However, the spectrum of experiences varies across modules, even within the same course of study.

This highlights the necessity of staff training and support, in-line with TechDis recommendations [8] and as a way to move towards the implementation of a more effective and consistent online learning experience for students.

VI. CONCLUSION

This work-in-progress research project is intended a first step towards an inclusive curriculum design, which is enhanced by blended learning approaches and enriched by (disabled) students' voice.

The data collection method suited the explorative nature of the study [22], which should be replicated with larger and more representative samples. However, in order to overcome sampling issues due to the lack of participation of the majority of the student population, different methods could be utilized in complementary research projects.

This project could perhaps make use of quantitative and mixed methods, which could be more effective at the implementation stage of blended learning approaches, when video lectures and other online resources are incorporated into curriculum design. For example, the analysis of Moodle logs and the tracking of video lecture web template user actions could provide useful insights, in terms of measurement of online student engagement and user interface accessibility.

To further explore accessibility issues of the video lecture page template, before its implementation, it would be appropriate to conduct further research, along the lines of Petrie and Kheir [23] and adopt a User Centered Design (UCD) approach similar to the one of Villena *et al.* [17].

Finally, disabled students' voice should be complemented with a wider stakeholder engagement, whereby the perspectives of BCU student community, teaching staff, course directors and management inform the implementation of blended approaches in an inclusive curriculum design.

REFERENCES

[1] E. F. Barkley, *Student Engagement Techniques: A Handbook for College Faculty*, United States: Jossey-Bass, 2009.

[2] H. Coates, *Student Engagement in Campus-Based and Online Education*, University Connections, United Kingdom: Taylor & Francis, 2006.

[3] W. Pluta, B. Richards, and A. Mutnick, "PBL and beyond: Trends in collaborative learning," *Teaching and Learning in Medicine*, vol. 25, S1, pp. S9-S16, 2013.

[4] J. O'Flaherty and C. Phillips, "The use of flipped classrooms in higher education: A scoping review," *The Internet and Higher Education*, vol. 25, pp. 85-95, 2015.

[5] Birmingham City University. (April 30, 2015). Birmingham City University Strategic Plan 2020. *Birmingham City University*. [Online]. Available: https://www.bcu.ac.uk/Download/Asset/04f847f1-8b80-4b5f-b2a4-866a589a8db3

[6] Z. Akyol and R. D. Garrison, "Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning," *British Journal of Educational Technology*, vol. 42, no. 2, pp. 233-250, 2011.

[7] V. M. López-Pérez, C. M. Pérez-López, and L. Rodríguez-Ariza, "Blended learning in higher education: Students' perceptions and their relation to outcomes," *Computers & Education*, vol. 56, no. 3, pp. 818-826, 2011.

[8] TechDis. (April 30, 2015). Improve 3 Rs. *TechDis*. [Online]. Available:http://www.ntu.ac.uk/adq/document_uploads/teaching/159039.pdf

[9] P. R. Lowenthal, B. Wilson, and P. Parrish, "Context matters: A description and typology of the online learning landscape," in *Proc. 32nd Annual Proceedings: Selected Research and Development Papers Presented at the Annual Convention of the Association for Educational Communications and Technology*, Washington DC: Association for Educational Communications and Technology, 2009.

[10] J. L. Moore, C. Dickson-Deane, and K. Galyen, "e-Learning, online learning, and distance learning environments: Are they the same?" *The Internet and Higher Education*, vol. 14, no. 2, pp. 129-135, 2011.

[11] J. K. Seale, *E-Learning and Disability in Higher Education: Accessibility Research and Practice*, United Kingdom: Routledge, 2013.

[12] TechDis. (April 30, 2015). About JISC TechDis. *TechDis*. [Online]. Available: http://blog.jisctechdis.ac.uk/?page_id=4

[13] R. S. Kushalnagar, W. S. Lasecki, and J. P. Bigham, "Captions versus transcripts for online video content," in *Proc. 10th International Cross-Disciplinary Conference on Web Accessibility – W4A '13*, May 2013, p. 32.

[14] R. Kheir and T. Way, "Inclusion of deaf students in computer science classes using real-time speech transcription," *ACM Sigcse Bulletin*, vol. 39, no. 3, pp. 261-265, June 2007.

[15] C. Jensema, "Viewer reaction to different television captioning speeds," *American Annals of the Deaf*, vol. 143, no. 4, pp. 318-324, 1998.

[16] A. B. Jordan, A. Albright, A. Branner, and J. Sullivan, "The state of closed captioning services in the United States," *National Captioning Institute Foundation*, pp. 1-47, 2003.

[17] J. M. R. Villena, B. C. Ramos, R. P. M. Fortes, and R. Goularte, "Web videos – concerns about accessibility based on user centered design," *Procedia Computer Science*, vol. 27, pp. 481-490, 2014.

[18] M. Marschark, P. Sapere, C. Convertino, and J. Pelz, "Learning via direct and mediated instruction by deaf students," *Journal of Deaf Studies and Deaf Education*, vol. 13, no. 4, pp. 546-561, 2008.

[19] R. S. Kushalnagar, W. S. Lasecki, and J. P. Bigham, "Accessibility evaluation of classroom captions," *ACM Transactions on Accessible Computing*, vol. 5, no. 3, pp. 1-24, 2014.

[20] F. Thorn and S. Thorn, "Television captions for hearing-impaired people: A study of key factors that affect reading performance," *Human Factors: The Journal of the Human Factors and Ergonomics Society*, vol. 38, no. 3, pp. 452-463, 1996.

[21] H. Carasso and R. C. Brown, *Everything for Sale? The Marketisation of UK Higher Education*, London: Taylor & Francis, 2013.

[22] C. Robson, *Real World Research*, United Kingdom: John Wiley & Sons, 2011.

[23] H. Petrie and O. Kheir, "The relationship between accessibility and usability of websites," in *Proc. SIGCHI Conference on Human Factors in Computing Systems*, 2007, pp. 397-406.

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