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TEACHING REFLECTION

Open Educational Resources as the Third Pillar in Project-Based Learning During COVID-19: The Case of #dariahTeach

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Teaching in higher education in the Netherlands was affected, as in most other parts of the world, due to the COVID-19 pandemic. This paper reflects on how two courses were taught and experienced by students during the 2020–21 academic year in the MA Media Studies: Digital Cultures at Maastricht University. It particularly focuses on how the integration of open educational resources into the course design, what we call a *third pedagogic pillar*, contributed to the success of the two courses and students' positive learning experience.

Keywords: open educational resources; project-based learning; problem-based learning; media studies; digital cultures; COVID-19

Introduction

Teaching in higher education in the Netherlands has been affected, as in most other parts of the world, due to the COVID-19 pandemic. At Maastricht University (UM), teaching in the 2020–21 academic year went from a fairly optimistic first term (September–November), in which students by and large attended classes in person while adhering to social distancing measures, to an increasingly fragmented and constrained teaching environment in our second term (November–December), in which we rapidly pivoted to a good deal of online teaching and blended learning (with some students in the physical classroom and others attending remotely, i.e., Zooming in). As a result of these circumstances, we were forced to migrate to "emergency remote teaching," i.e., "to provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis" (Hodges et al. 2000, para. 13). For many instructors, this shift entailed the deployment of educational methods that were not adequately designed, tested, or supported by students' or institutions' available digital infrastructures (Nuere and de Miguel 2020). However, instructors in the master's in Media Studies: Digital Cultures (MADC) at UM had incorporated open educational resources (OERs) into course design pre-COVID and were thus fairly well equipped to adapt to emergency remote teaching. This paper reflects on how two courses were taught and experienced by students during the 2020–21 academic year in the MADC at UM, particularly focusing on how OERs contributed to the students' positive learning experience during COVID-19.

Maastricht University is the most international of Dutch universities. The majority of academic programmes are in English, and the student body is extremely international (in 2019, 54 percent of the student population was foreign, representing 114 nationalities). UM takes pride in its educational ethos of problem-based learning. The two courses described here, Design Thinking & Maker Culture (DT&M, offered in November–December 2020) and Creating Digital Collections 1 (CDC1, offered in January 2021) and Creating Digital Collections 2 (CDC2, offered in February–March 2021) extend the problem-based learning philosophy into project-based learning, taking a critical making approach to research-based teaching

(van der Rijst 2017).[1] The pivot to first blended and then fully online synchronous teaching posed challenges for both problem- and project-based learning, in which students are accustomed to a great deal of team and group work within active learning environments (Hyun, Ediger, and Lee 2017) that rely on collaboration and mentorship from instructors, both inside and outside the classroom.

Despite the challenges presented by the pandemic, these courses received favourable student feedback. Moreover, the quality of the online projects for both courses (described in more detail below) was as high as what we would expect in classes less challenged by externalities. We argue that some of this success is due to what we call a *third pedagogic pillar* integrated into the course design, that of OERs. Specifically, OERs were introduced via #dariahTeach (2021), a peer-reviewed platform for the digital arts and humanities. OERs were embedded into both courses in order to provide learners with self-directed, interactive, and engaging learning experiences (Martin et al. 2019). This third pillar created an additional pedagogic space for our students alongside the classroom (the first pillar), be it online or virtual, and more traditional secondary sources (articles, monographs, websites, videos, etc.), the second pillar. Students found #dariahTeach not only an intuitive and enjoyable active learning experience—in great measure due to the multiplicity of modes, including engaging self-testing modalities—but also a way to structure and organise their days, a boon to the feeling of the never-ending sameness of our lives during the pandemic. Moreover, the integration of #dariahTeach's OERs in what were essentially online critical making processes resembles how students create and navigate information and knowledge outside academia. Based on this year's experience with designing and teaching these two courses, this paper argues that online, multimodal, and project-based ways of learning should be fundamental to how we teach in the post-pandemic classroom. In the following sections, we will first define problem-based and project-based learning, then describe OERs available through #dariahTeach, provide overviews of the curriculum design for both courses, and summarize student feedback.

Problem-Based Learning, Project-Based Learning, and Open Educational Resources

The courses discussed in this article use OERs through a specific platform, #dariahTeach, and within a specific pedagogical framework. UM is renowned for its problem-based learning (PBL) pedagogy. PBL has its origins in Canadian educational practice in the field of medicine in the late 1960s (Servant-Miklos 2019a; Servant-Miklos 2019b; Savery 2006; Barrows 1994) and was developed as a means of cultivating problem-solving skills and enabling critical reflection on real-world cases that could not be achieved via the more typical instruction methods (e.g., lecturing) that encouraged individual work and memorisation. UM's PBL pedagogy is based on four learning principles: constructive, self-directed, collaborative, and contextual (Dolmans et al. 2005). *Constructive* emphasises an active learning process in which knowledge is gained "as you go" through interactions with the environment in which learning takes place and the experiences formulated in this process. *Self-directed* refers to students' responsibility in planning, monitoring, and evaluating the learning process, whereas the instructors have a supporting role, guiding discussions and facilitating interactions when deemed necessary. Working in small groups around the same problem also ensures that learning is a *collaborative* process and a shared responsibility through which one learns from and builds upon the other. Lastly, by learning in real-life *contexts* and using timely and societally relevant case studies, students develop competencies in turning theory into practice while integrating knowledge and skills. In a nutshell, in PBL "knowledge is acquired, synthesized, and appraised out of working through and reflecting upon–in facilitated small group work and self-directed learning–a progressive and stimulating framework of context-setting problems" (Maudsley 1999, 182).

PBL is part of the broader family of active learning pedagogies, together with inquiry-based, case-based, discovery-based, and project-based learning (Hood Cattaneo 2017; for a summary of different constructivist approaches, see Chu et al. 2021, 3–16). Similar to PBL, project-based learning (abbreviated here as PjBL after Guo et al. 2020 to avoid confusion with PBL) is also learner-centred and typically involves the development of a publicly accessible output that addresses a particular authentic challenge, driving question, or problem (Blumenfield et al. 1991; Krajcik and Shin 2014).[2] The main difference between PBL and PjBL is that the former emphasizes knowledge application, and the latter involves knowledge creation. In other words, the project is not another tool for learning or a product that is only shaped at the end of the learning process/instruction period, as is the case with summative assessments, but the entire course curriculum is designed to support and develop it (Thomas 2000). Therefore, all the stages involved in the development of the public output are part of a carefully designed curriculum that provides learners with the knowledge, skills, and competencies to

[1] DT&M was taught by Susan Schreibman and Claartje Rasterhoff. CDC was taught by Costas Papadopoulos and Susan Schreibman.

[2] The products of PjBL curricula may well, in themselves, becomes OERs, as was the case with the project created in the CDC course the previous year, in which students not only digitised in 3D a collection of objects from the Nederlands Mijnmuseum aimed at the general public but also created a bespoke section geared towards children aged 10–12 because this is the age group that most typically visits the museum. See the "Education" section of https://mining3d-umfasos.nl/.

critically approach an intellectually challenging problem or question. According to Thomas (2000), another essential feature of PjBL is that projects are not prescribed and therefore students can choose different paths or directions. Since students are not constantly supervised and teachers take on the role of a coach to provide advice and suggestions for improvement, outcomes are often unpredictable and disturb the linearity of conventional instruction methods (Wurdinger 2005, 69). Therefore, students also develop project and time management skills that are essential to ensure the timely and efficient fulfilment of the project. What further distinguishes PjBL from PBL is that the project work may involve external professionals and subject experts, partnerships with institutions, and a collaborative approach of knowledge creation that goes beyond the class and/or institutional settings (e.g., by involving museum curators, subject experts, amateur groups, etc.). Contrary to PBL, which focuses on knowledge application, PjBL is based on knowledge creation, thus cultivating "innovation competence" (Guo et al. 2020) and "skills for the future" (Bell 2010; also see Binkley et al. 2012).

The openness and flexibility of PjBL means that student learning is facilitated in different ways than in more conventional and rigid pedagogies. Therefore, teachers face challenges in terms of their confidence to integrate and support different learning modalities as well as students' resistance to what can be an ambiguous and fluid learning environment (Brush and Saye 2000; Ertmer and Simons 2005; Grant and Hill 2006). The preparation of diverse learning material, instructional methods, and tools that facilitate group work is essential in supporting students' self-direction in PjBL. OERs can support the preparation of such diversity in learning material and the process of student learning that typically occurs in PjBL.

As mentioned above, the two courses discussed in this paper utilised OERs from #dariahTeach in their PjBL-informed pedagogic design. OERs are "educational resources that are openly available for use by educators and students, without an accompanying need to pay royalties or license fees" (Butcher 2015, 5). They have been extensively used in higher education, to support not only distance learning (Cheung 2017) and blended learning (Sandanayake 2019) but also less typical instruction methods, such as the flipped classroom (Bishop and Verleger 2013; Li et al. 2017). OERs promote lifelong learning, encourage independent and critical thinking, enable flexibility, and create the conditions for fair access to both training and education (Butcher 2015, 6; Berti 2018). They, therefore, benefit different stakeholders, including learners, educators, institutions, and policy makers (Hodgkinson-Williams 2010, 8–10). Because of their diverse and often multimodal and interactive nature, OERs—together with more typical, face-to-face or virtual synchronous instructional methods and conventional learning resources—can, when properly designed and integrated into course design, support different learning situations. They can also result in positive experiences for both instructors and learners as well as fulfil learning outcomes that are similar to those achieved without the use of OERs (Hilton 2019). In the case of the courses discussed in this article, we used OERs offered through #dariahTeach and the IGNITE curriculum.

Open Educational Resources in #dariahTeach and the IGNITE Curriculum

#dariahTeach is a European-based platform for OERs in the digital arts and humanities developed by and for digital arts, humanities, and heritage. Its courses are aimed at educators for classroom use, students outside formal teaching structures (lone learners), and professionals wishing to "tech up." It is designed for hybrid (Meydanlioglu and Arikan 2014) or blended classroom teaching and learning, to be taken/delivered synchronously or asynchronously, both in formal classroom settings as well as in more informal settings (e.g., workshops and summer schools). #dariahTeach courses are divided into units, with further subdivision into lessons and pages (equivalent to book chapters, sections, and pages). This design allows for instructors to utilise the entire course or to assign only those units and sections that are relevant to their own course objectives and learning goals. A goal of #dariahTeach is to develop, as a collective, an ecosystem for a "networking" (Nørgård, Mor, and Bengtsen 2019) or hybrid university, a way of "doing" the university in a more open and collaborative way (Nørgaard, Schreibman, and Huang forthcoming), beyond the borders of any one institution and taking into consideration the interconnectedness of content developers, within an increasingly globalised world. Based on this cooperative and collaborative design, some one hundred educators, developers, and practitioners from around the world have been involved.

#dariahTeach has been developed over two successive phases, both funded by European Union grants. During the first phase (2013 to 2017), which was funded by Erasmus+, a European funding instrument that focuses on education, training, sport and youth, the Moodle-based platform and eight courses were developed. The second phase (2018 to 2021) was funded by a Creative Europe Media grant entitled "IGNITE: Design Thinking and Making in the Arts and Sciences." The goal of IGNITE was to extend #dariahTeach's audience into the creative and cultural sector (CCS) by creating new courses in design thinking and critical making, thus going beyond the provision of traditional academic competences and bridging knowledge, theories, and skills through a range of creative problem-solving techniques. A key design aspect of IGNITE was to meld design thinking methods with the ethos of maker culture through CCS case studies and

scenarios by creating software, tools, and methods informed by critical thinking, analysis, and reflection from the arts and humanities (IGNITE 2018). In such a way, acts of making possess intentionality: products embody, through the novelty or utilitarian nature of their design, the theory informing their making and have embedded within them—through the active reflection of the social and cultural environment in which they are made—the historical moment of their creation. This is what Ratto and Hokema call "critical making," a mode of material engagement that provides "cognitive resources for thinking" (2009, 52).

OERs on #dariahTeach have been developed by the partners of the aforementioned grants as well as by researchers and academics who were invited to contribute and others who developed material as part of their own courses, grants, or other educational activities (e.g., training schools). Contributions have taken many forms, including videos for the Introduction to Digital Humanities course, translations of existing content, and the development of courses of varying length, ranging from short courses (equivalent to workshops) to longer courses (equivalent to 5–10 credits in the European Credit Transfer and Accumulation System [2015]). All courses have received formal and/or informal feedback during the process of development to ensure consistency across the platform, in terms both of structure and of the use of multimodality and learning material that will allow for self-assessment and reflection.

As #dariahTeach is delivered through a technology-enhanced learning platform (Wang and Hannafin 2005), it practices what it preaches (or teaches), and has taken a user-centred approach to developing the content as well as the way that content is delivered (Burdick and Willis 2011; McKillgan et al. 2017). Courses are multimodal and include, in addition to text, images, timelines, and videos (some externally created content is embedded from streaming platforms, but the majority is created by #dariahTeach course developers). Since learning through the platform is designed to be asynchronous, courses have been designed to include frequent moments for self-testing of knowledge. This testing is done through a range of playful, media-enhanced "quizzes" delivered through the plugin H5P (2021). H5P is also used to develop other dynamic content, such as interactive videos and presentations. Critical and self-reflection are also supported by exercises attached to case studies and scenarios that deal with real-world problems or fictionalised accounts of situations set in realistic settings. In such a way, theory and practice inform each other and improve learners' analytical skills (Krain 2016; Nkhoma, Sriratanaviriyakul, and Le Quang 2017). Overall, courses take a praxis-based approach to learning by introducing topics with multimodal learning content, punctuated by self-testing via quizzes and reflections, and practice-based critical making through case studies and scenarios. Hence, #dariahTeach content is designed to be an exemplar in how to create online multimodal content (Breuer and Archer 2016, 6).

Embedding OERs from #dariahTeach in the curriculum for DT&M and CDC was an easy choice, and not only because two of the course instructors, Susan Schreibman and Costas Papadopoulos, have developed the #dariahTeach platform and some of the course content. First and foremost, the #dariahTeach content assigned was developed specifically for master's-level students, unlike other OERs (especially MOOCs), which often attract far broader demographics. Also, #dariahTeach courses are persistently available (i.e., they are not offered at a certain time over a given period), thus making it practical to assign material when it suits pedagogical goals and not when the platform offers the course. Lastly, courses have been consciously designed using multimodal resources as conveyors of meaning; unlike other video-based OERs, #dariahTeach includes an array of different modalities to engage learners.

The #dariahTeach courses Introduction to Design Thinking & Maker Culture and Remaking Material Culture in 3D (which were developed in the second phase of #dariahTeach as part of the IGNITE grant) were piloted in DT&M and CDC. A deliverable of the IGNITE grant included teaching the online courses at two European institutions (Maastricht and Aarhus Universities) at the master's level, as well as evaluating student satisfaction and engagement with the material, before making them available on the platform. The first iterations of these courses were developed during the 2019–20 academic year, allowing for two successive rounds of feedback as part of the project's iterative design cycle: the first round of feedback was gathered based on the pilots of the courses in 2019–20. This included feedback on the courses in #dariahTeach as well as the courses in the MADC (both the course itself and how the OERs were integrated). The second round of feedback was collected based on the completed courses in 2020–21. Given the iterative feedback loop built into the grant design, feedback was obtained not only from formal teaching but also from less formal workshops and summer and autumn schools that were organised and delivered by the IGNITE project team and based on pilots of the IGNITE curriculum. Feedback obtained orally or via online surveys was used to improve course design and content before public release in spring/summer 2020.

Curriculum Design

The MA in digital cultures (MADC) is a one-year program (as is common in the Netherlands) with courses (generally) taught in two-month terms: two in the autumn (terms one and two), with a one-month intense term in January (term three), followed by the final teaching period in February and March (term four). The

remainder of the academic year is devoted to thesis writing. DT&M was taught in the autumn (term two) as pandemic restrictions intensified, and CDC 1 and 2 were taught from January to March, wholly online. Both courses were designed from the outset to use #dariahTeach as a third pedagogic pillar, interacting with classroom learning (first pillar) and traditional secondary sources (second pillar).

Our teaching philosophy in these courses followed a three-tiered pedagogy: PBL and PjBL within a critical making approach. In a framework of critical making, as described by Ratto and Hockema (2009), materially engaged activities provide the means to bring to the fore the "socio-technical environment" of the object's making, providing students with a holistic environment to consider the needs of society, users, as well as the product or service being created (Ratto 2015, 40). Critical making extends the PjBL philosophy since the process is as important as the product and the act of making—physical or digital artefacts—can generate theoretical positions (Klein 2017) and interpretations (Staley 2017).

DT&M was thus designed to introduce students to the theories, methods, and principles of design thinking within the ethos of critical making. The course takes a design-derived perspective on challenge-oriented learning (Pérez-Sánchez et al. 2020), analysis, and problem solving through the lens of design ethnography, a method that combines traditional ethnographic approaches with user-centred design (Barab et al. 2004; Salvador, Bell, and Anderson 2010). Design ethnography was chosen to underpin praxis as it typically embodies a social justice, ethical, and responsible dimension to research practice, which is also a feature of many of the case studies in #dariahTeach's Introduction to Design Thinking and Maker Culture that were assigned as learning material for the course (see Appendix C: Design Thinking & Maker Culture Syllabus). A core objective of both #dariahTeach and our MA program is to provide students with models to generate creative ideas for deriving solutions to complex real-world problems, providing them with opportunities to construct (digital) artefacts that go beyond text-based linear arguments while introducing them to the more recently theorised space of critical making. For the academic year 2020–21, the critical making challenge was, in small teams, to create a group podcast on one of the course's central themes (design thinking, design ethnography, user-centred design, critical making, maker culture, the design lifecycle, multimodality) with accompanying individual but interlinked blog posts supporting, extending, and reflecting on the same topic (Figures 1 and 5). The blog posts also allowed us to give both group and

Figure 1: The process of designing the podcasts and accompanying blog posts for Design Thinking and Maker Culture took place in a hybrid learning environment. Student-identifying information has been redacted.

individual marks. Podcasts are hosted on the MADC's Soundcloud channel (Soundcloud 2020), and individual posts are hosted on the students' academic blogs, which are created in the first term of the programme.

CDC, on the other hand, is designed as a capstone course which brings together many of the skills and knowledge, theories, and methods taught in previous courses and new competencies to design a specific type of web presence, that of a digital collection. In creating the collection, students are invited to consider the ethical, methodological, theoretical, and practical issues regarding collecting and curation, representation, reconstruction, and reproduction. Like DT&M, CDC adopts PjBL, wherein students collaboratively work to develop a multimodal digital collection (see Appendix D: Creating Digital Collections Syllabus). In 2020–21, the design challenge was to plan and implement a digital collection which spoke to the students' experience of the COVID-19 pandemic through material culture generally and, more specifically, through an individual object modelled in 3D: "The Covid Collection: Coping with Quarantine" (MADC Class 2021a; MADC Class 2021b). Students were encouraged to choose objects which spoke both to their individual experience and to the wider social, cultural, and historical perspectives that their objects invoked. Working in small theme-based and design teams, all of which contributed to the larger collection, students utilised a variety of skills and competencies to complete the project, including project management, design thinking, content development, web design, video editing, and technical integration. The 3D objects, ranging from a pair of running shoes and a meditation pillow to a camera, a board game, and a paint brush, were contextualised thematically in five themes: (re)constructing reality, health, escapism, nostalgia, and documenting the period, with interactive elements inviting readers to actively participate in knowledge creation (e.g., a poll asking users about the objects they used the most to escape reality during quarantine). Moreover, students were asked to be conscious of the narratives they were creating, from the design and presentation of their chosen artefacts to the website's colours and the narratives that drew their disparate objects into themes. The process of moving from individual objects into wider socio-cultural meaning-making was carried out in workshops with the curators of a local museum (albeit on Zoom), Marres House for Contemporary Culture (Marres 2021). Students were conscious of how their collection would become part of a legacy of COVID-related collections created during the pandemic (Figures 2 and 6). Other collections include "Mementos: The

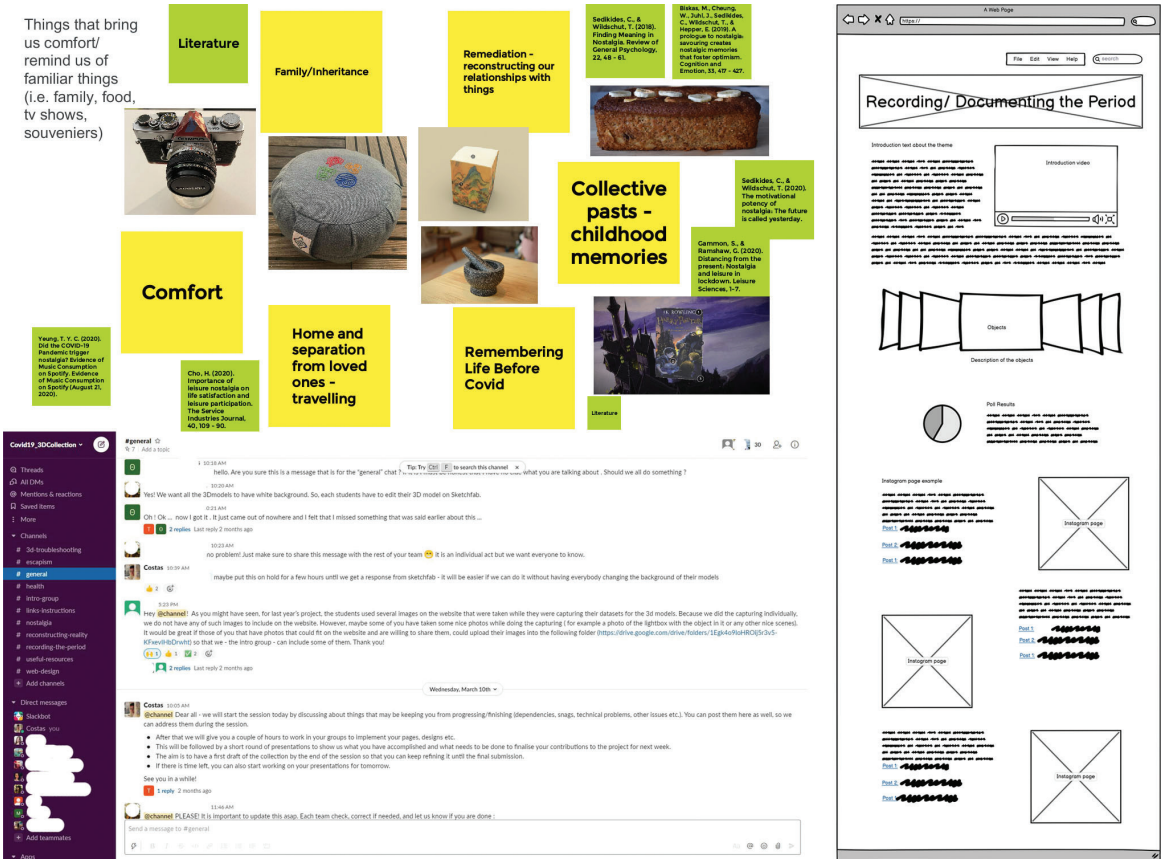

Figure 2: Jamboards, Wireframes, and Slack were some of the online collaborative tools used in the process of designing "The Covid Collection" for Creating Digital Collections 1 & 2. Student-identifying information has been redacted.

Things That Helped Us Survive 2020" (PBS Newshour 2020); "Corona in the City" (Amsterdam Museum n.d.); "#CollectingCOVID" (Museum of London n.d.); and "Collecting COVID-19" (Science Museum Group n.d.).

As mentioned previously, the two courses share common design principles (Table 1). Both utilise #dariahTeach as a core flipped classroom learning pillar, although each course integrates it differently. For DT&M, it was used as an alternative modality to teach theory supporting the students' own design/making projects (Figure 3), while with CDC it was used mainly to teach students the workflow for digitising objects in 3D, from capturing and processing to publishing them online (Figure 4). For both courses, we did not follow the respective #dariahTeach courses in their entirety but selected those sections that aligned with our learning objectives. Additionally, both courses centre on teamwork, collaboration, and co-production as part of a connected curriculum (Fung 2017a), which result in public-facing assessments. It is critical to the pedagogic goals of these courses (and to the underpinning philosophy of PjBL) that student work becomes public and is not simply work that the instructor marks and returns. Additionally, contrary to most of the courses in the MA that are prescribed with a coursebook that allows for little deviation, students in both courses take a good deal of control of their own learning, since we only provide the contours for their projects. Both critical making products are research based (Fung 2017b; van der Rijst 2017), with students designing and implementing the projects and the instructors acting as mentors. Lastly, as these courses are taught within a media studies degree that focuses on digital cultures, it is key that students realise that they are empowered to have their voices become a node in an ever-widening and contested new media landscape. In doing so, students become more aware of their responsibilities in communicating within a networked public sphere in which the private and the public increasingly meld into a public discourse (Young 2000, 170–72).

Student Feedback and Reflection

This section will reflect on students' feedback in relation to the use of the #dariahTeach for the two courses. To do this, it will draw from various sources: 1) students' responses to the formal evaluation questionnaires; 2) instructors' observations and informal discussions with students in feedback sessions

Table 1: Overview of the curricula of the courses Design Thinking and Maker Culture and Creating Digital Collections 1 & 2

	Design Thinking & Maker Culture	**Creating Digital Collections 1 & 2**
Theory/concepts	Multimodality; user-centred design; critical making;	Digital curation; digital materiality; authorised heritage discourse; new media; representation; reconstruction
Research methods	Design ethnography	Case studies
Skills	Audio editing; podcasting	3D modelling; curatorial writing; web design
Formative assessments	Blog posts; podcast; individual and group reflections	Quiz; blog posts; 3D models; group reflections
Summative assessments	SoundCloud podcasts and accompanying blog posts	"The Covid Collection"
Assigned #dariahTeach content (also see the supplementary course syllabi)	Course: Introduction to Design Thinking and Maker Culture (sections from Units I, II, III)	Course: Remaking Material Culture in 3D (sections from Units III, IV)
Type of OERs in #dariahTeach	Case studies; exercises; conceptual and theoretical readings; videos; quizzes (also see Figure 3)	Case studies; scenarios; exercises; conceptual and theoretical readings; videos; quizzes (also see Figure 4)
Mode of instruction	Hybrid	Online
Duration	7 weeks	10 weeks

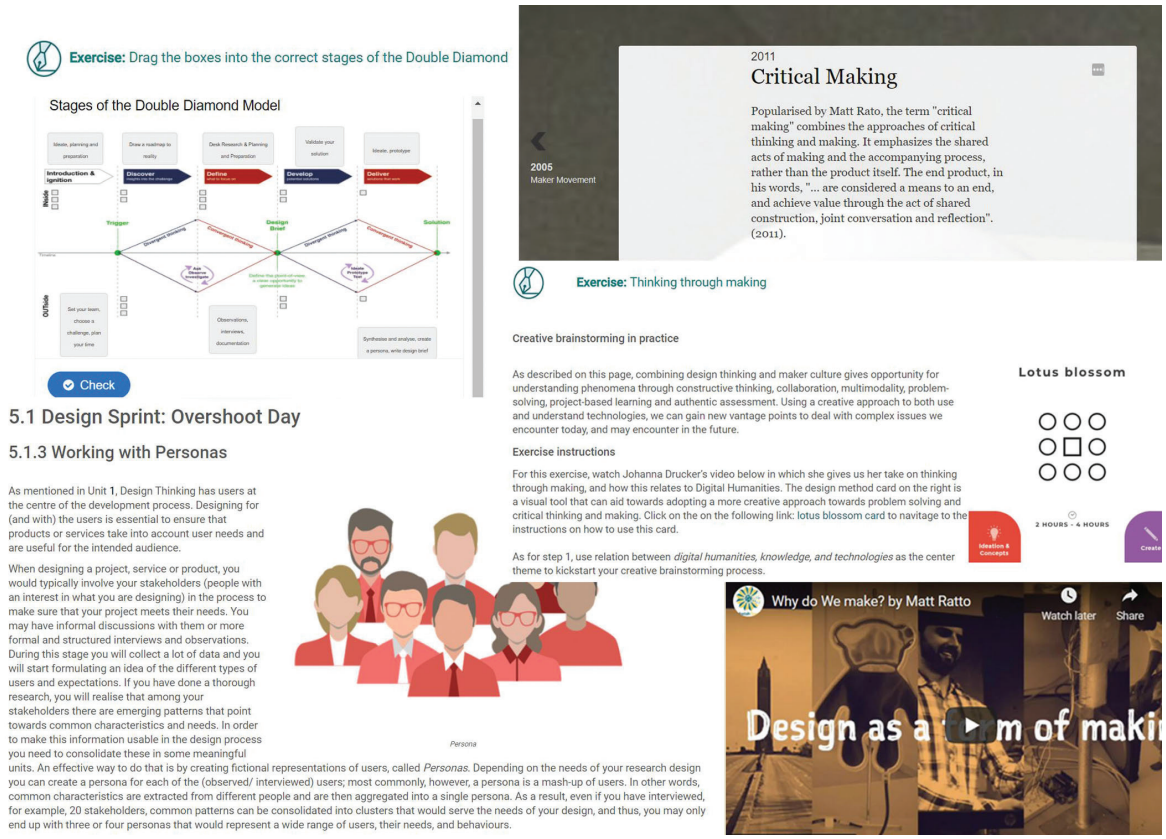

Figure 3: Examples of multimodal material on the #dariahTeach course Introduction to Design Thinking & Maker Culture, assigned to MADC students for the course Design Thinking and Maker Culture.

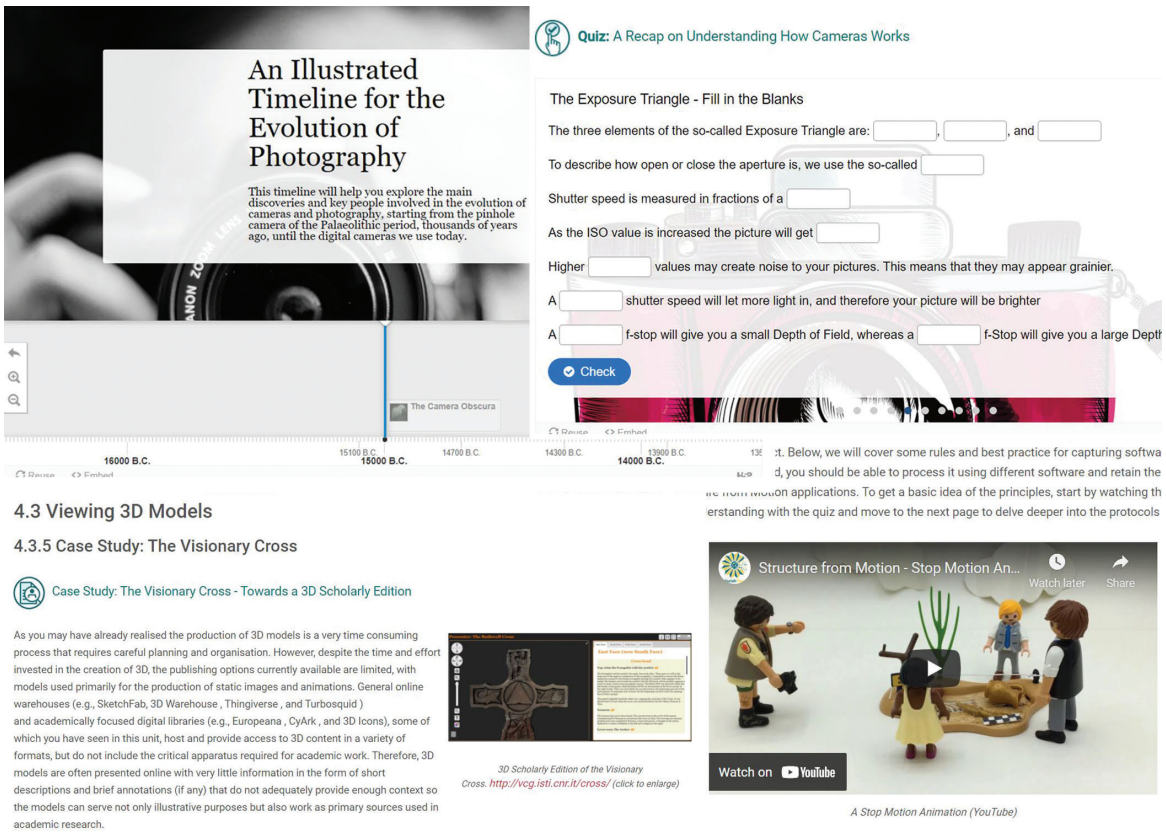

Figure 4: Examples of multimodal material on the #dariahTeach course Remaking Material Culture in 3D, assigned to MADC students for the course Creating Digital Collections 1 & 2.

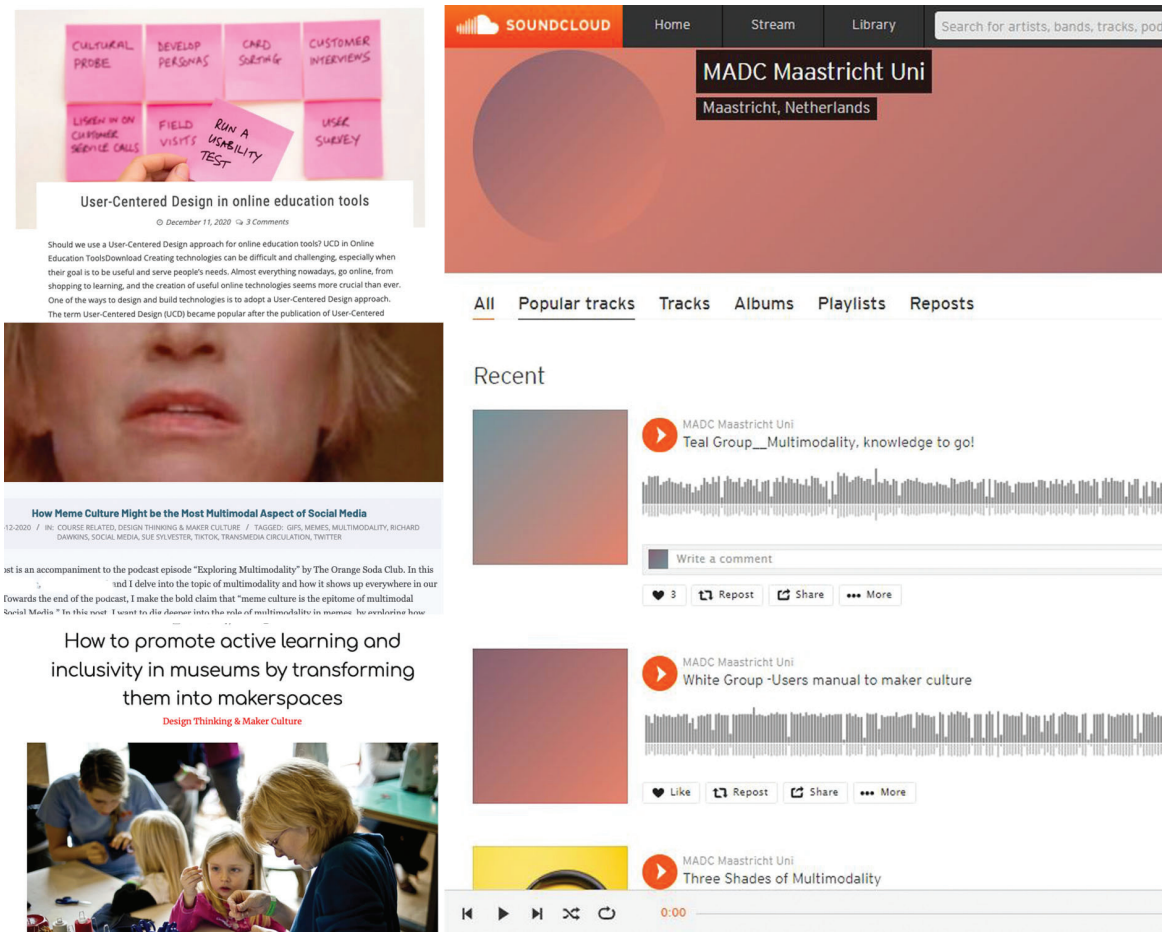

Figure 5: Blog posts and podcasts for Design Thinking and Maker Culture on SoundCloud. Student-identifying information has been redacted.

Figure 6: Homepage of "The Covid Collection" (Creating Digital Collections 1 & 2).

that were held at the end of each term; 3) a small-scale survey conducted for DT&M (fourteen responses; response rate 50 percent (see Appendix A: Online Survey: Design Thinking & Maker Culture); and 4) a focus group (FG) consisting of nine students for CDC (see Appendix B: Design Thinking Focus Group). It should be noted that the purpose of these evaluation mechanisms was to assess student satisfaction for the two courses during the academic year 2020–21. Since #dariahTeach was a core learning aspect of our courses, the questions that students were asked and our discussions with them also revolved around the use of the platform in their learning process. Since the sample is relatively small, the responses we got about #dariahTeach cannot be generalised for other OERs, and this is also beyond the scope of this article, which looks at how OERs from a particular platform (i.e., #dariahTeach) have been utilised in the classroom. A much wider study would be required to discuss OERs as a third pillar in MA education beyond our own institutional setting.

The student feedback and our reflections will be presented below under three main themes: a) multimodality, flexibility, and use; b) navigation and access; and c) transferable skills and competencies.

Multimodality, Flexibility, and Use

Students were overall very positive about the use of #dariahTeach as a third pillar in their learning. They particularly liked the multimodal and more playful and interactive elements of the online materials (e.g., quizzes, timelines, and stop-motion videos), not only because they provided a sought-after variety but also because they could check themselves and consult the resources until they were comfortable with the knowledge and skills obtained. They also thought that #dariahTeach provided an alternative but also simpler way to understand both the theory and the practice. A particularly positive aspect of the platform was the appropriate level of difficulty, thus demonstrating the benefit of utilising user-centred design in the creation process of #dariahTeach courses by actively involving MA students and iterating the learning content according to their feedback.

Of particular interest was a comment in the FG for CDC which highlighted that #dariahTeach provided another way to organise the students' studies: "I knew that I did not have much power to read articles, but I could do my dariahTeach study in the evening and in the morning do my articles. It organised my day literally." Other students also expressed that #dariahTeach helped them to balance their workload and facilitated the learning process, emphasising that "when you study in a more traditional way, you study for 3–4 hours and you get exhausted. In #dariahTeach 3–4 hours felt less exhausting, maybe because of the multimodal ways."

Despite the latter comment, students also pointed out that they would not expect to learn everything from #dariahTeach and that something more traditional (e.g., journal articles) should also accompany it. This was actually the case with both courses, since the assigned #dariahTeach material complemented more traditional resources such as scholarly articles (the second pillar). Especially in relation to the CDC course, students overwhelmingly highlighted that the assigned #dariahTeach content—which was more methodological and practice-based than theoretical—was particularly helpful for one of their formative assessments, a quiz, which tested their knowledge of the method they were going to use to 3D digitise their chosen objects. This focus on practical skills may also be the reason why a few students also mentioned that learning via #dariahTeach is more suitable for technical rather than theoretical content: "Dariahteach helped a lot, as many afternoons that I was trying to create a 3D model for you, video tutorials stood by my side, keeping me aware of plenty of details."

For DT&M, #dariahTeach content was used as an alternative modality to teach theory. Here, the main strength, apart from the more general multimodal and interactive learning experience, was the inclusion of videos created by the #dariahTeach team featuring practitioners around which the case studies and core concepts revolved. As one student commented in the survey, it was particularly helpful to "[get] to hear people in the respective field explain concepts in their own words."

Although students were overall very positive about the use of the #dariahTeach OERs as a third learning pillar, some of them were critical about the fact that some of the material assigned as a flipped classroom reading for CDC was also repeated or discussed in class: "a lot of the things felt familiar, especially if what we were required to read before class was then all (or a lot of it) repeated in class." It is indeed true that some of the material was repeated in class; however, this was a design decision because students did not have the opportunity to experiment with and try out the method in real time as was the case in the previous year. Therefore, there was indeed some repetition to ensure that students had a good grasp of the method before they had to apply it to their chosen objects, but class time was devoted to exercises and scenarios and not to the digitisation workflow and best practice covered in #dariahTeach.

Navigation and Access

Despite the highlighted benefits, students also commented on the potential inaccessibility of online resources. A few of them mentioned that they would copy and paste the learning material to a Word

document so that they could access it from anywhere and at any time, especially if their internet connections were unstable. The practice of exporting the content to a Word document, thus missing many of the dynamic and interactive elements of the platforms, was also mentioned in relation to the aforementioned quiz: "Maybe if we didn't have the exam, I wouldn't do this, but in our case it was really important to go back and take the information."

The #dariahTeach courses acted as a constant framework for students to go back to and did not interfere with or dictate their research projects. Students learned as they were designing and making, and the non-linear and multimodal structure of the courses facilitated such self-directed and iterative learning processes. In the case of DT&M, where the content was more focused on theory than in the CDC course, students also had to get used to the structure and design of #dariahTeach and the open-ended reading instructions. They commented that they found it difficult to assess if they "read" #dariahTeach in the right way—did I read enough; am I reading the right things; am I missing something? With a more traditional academic article, and in more directive PBL settings, students appear to experience the reading process as more linear, even if in these resources intertextuality is arguably also strong through the many references to other literature. Moreover, in the survey, students indicated that they did not always find that the further reading recommendations in the #dariahTeach units were useful. While this sentiment may be caused by the inclusion of recommended readings that students felt to be off topic, it may also stem from students getting used to navigating intertextuality in academic articles and multimodal online content more independently than in other courses.

Issues of navigation and finding content that was previously visited were also mentioned. In a love/breakup letter activity we run as part of the FG for CDC, one of the students wrote: "I would like to thank you for all the helpful videos and writing content you made available on DariahTeach. They were quite helpful. Nevertheless, please make it easier to move around the pages. I felt lost so many times on the website that in a determined moment I just had to keep the pages opened eternally on my PC to make sure I would not lose it." In the survey for DT&M, students also mentioned "the complicated structure of the content'" and that "the navigation in some cases was confusing; maybe the way subsections were divided into further subsections." While for some these may be design aspects that can be improved upon in #dariahTeach—and which we also plan on tackling in future iterations of #dariahTeach—the open learning environment also prompted students to actively engage with and reflect on the design and structure of their learning resources. In DT&M, for example, one group chose multimodality in education as their theme and used #dariahTeach as an ideal example.

Transferable Skills and Competencies

Overall, students appreciated the opportunities afforded by #dariahTeach and the skills they gained, emphasising their usefulness in both professional and personal development. For CDC, students mentioned that "it is the most useful and most interesting course of the whole MA." This was not only because of the COVID-related theme of the students' collection but also because they were "quite free to be creative . . . and create content in a variety of different mediums."

The majority of students also seemed to appreciate the fact that the projects had a similar structure to and required skills and competencies that they would need for their future work outside academia:

> "The projects were really interesting and possibly close to the structure of future projects in the workspace."
>
> "The course provides a lot of new valuable skills."
>
> "Learning to cooperate / communicate well / manage."
>
> "The end result and the group work are very much a valuable experience and skill to learn."

In DT&M, students emphasized that:

> "The practical, hands on and creative work was a highlight, as was the incorporation of 'soft' skills training like project management, which is important for professional development."
>
> "I feel that this is the kind of knowledge that can not only be used in real working environment but also rethink and change personal decision-making processes."

To most students, these ways of learning were new, and a positive surprise: "The hands-on approach, the making, the playful way of generating knowledge and the useful skills that were taught. I would never before imagine that I would have to make a podcast and an academic blog post as my final assignments. All of those things are the future of education."

Conclusion

During COVID, both teaching and learning have been more challenging than usual. However, under these extraordinary circumstances the pre-COVID design principles of Design Thinking & Maker Culture and Creating Digital Collections 1 & 2, and in particular the integration of what we called the *third pedagogic pillar*—the OERs in #dariahTeach—in PjBL, seemed to have worked particularly well. Based on student feedback and the instructors' own experiences, three elements of success have been identified and may be useful for other PjBL-based courses.

First, having so much collaborative work helped students out of their isolation; not wanting to let others on their teams down provided them with the motivation to keep going as the toll of successive lockdowns in Europe became more intense. Collectively designing, making, and finishing a project, and presenting a concrete public product, was fulfilling for both students and lecturers. Second, doing PjBL and critical making in a (mostly) online environment highlighted the core features of the OERs included in the #dariahTeach platform. The flexibility, multimodality, and interactivity of the resources were appreciated not only for facilitating and diversifying learning processes (and making them more fun!), but also for stimulating active engagement with the topics that were studied in the two courses. Third, and related to the previous points, the integration of OERs in what were essentially online critical making processes resembles how students create and navigate information and knowledge outside academia: online, multimodal, intertextual, and open-ended. By critically researching these features and processes in theory and practice, students acquire professional and (inter)personal skills that are essential for confidently living and working in as well as actively shaping our largely digital culture.

In conclusion, doing PjBL in emergency teaching formats worked out well. However, while we did not see any negative impact on the quality of group projects and the most important learning objectives, hybrid and online instruction did hamper the functioning of the courses in at least two ways. First, because students were given the option for the 2020–21 academic year to not attend in person, many students chose to stay in their home countries, and remote learning particularly disadvantaged students whose English language skills were weaker. These students missed the more casual interaction in which they used English on a daily basis, and they could not contribute equally to the more intense project and group work. In previous years, this intensive interaction was noticeable in improving students' English. Second, the hybrid form of teaching was evaluated negatively by students and lecturers alike. By January 2021, classes were held fully online. During the autumn it was clear that students, for the most part, were extremely keen to study in person, but with increasing cross-border restrictions (Maastricht is located at the southernmost tip of the Netherlands, near to the Belgian and German borders) many could not without breaking travel regulations, which were different for each country and were subject to change in response to the spread of the pandemic. Thus, one was never sure what the balance would be in any given class between students attending classes in person or opting to attend online. As a result of the hybrid format of instruction, students found it more difficult to focus and to interact with one another. This experience was exacerbated by the limited technical infrastructure available to facilitate hybrid instruction, which also made it difficult for the lecturers to cope with the constantly changing group dynamics.

This year's experiences with designing and teaching these two courses demonstrate that online, multimodal, and project-based ways of learning should be fundamental to how we teach in the physical classroom, rather than something added in the context of emergency remote teaching. If the aim of graduate programs is to teach students how to receive, process, create, evaluate, and present information and knowledge in a time when so much of that can be found online (regardless of COVID-19), we need to utilise a variety of learning modalities and materials. Moreover, students' experiences underscored the importance of diversity. Incorporating diversity in the use of learning materials within a single day, a week, a course, and the entire academic curriculum and acknowledging diversity in literacies among the student population—as well as changing needs throughout the life cycle of an academic programme—contributes to better learning and teaching.

Appendices

- Appendix A: Online Survey: Design Thinking & Maker Culture
- Appendix B: Design Thinking Focus Group
- Appendix C: Design Thinking & Maker Culture Syllabus
- Appendix D: Creating Digital Collections Syllabus

Competing Interests

The authors declare that they have no competing interests. The editors would like to note that Susan Schreibman is an editorial board member of *KULA* but that this submission went through the same submission process, including anonymous peer review, as all other submissions.

Statement of Ethics

The authors declare that although ethics approval was not sought for the inclusion of student feedback in this publication as it is not a requirement at Maastricht University, all students have provided their written consent that allows the authors to use the provided information and anonymised statements in research presentations and publications.

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