

Open Research Online

The Open University's repository of research publications and other research outputs

Accessibility in MOOCs: the stakeholders' perspectives

Book Section

How to cite:

Iniesto, Francisco; McAndrew, Patrick; Minocha, Shailey and Coughlan, Tim (2022). Accessibility in MOOCs: the stakeholders' perspectives. In: Rienties, Bart; Hampel, Regine; Scanlon, Eileen and Whitelock, Denise eds. Open world learning: research, Innovation and the Challenges of High-Quality Education. London: Routledge, pp. 119–130.

For guidance on citations see [FAQs](#).

© 2021 The Authors



<https://creativecommons.org/licenses/by-nc-nd/4.0/>

Version: Version of Record

Link(s) to article on publisher's website:

<http://dx.doi.org/doi:10.4324/9781003177098-11>

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's [data policy](#) on reuse of materials please consult the policies page.

oro.open.ac.uk

Accessibility in MOOCs

The stakeholders' perspectives

*Francisco Iniesto, Patrick McAndrew, Shailey Minocha
and Tim Coughlan*

9.1 Introduction

The reported work on how accessibility is embedded in the design of Massive Open Online Courses (MOOCs) seems to be limited (Sanchez-Gordon & Luján-Mora, 2017). At the same time, the need to incorporate greater access has been highlighted. Two significant events have contributed to the call for attention to the accessibility of online learning including MOOCs. The first event took place in 2015 when edX, a MOOC provider, had to reach an agreement to include accessible content on its platform. edX decided to change its policies and include accessibility in its software development cycle. The following excerpt from the settlement includes arguments that continue to be important (US Department of Justice, 2015, p. 1):

MOOCs have the potential to increase access to high-quality education for people facing income, distance, and other barriers, but only if they are truly open to everyone. This landmark agreement is far-reaching in ensuring that individuals with disabilities will have an equal opportunity to independently and conveniently access quality higher education online.

The second event in 2016 led to a different approach being taken by the University of California at Berkeley when facing a similar situation (Jaschik, 2016). The University of California decided to remove more than 20,000 audio and video files from its online open-access platforms, requiring learners to sign in with University of California credentials to view or listen to them instead of investing in making the content accessible. In both events, legislation was a driver for accessibility. Technologies used in MOOC platforms are not necessarily accessible (Sanchez-Gordon & Luján-Mora, 2017), which may then block access to learning for a significant number of learners. Furthermore, the use of videos within MOOCs, peer-to-peer assignments that involve learners evaluating each other's contributions, quizzes, and tests, or, in general, activities that increase the need for collaboration in online learning all can create additional challenges for accessibility (Rodrigo, Iniesto, & García-Serrano., 2020), see also Chapters 5 and 6 (Chua, 2022; Conde Gafaro, 2022).

MOOCs can be beneficial when compared to other online learning opportunities because of their characteristics of openness within a structured learning framework and low cost of learning (Iniesto, 2020). The scope of individual planning regarding learners' self-organisation of time, the use of their preferred devices/equipment, opportunities for social learning, and the chance to gain new knowledge are some additional advantages (Conde Gafaro, 2022). The importance of accessibility to online educational resources is widely acknowledged (Acosta & Luján-Mora, 2016), but there is limited discussion about the accessible design of online learning courses including MOOCs. Providing accessible MOOCs could offer the flexibility of learning and benefits to all learners. Indeed, the Porto Declaration on MOOCs (EADTU, 2014, p. 2) highlights the aspect of providing opportunities to all:

MOOCs must not be seen as the outcome or exemplar of online education. Rather they need to be understood in a wider context as there is a long history of research on open and online education and a variety of approaches and tools to provide quality learning opportunities to all.

A published report on inclusive teaching and learning in higher education (Department of Education, 2017) encourages higher education providers to care and offer support, and to develop an optimal environment for learners with accessibility needs. The lifelong learning paradigm integrates education, work, and personal life in a continuous process and allows learners to be able to access knowledge and develop it both personally and through work (Butcher & Rose-Adams, 2015). In this respect, if accessible, MOOCs have the characteristics to provide an appropriate mode of study for learners with accessibility needs. Chapter 9 summarises the doctoral research programme which has yielded an understanding of how MOOC providers cater for learners with accessibility needs, the motivations of those learners when taking part in MOOCs, and how MOOCs should be designed to be accessible (Iniesto, 2020).

9.2 MOOC Stakeholders and accessibility

When reviewing the literature, there is a lack of research about the efforts that MOOC providers are making towards MOOCs accessibility, the number of learners with accessibility needs and their interest in MOOCs, and the current state of MOOC accessibility (Iniesto, 2020). First, there is limited research on course team (authors') experiences of MOOCs, and how instructors/tutors are trained and interact with MOOC learners (Papathoma et al., 2020). In particular, little is known about how MOOC providers develop their platforms or courses by taking into account learners with accessibility needs. For example, Smith, Dowse, Soldatic, and Kent (2017) provided an overview of the process of developing a MOOC that included accessibility from the experiences of educators involved, whereby the authors aimed to explore what they named "disability pedagogy" in MOOCs. Smith et al. (2017) reflected that much of the work on MOOC development and

design was very ad hoc, showing how difficult it is to get development teams working together.

Second, in terms of the learners' perspective, it is often difficult to know the actual number of learners taking part in MOOCs (Guo & Reinecke, 2014). However, the definition of success needs to relate to the learner and finishing the MOOC is not necessary the goal for all learners (Liyanagunawardena, Parslow, & Williams, 2017). The motivations of online learners are diverse, and specifically for the MOOCs, as also indicated in Chapter 8 (Rizvi et al., 2022). Some learners at university level showed particular interest in "having a full-time job" (Ilgaz & Gulbahar, 2017) while using online environments for social interaction or leisure (Serdyukov & Serdyukova, 2015). Particular research on learners with accessibility needs participating in MOOCs has been investigated by Liu, Kang, and McKelroy (2015) who highlighted the importance of usable MOOC designs because difficult navigation and unintuitive interfaces can have a negative effect on the learning experience and perceptions of the course. Similarly, Park, Jung, and Reeves (2015) reinforced the idea that MOOCs can be a challenging experience and should be as flexible as possible to meet the needs of diverse learners.

Finally, the trend in many studies related to MOOC accessibility is towards technical reports where accessibility is evaluated using human–computer interaction (HCI) techniques and the Web Content Accessibility Guidelines (WCAG, 2018), a de facto standard of web accessibility. In these studies, expert evaluation dominates, where one or more accessibility experts applied certain heuristics using automatic tools (Akgul, 2018). Other authors complement heuristic evaluations with user-participation in the assessment process, such as users who were partially sighted, or have other visual impairments (Królak, Chen, Sanderson, & Kessel, 2017), or the elderly (Bong & Chen, 2016). Most published studies report evaluating a single MOOC and corresponding platform and often involve vision impaired learners as participants. For a better understanding of the accessibility barriers in MOOCs, studies should be conducted that cover a combination of different accessibility evaluation methods and a broader sample of end-users with diverse accessibility needs and not just visual impairment.

As Seale (2014) argued, there is a need to understand the multiple viewpoints of stakeholders in accessibility practice. Research with MOOC providers is needed to capture their practices and constraints of integrating accessibility. Furthermore, the motivations and barriers of the learners who have accessibility requirements need to be investigated. For example, Rodrigo and Iniesto (2015) argued the need to provide a holistic vision for creating accessible MOOCs. Therefore, several HCI accessibility evaluation methods are needed to evaluate MOOCs, to provide indicators of the accessibility barriers and to develop processes to be addressed. Therefore, the following research questions are addressed in Chapter 9:

- 1 How do MOOC providers cater for learners with accessibility needs?
- 2 What are the motivations of learners with accessibility needs when taking part in MOOCs?
- 3 How can MOOCs be made accessible for learners with accessibility needs?

9.3 Researching accessibility in MOOCs

The research has taken a study-based approach; each study having its own research design, and methods of data collection and data analysis. The results from the studies are then related to each other and consolidated to address the research aims of the programme, and to draw out implications and directions for further work. The identification of appropriate methods for the research design was shaped by the ethical considerations of research that involved vulnerable groups involved with online learning (Farrow, 2016).

A pragmatic methodology was selected for this research which included qualitative, quantitative and HCI methods. That pragmatic approach suggested is demonstrated in the literature on MOOC research. Liyanagunawardena, Adams, and Williams (2013) pointed out that in the initial stage of MOOCs, the period from 2008 to 2012, the majority of research used multiple methods for data collection: primarily online surveys; and via interviews, focus groups and collecting platform analytics. Gasevic, Kovanovic, Joksimovic and Siemens (2014) proposed the use of mixed methods for research in MOOCs, by recognising the complexity of massiveness and openness of MOOCs. In a review that focused on 2013–2015 literature, Veletsianos and Shepherdson (2016) indicated that researchers favoured quantitative approaches with survey data and secondary data collected via automated methods, and qualitative methods informed few studies. Joksimović et al. (2018) in their systematic literature review pointed out the lack of generalisability of current results in MOOC research. As the literature review shows and Evans, Baker, and Dee (2016) suggest, research on MOOCs needs to focus on research approaches across different domains and multiple methods.

In this research design, research methods that require collecting perspectives from stakeholders were included: qualitative studies with MOOC providers and learners with accessibility needs facilitated understanding of their views (RQ1 and RQ2) and the way accessibility of MOOCs can be improved (RQ3). Quantitative studies were used to understand the demographics and motivations of learners (RQ2) and to draw out initial ideas on barriers (RQ3). A systematic tool called the MOOC accessibility audit based on the heuristic evaluation method of expert usability evaluation in the HCI literature was developed in this project. The audit tool involved expert-based evaluation (conducted by usability/accessibility experts) to detect accessibility barriers (RQ3). The mapping between research questions and methods in the three studies are shown in Figure 9.1.

In Study A, semi-structured interviews involved 26 MOOC providers and researchers, such as accessibility managers, course editors, inclusion designers, instructional designers, learning media developers and software developers (Iniesto, McAndrew, Minocha, and Coughlan, 2016). The aim was to explore the perspectives of platform and course providers on the importance of accessibility of the MOOC environment. The data from this study was useful to understand on how to approach the next components of the research programme. Interviewing individuals involved in MOOC development (MOOC providers) helped to understand how they catered for learners with accessibility needs (RQ1), and the

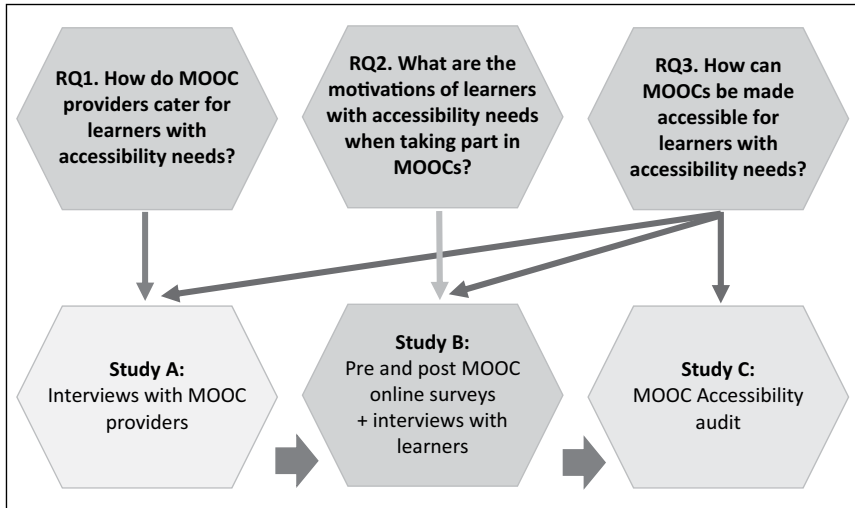


Figure 9.1 Research questions, studies and methods.

approaches they used to design accessible MOOCs (RQ3). Thematic analysis (Lapadat, 2009) was chosen for (qualitative) analysis of the data from these exploratory interviews.

Study B employed pre- and post-online survey data from past 14 Open University's MOOCs in FutureLearn (with 29,000 and 5,000 respondents) (Iniesto, McAndrew, Minocha, and Coughlan, 2017). The survey data was provided to the research team by FutureLearn who run pre- (at the start of the MOOC) and post-surveys (on completion of the MOOC) with their learners. The analysis of survey data provided preliminary insights related to research questions, RQ2 and RQ3, and was a source of secondary data as a precursor to interviews in Study B. Study B involved interviews with 15 learners with accessibility needs who had participated in MOOCs and filled up the course-surveys. The data from the semi-structured interviews helped to understand their motivations (for RQ2), the accessibility barriers they found, whether/how they worked around the barriers, and their suggestions for desired solutions (RQ3). It was essential to understand the individual situations learners had when working with MOOCs and to consider their varied contexts. Like in study A, thematic analysis was used for the analysis of the interviews, and survey data provided triangulation.

Study C was developed to understand how to improve the accessibility in MOOCs (RQ3) from an expert evaluation perspective (Iniesto, McAndrew, Minocha, and Coughlan, 2019). The study employed an accessibility audit which was conducted on four MOOCs from FutureLearn, Coursera, edX and Canvas. The audit-instrument was developed as a part of the research programme. The audit-instrument was comprised of four main evaluation areas and, therefore, four different checklists to apply heuristic evaluations (Petrie & Bevan, 2009):

- Technical accessibility evaluation. Checking of conformance to guidelines through WCAG (2018) and the text-based files.
- User experience (UX) evaluation. The evaluation of usability and user experience characteristics of the user interface design and pedagogical design.
- Quality evaluation. Evaluation of MOOC's properties, the quality of the design, platform and support for learners.
- Learning design evaluation. Evaluation of the learning design characteristics within MOOCs using Universal Design for Learning (UDL).

(See Chapter 15, Iniesto & Hillaire, 2022)

RQ3 was answered through three complementary studies. The findings from user-based studies were reinforced by the results from the audit which revealed further barriers. As a consequence of having different samples when merging research methods, the combination of methods allowed triangulation, to bring together complementary data interpretation and for checking validity (Creswell & Clark, 2017).

9.4 Main findings across the three studies

The combination of qualitative studies through interviews with MOOC providers and learners, and the quantitative information provided by the MOOC survey data provided an in-depth and multi-faceted insight into the accessibility needs of MOOC learners. The MOOC accessibility audit helped to identify accessibility barriers and the audit-instrument provides a tool that can be used and iteratively developed further to support the design and evaluation of MOOCs for accessibility.

9.4.1 MOOC providers cater for learners with accessibility needs (RQ1)

There is an awareness amongst the MOOC providers of learners with accessibility needs participating in MOOCs. However, in the investigations in this research programme, the providers have acknowledged limitations. For example, MOOC providers often do not know who is participating in their MOOCs which leads to a lack of understanding of their learners, and in particular learners with accessibility needs. MOOC providers do not gather accessibility information or requirements from their learners as is typical of other educational environments (Porter, 2014). Providers are, therefore, missing an opportunity to get more comprehensive feedback from learners to help them better support accessibility over time.

MOOC providers agreed that the technology of the platforms is creating barriers. MOOCs use social media, third-party software and technologies that may not be accessible for all learners. Therefore, MOOC providers prioritise legislation over learners' preferences and needs for MOOC accessibility. These factors have a direct influence in limiting the availability of accessible educational resources as

MOOC providers are not designing the educational resources for different target user-groups and are not allowing personalisation of the learner experience as a strategy to overcome accessibility barriers.

9.4.2 The motivations of learners when taking part in MOOCs (RQ2)

The motivations of learners with accessibility need to participate in MOOCs are broad and depend on factors already identified for MOOC learners (Ilgaz & Gulbahar, 2017; Serdyukov & Serdyukova, 2015). Learners with accessibility needs reported that they find MOOCs useful for personal development and continuing professional development, and as a route for access to higher education. As MOOC providers, they consider the low cost of MOOCs to be an important factor. But learners reported that some of these motivations are at risk since, low cost and openness are not a priority in the recent business models being adopted by MOOC providers (Ruipérez-Valiente, Martín, Reich, & Castro, 2020). Finally, MOOCs allow social interaction, which is facilitated by their massiveness and that learners can work from their preferred environment (for example at home with a laptop that includes assistive technologies). This flexibility helps learners in their self-regulated learning experience (Conde Gafaro, 2022).

9.4.3 Making MOOCs more accessible (RQ3)

The three studies of the research programme being reported have provided rich data, much of which aligns with other findings on accessibility and UX barriers in reported research on other (non- MOOC) online learning environments (Acosta & Luján-Mora, 2016). Those findings linked to technical aspects have also been highlighted by MOOC researchers (Akgul, 2018; Bong & Chen, 2016; Królak et al., 2017). In line with Straumsheim (2017), repeated identification of barriers indicates the slow speed in improving accessibility of educational technology and, hence, MOOCs; the same barriers are repeatedly identified, but solutions have not been provided as yet.

The studies within this research have been innovative in terms of identifying quality and pedagogical accessibility barriers, which have not been comprehensively explored in previous research (Park, Jung, & Reeves, 2015). These barriers can be caused by the way MOOCs are limited to a specific time frame generating barriers for many learners who cannot follow the workload included each week in the courses. As reported, the term open is also creating friction within the stakeholders: often in current MOOCs, the entire educational content is not available from the beginning, or access to it is lost when the course is finished.

Accessibility barriers in MOOCs can be found in several touchpoints of the learner journey, including the registration processes, search pages, information provided before enrolling, in carrying out assignments or the use of discussions. Previous research has developed legislation, frameworks and services to address accessibility in MOOCs (Sanchez-Gordon & Luján-Mora, 2017). However,

MOOC providers reported a limited ability to address barriers when MOOCs are being run. Learners indicated different ways they had responded to find ways to cope with accessibility barriers; these workarounds though were far from the desired solutions. The massiveness intended of MOOCs further implies a greater predisposition to be available, improvements in the help reporting services need to be in place in advance.

9.5 Discussion and implications for the future

Chapter 9 aimed to develop an understanding of stakeholders' perspectives from both the producer and learner communities. Those aspects are aligned with the open world learning approach of this book by providing accessible educational resources and platforms to reduce the digital divide. This research reveals openness as an enabler against the new MOOC business models and "technical disruption" such as accessibility are restricting opening up education to a large/massive scale.

Ferguson et al. (2018) describe a set of eight priority areas for MOOC development one of which is "wide access" built on accessibility and including those learners who are excluded from education. This research has reinforced the argument that to achieve wide access other priority areas need to be achieved, such as: "develop appropriate pedagogies", "develop effective learning designs", "clarify learner expectations", "develop educator teams" (in accessibility), and "develop new approaches to assessment and accreditation". A holistic approach to increasing accessibility in those areas will help widen access to all learners. In line with the need for having a holistic approach of embracing accessibility in MOOCs discussed in Rodrigo and Iniesto (2015), contributions from this research can lead to future research areas. MOOC accessibility research needs to consider technical and pedagogical aspects, and participatory approaches of including both MOOC providers and learners in accessible MOOC design.

Future research with learners may involve focussing on case studies with particular accessibility needs in order to understand those needs in-depth. Such an approach would avoid medical models of clustering learners with accessibility needs and allow a "putting people and processes first" perspective (Cooper, Sloan, Kelly, & Lewthwaite, 2012). Possible other sources of data may also be considered such as surveys included in accessibility-related MOOCs and analysis of the activity data of learners participating in MOOCs (Cooper, Ferguson, & Wolff, 2016). Another possible research area could be development of guidelines to support audit evaluations during the MOOC design and development processes (for platforms and educational resources) rather than post-implementation of MOOCs. These guidelines could be integrated in the process model for MOOC design. To help achieve such guidelines which are (and should be) iteratively developed to meet learner needs, participatory research methods of involving learners in the design processes should be considered (Toetenel & Bryan, 2015).

As Ferguson, Sharples, and Beale (2015) suggest, MOOCs need to evolve to meet societal needs building on advances in technology, and so future research should continue developing accessibility profiling standards and their practical

applications in open education (Navarrete & Luján-Mora, 2018). As well as continuously gathering feedback from learners, the requirements of learners evolve and, also, with the technological changes, there will be accessibility barriers which the learners may not have encountered before. Obtaining feedback from learners enables MOOC providers to adapt the platform designs and educational resources to meet the accessibility requirements of learners. Further research could also consider the role of learning analytics in addressing accessibility of MOOCs (Cooper, Ferguson, & Wolff, 2016) and aspects such as how learner-emotions affect learning (Hillaire, Iniesto, & Rienties, 2019).

While universal design encourages active consideration of learners with accessibility needs (Iniesto & Hillaire, 2022), an extended approach should focus on designing for diversity. Learners have diverse needs, and, in practice, an approach that addresses diversity leads to a model of alternative solutions around a core learning design. This preferred design approach for diversity is also referred to as inclusive design; it seeks to augment a central design by adding in a consideration of particular learner groups so that they are included, potentially through alternative design solutions rather than one design solution (Clarkson et al., 2013). Inclusive learning design aims to avoid the trap of looking at the technology that is needed for implementation but instead considers learning design in terms of learning goals, a model of pedagogy, and pattern of interactions of those involved (Toetenel & Bryan, 2015). This approach is aligned to that implemented at The Open University in its aims to “strike the right balance between digital augmentation and the human element in providing accessible services” (McAndrew, Farrow, & Cooper, 2012, p. 16).

9.5.1 Implications for practice

While Chapter 9 has shown that there are inherent challenges in accessible MOOC production, they are integral to any online learning course production in an agile development methodology. As a general approach, online course providers should seek a better understanding of their learners and their needs. The interests of learners with accessibility needs are varied and findings from previous research have not focused on accessibility. Any online course development processes need to be reviewed from the early design stages to produce accessible content, and the focus should change from meeting legislative requirements to actually meeting learners’ needs. Therefore, to make online courses more accessible, it is necessary to put in place processes to identify accessibility barriers, to strengthen mechanisms that involve the participation of learners in course design, and to facilitate agile response in addressing barriers.

References

- Acosta, T., & Luján-Mora, S. (2016). *Comparison from the levels of accessibility on LMS platforms that supports the online learning system*. In L. Gómez Chova, A. López Martínez & I. Candel Torres (Eds.), *8th annual international conference on education and new learning technologies*. IATED Academy.

- Akgul, Y. (2018). Web accessibility of MOOCs for elderly students: the case of Turkey. *Journal of Life Economics*, 5(4), 141–150.
- Bong, W. K., & Chen, W. (2016). How accessible are MOOCs to the elderly? In *International conference on computers helping people with special needs* (pp. 437–444). *Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics*, 8547 LNCS (Part 1), 145–152.
- Butcher, J., & Rose-Adams, J. (2015). Part-time learners in open and distance learning: Revisiting the critical importance of choice, flexibility and employability. *Open Learning: The Journal of Open, Distance and e-Learning*, 30(2), 127–137.
- Chua, S. M. (2022). Discourse practices in MOOC discussions: a corpus linguistic approach. In B. Rienties, R. Hampel, E. Scanlon, & D. Whitelock (Eds.), *Open World Learning: Research, Innovation and the Challenges of High-Quality Education* (pp. 76–88). London: Routledge.
- Clarkson, P. J., Coleman, R., Keates, S., & Lebbon, C. (2013). *Inclusive design: design for the whole population*. Springer Science & Business Media.
- Conde Gafaro, B. (2022). First steps towards self-regulated learning: setting goals in MOOCs. In B. Rienties, R. Hampel, E. Scanlon, & D. Whitelock (Eds.), *Open world learning: research, Innovation and the Challenges of High-Quality Education* (pp. 63–75). London: Routledge.
- Cooper, M., Ferguson, R., & Wolff, A. (2016). What can analytics contribute to accessibility in e-learning systems and to disabled students' learning? In S. Gasevic & G. Lynch (Eds.), *Proceedings of the sixth international conference on learning analytics & knowledge* (pp. 99–103). Association for Computing Machinery.
- Cooper, M., Sloan, D., Kelly, B., & Lewthwaite, S. (2012). A challenge to web accessibility metrics and guidelines: Putting people and processes first. In *W4A 2012: 9th international cross-disciplinary conference on web accessibility*, Lyon, France.
- Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage publications.
- Department of Education. (2017). *Inclusive teaching and learning in higher education. Access to higher education and Higher education participation* (Independent Report). UK Government. <https://www.gov.uk/government/publications/inclusive-teaching-and-learning-in-higher-education>
- EADTU. (2014). *Porto Declaration on European MOOCs*. EADTU. <https://home.eadtu.eu/news/90-porto-declaration-on-european-moocs-available-online>
- Evans, B. J., Baker, R. B., & Dee, T. S. (2016). Persistence patterns in massive open online courses (MOOCs). *The Journal of Higher Education*, 87(2), 206–242.
- Farrow, R. (2016). A framework for the ethics of open education. *Open Praxis*, 8(2), 93–109.
- Ferguson, R., Herodotou, C., Coughlan, T., Scanlon, E., & Sharples, M. (2018). MOOC development: Priority areas. In *Enhancing learning and teaching with technology what the research says*. London: UCL IOE Press.
- Ferguson, R., Sharples, M., & Beale, R. (2015). MOOCs 2030: a future for massive open online learning. In *MOOCs and open education around the world* (pp. 315–326). London and New York: Routledge.
- Gasevic, D., Kovanovic, V., Joksimovic, S., & Siemens, G. (2014). Where is research on massive open online courses headed? A data analysis of the MOOC research initiative. *The International Review of Research in Open and Distributed Learning*, 15(5), 134–176.
- Guo, P. J., & Reinecke, K. (2014). *Demographic differences in how students navigate through MOOCs*. In M. Sahami & A. Fox (Eds.), *Proceedings of the first ACM conference on Learning@ scale conference* (pp. 21–30). Association for Computing Machinery

- Hillaire, G., Iniesto, F., & Rienties, B. (2019). Humanising text-to-speech through emotional expression in online courses. *Journal of Interactive Media in Education*, 1, 12.
- Ilgaz, H., & Gulbahar, Y. (2017). Why do learners choose online learning: the learners' voices. International Association for Development of the Information Society (IADIS) International Conference on E-Learning. *International Association for Development of the Information Society*.
- Iniesto, F. (2020). *An investigation into the accessibility of massive open online courses (MOOCs)* (Doctoral dissertation, The Open University). <http://oro.open.ac.uk/70010/>
- Iniesto, F., & Hillaire, G. (2022). UDL and its implications in MOOC accessibility evaluation. In B. Rienties, R. Hampel, E. Scanlon, & D. Whitelock (Eds.), *Open world learning: research, innovation and the challenges of high-quality education* (pp. 208–224). London: Routledge.
- Iniesto, F., McAndrew, P., Minocha, S., & Coughlan, T. (2016). Accessibility of MOOCs: understanding the provider perspective. *Journal of Interactive Media in Education*, 2016(1), 1–10.
- Iniesto, F., McAndrew, P., Minocha, S., & Coughlan, T. (2017). What are the expectations of disabled learners when participating in a MOOC? In C. Urrea, J. Reich & C. Thille (Eds.), *Proceedings of the fourth (2017) ACM conference on learning@ Scale* (pp. 225–228). Association for Computing Machinery.
- Iniesto, F., McAndrew, P., Minocha, S., & Coughlan, T. (2019). Auditing the accessibility of MOOCs: a four-component approach. In *European conference on technology enhanced learning* (pp. 650–654). Cham: Springer.
- Jaschik, S. (2016). *University may remove online content to avoid disability law*. <https://www.insidehighered.com/news/2016/09/20/berkeley-may-remove-free-online-content-rather-complying-disability-law>
- Joksimović, S., Poquet, O., Kovanović, V., Dowell, N., Mills, C., Gašević, D., Dawson, S., Graesser, A. C., & Brooks, C. (2018). How do we model learning at scale? A systematic review of research on MOOCs. *Review of Educational Research*, 88(1), 43–86.
- Królak, A., Chen, W., Sanderson, N. C., & Kessel, S. (2017). The accessibility of MOOCs for blind learners. In A. Hurst & L. Findlater (Eds.), *Proceedings of the 19th international ACM SIGACCESS conference on computers and accessibility* (pp. 401–402). Association for Computing Machinery.
- Lapadat, J. (2009). Thematic Analysis. In A. J. Mills, G. Durepos, & E. Wiebe (Eds.), *Encyclopedia of case study research: L-Z; index* (Vol. 1). London: Sage.
- Liu, M., Kang, J., & McKelroy, E. (2015). Examining learners' perspective of taking a MOOC: reasons, excitement, and perception of usefulness. *Educational Media International*, 52(2), 129–146.
- Liyaganawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs: A systematic study of the published literature 2008–2012. *The International Review of Research in Open and Distributed Learning*, 14(3), 202–227.
- Liyaganawardena, T. R., Parslow, P., & Williams, S. A. (2017). Exploring 'success' in MOOCs. In R. Bennett & M. Kent (Eds.), *Massive Open Online Courses and Higher Education: What Went Right, What Went Wrong and Where to Next?* (pp 92–109). London and New York: Routledge.
- McAndrew, P., Farrow, R., & Cooper, M. (2012). Adapting online learning resources for all: Planning for professionalism in accessibility. *Research in Learning Technology*, 20, 345–361.
- Navarrete, R., & Luján-Mora, S. (2018). Bridging the accessibility gap in Open Educational Resources. *Universal Access in the Information Society*, 17(4), 755–774.
- Papathoma, T., Ferguson, R., Iniesto, F., Rets, I., Vogiatzis, D., & Murphy, V. (2020). Guidance on how Learning at Scale can be made more accessible. In D. Joyner, R. Kizilcec & S. Singer (Eds.), *Proceedings of the seventh ACM conference on learning@ Scale* (pp. 289–292). Association for Computing Machinery.

- Park, Y., Jung, I., & Reeves, T. C. (2015). Learning from MOOCs: A qualitative case study from the learners' perspectives. *Educational Media International*, 52(2), 72–87.
- Petrie, H., & Bevan, N. (2009). The evaluation of accessibility, usability and user experience. In C. Stephanidis (Ed.), *The Universal Access Handbook* (pp. 1–15). CRC press.
- Porter, J. (2014). *Understanding and Responding to the Experience of Disability*. London and New York: Routledge.
- Rizvi, S., Rienties, B., Kizilcec, R., & Rogaten, J. (2022). Culturally adaptive learning design: a mixed-method study of cross-cultural learning design preferences in MOOCs. In B. Rienties, R. Hampel, E. Scanlon, & D. Whitelock (Eds.), *Open World Learning: Research, Innovation and the Challenges of High-Quality Education* (pp. 103–116). London: Routledge.
- Rodrigo, C., & Iniesto, F. (2015). *Holistic vision for creating accessible services based on MOOCs*. In *Open education global conference 2015*. Innovation and Entrepreneurship, Banff, Alberta.
- Rodrigo, C., Iniesto, F., & García-Serrano, A. (2020). Reflections on Instructional Design Guidelines From the MOOCification of Distance Education: A Case Study of a Course on Design for All. In *UXD and UCD Approaches for Accessible Education* (pp. 21–37). IGI Global. Pennsylvania: Hershey.
- Ruipérez-Valiente, J. A., Martín, S., Reich, J., & Castro, M. (2020). The UnMOOCing Process: Extending the Impact of MOOC Educational Resources as OERs. *Sustainability*, 12(18), 7346.
- Sanchez-Gordon, S., & Luján-Mora, S. (2017). Research challenges in accessible MOOCs: A systematic literature review 2008–2016. *Universal Access in the Information Society*, 1–15.
- Seale, J. (2014). *E-learning and disability in higher education: Accessibility research and practice*. London and New York: Routledge
- Serdyukov, P., & Serdyukova, N. (2015). Effects of communication, socialization and collaboration on online learning. *European Scientific Journal, ESJ*, 11(10).
- Smith, L., Dowse, L., Soldatic, K., & Kent, M. (2017). Developing a MOOC: factoring in disability. In *Massive Open Online Courses and Higher Education: What Went Right, What Went Wrong, and Where to Next?* (pp. 123–134). London and New York: Routledge.
- Straumsheim, C. (2017). 'Glacial Progress' on Digital Accessibility. *Inside Higher Ed*. <https://www.insidehighered.com/news/2017/05/18/data-show-small-improvements-accessibility-course-materials>
- Toetenel, L., & Bryan, A. (2015). *Designing for inclusion: Supporting disabled students in a distance learning context*. In *Proceedings of the 1th D4|learning international conference innovations in digital learning for inclusion* (pp. 20–24). European Distance and E-Learning Network.
- US Department of Justice. (2015). *Justice Department Reaches Settlement with edX Inc*. <http://www.justice.gov/usao-ma/pr/united-states-reaches-settlement-provider-massive-open-online-courses-make-its-content>
- Veletsianos, G., & Shepherdson, P. (2016). A Systematic Analysis and Synthesis of the Empirical MOOC Literature Published in 2013–2015. *The International Review of Research in Open and Distributed Learning*, 17(2).
- WCAG (2018). *Web Content Accessibility Guidelines (WCAG) Overview*. <https://www.w3.org/WAI/standards-guidelines/wcag/>