

# Conceptions of Time in Educational Technology: Considerations for Equity-focused Design

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## Abstract

The adoption of technology-enhanced online learning platforms is transforming teaching and learning practices within and outside the university. As online learning and educational technology become increasingly ubiquitous, there is a need for equity-minded scholarship attending to the social, cultural, and political implications of the technology sustaining online learning. While prior literature has made important strides framing education technology within conversations of equity and justice, there is a lack of empirical research analyzing marketing material of education technology. This presents a significant gap in understanding for education researchers, as marketing material plays a significant role in shaping public perceptions of technology, and can be widely read among students, instructors, and university stakeholders before directly engaging with the tool. Given recent scholarly interest in the ways subjective understandings of temporality are implicated in learning design, the present study connects burgeoning interest in temporality towards corporate marketing material of learning design. Drawing on artifact analysis methods, we analyzed blog posts from Coursera and customer success stories from Microsoft that describe how their products are designed to support online learning. Our research questions include: (1) How does marketing material from two education technology companies shape subjective understandings of temporality in online learning? (2) How can these temporal representations be leveraged to promote equity-oriented pedagogical design? Results from our analysis show how time is constituted as an efficient and agentic resource, and as an orientation towards future careers. We discuss how these findings have implications for equity-oriented pedagogical design by linking conceptions of time to neoliberalism and humanization.

*Keywords:* temporality, online learning, learning design

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The adoption of technology-enhanced online learning is transforming teaching and learning practices within and outside the university. This is particularly evident after the rapid transition to online learning precipitated by the COVID-19 pandemic, where students across the world made the transition to online courses (Cameron et al., 2021; Quintana et al., 2021). As online learning becomes increasingly ubiquitous, there is an increased need for equity-minded scholarship attending to the social, cultural, and political implications of the technology sustaining online learning.

Rising to meet this need, scholars from across the learning sciences, higher education, and online learning have worked from diverse perspectives and foundational literature to situate educational technologies within analyses of power and social equity. For instance, recent scholarship has linked neoliberal ideology in higher education to the proliferation of online proctoring technology (Fortman, 2023; Hébert 2021; McKenna, 2022), examined the relationship between the digital divide and online learning during COVID-19 (Kono & Taylor, 2021), and explored the experiences of refugee students learning online (Witthaus, 2023). By considering how the implementation and design of online learning technology is implicated in diverse social, political, and cultural frames, this growing body of research has showcased how an instrumentalist view of educational technology as “just tools” is insufficient, as it “ignores how our technological tools are manifest within social contexts, and that social agendas, assumptions and typical ways of knowing and acting are reflected in not just their use, but their very design” (Papendieck, 2018, p. 4). This critical trend in online learning can also be seen against a larger backdrop of critical digital scholarship, which has analyzed how systems of oppression manifest through biased algorithms and technology design (Benjamin, 2019; Noble, 2018).

While prior literature has made important strides in framing online learning within conversations of equity and justice, there is a lack of empirical research analyzing marketing material of online learning technology. This presents a significant gap in understanding for education researchers, as marketing material plays a significant role in shaping public perceptions of technology and can be widely read among students, instructors, and university stakeholders before directly engaging with a tool or platform. In this sense, we see corporate marketing material as an important pedagogical force structuring learners’ understandings even before they use the tool for learning academic content.

Given recent scholarly interest in the ways subjective understandings of temporality are implicated in learning design (Nguyen et al., 2022), the present study connects burgeoning interest in temporality towards corporate marketing material of online learning design. In particular, we draw on conceptual understandings of public pedagogy and platformization to analyze marketing material from two major educational technology corporations, specifically attending to the ways subjective understandings of time are marketed in the design of their online learning technologies. Drawing on artifact analysis methods (Trausan-Matu & Slotta, 2021), we analyzed blog posts from Coursera and customer success stories from Microsoft that describe product features. Our inclusion criteria identified six ( $n = 6$ ) Coursera blog posts and twenty-two ( $n = 22$ ) Microsoft customer success stories for analysis. Results from our analysis show how time is construed as a resource for increased efficiency and agency, and as a future orientation for learning. Our results further showed that corporate marketing material positioned universities as desiring efficient, job-oriented pedagogical designs. We discuss how these findings have

implications for equity-oriented pedagogical design by linking conceptions of time to neoliberalism and humanization. Our study is guided by two research questions:

- (1) How does marketing material from two education technology companies shape subjective understandings of temporality in online learning?
- (2) How can these temporal representations be leveraged to promote equity-oriented pedagogical design?

Interrogating the positionality of each researcher at the outset of the study was vital in conducting our investigation. To elucidate how characteristics of neoliberalism and proximity to the world of higher education might play a role in the way we conducted our study, each researcher reflected on their positionality relative to our guiding research questions. Holmes (2020) defines positionality as “an individual’s worldview and the position they adopt about a research task and its social and political context” (p. 1), noting that researchers can identify their positionality by explicating their relationship to their research topic, their participants, and their research design. Drawing on Jacobson and Mustafa’s (2019) social-identity-mapping framework, each author reflected upon the ways in which their positionality may inform their perspectives and interpretations.

Jacob Fortman is a white, cisgender male. He works as an Emerging Technology Research Analyst at a large public university where his responsibilities range from demonstrating new educational technologies to researching their design and implementation. Jacob regularly interfaces with a diverse range of educational technology vendors, which influences how he conceptualizes the relationship between for-profit educational corporations and public universities.

Rebecca Quintana is a white, cisgender middle-aged female. In her role at a leading university, she serves as a director of a 20-person online learning design team, co-director of a learning experience design program, and adjunct faculty member at the university’s school of education. She regularly presents research and keynote addresses on the topics of online learning design, equitable and inclusive design, and technology-enhanced learning environments. As director of online learning at the university’s provost-funded academic innovation center, she is deeply familiar with Coursera—its feature set and associated marketing materials. This background gives her an “inside perspective” on the topics of this paper.

Jacob Aguinaga is a white, cisgender male, first-generation Hispanic college student. He is pursuing a doctoral degree in education, specializing in the use of Massive Open Online Course (MOOC) platforms as an educational technology that enable social learning at scale. He attends a large, public research-one university in the United States where he also works as a learning experience designer, and where he collaborates with campus faculty to develop equitable and inclusive online learning experiences. As a student in higher education at a leading university, the values of neoliberalism are ever-present. However, so too are the values of diversity, equity, inclusion, and justice, which are initiatives embraced on campus and in the classroom. As a learning experience designer, Jacob frequently interacts with Coursera and is familiar with the blog posts as well as their current feature set. This experience with Coursera provides additional context other researchers might not be privy to.

## Literature Review

### *Platformization as Public Pedagogy*

To elucidate the ways in which corporate marketing material shapes subjective understandings of temporality in online learning design, we draw on two conceptual frameworks to frame our thinking: Public pedagogy and platformization. By synthesizing across these two concepts, we intend to show how narratives invented through the “ed-tech imaginary” (Watters, 2020) and instantiated through technology platforms constitute a form of public pedagogy structuring collective understandings of temporality and learning design.

Drawing on Giroux (2004), we conceptualize public pedagogy as the diverse ways in which cultural practices function pedagogically to produce, distribute, and regulate power. In this way, pedagogy is not limited to classroom interactions, as learning occurs across a broad range of social contexts, including new media, communities, and familial relations. Furthermore, pedagogy cannot be understood as politically neutral, as processes for learning are implicated within individuals’ political identity formation, moral valuing, and historical consciousness. Taken together, we liken public pedagogy to a form of “constant education” whereby individuals are always embedded within social structures and institutions that act pedagogically to shape subjectivities.

The platformization of education is one example of a public pedagogy structuring collective understandings of “ideal” teaching and learning practices. Following Decuyper et al. (2021), we view platforms “not as neutral ‘digital tools,’ but on the contrary as connective artefacts constitutive of, as well as constituted by, active socio-technical assemblages that are in the process of significantly transforming the educational sector” (p. 2). Accordingly, as institutions of higher education adopt new digital learning platforms, they must negotiate the assumptions, biases, and ideological forces that are carried through that platform. By affording some pedagogical interactions and foreclosing others, educational platforms silently condition instructors and students towards norms of teaching and learning. When instructors and students work outside the limitations of a given platform, they must invent workaround procedures, or acquiesce to the conditions set by their platform (Quintana & Tan, 2019). In this way, platforms function pedagogically by guiding instructors and students towards particular ways of knowing, doing, and being. Considerations of politics, power, and ideology come into play more explicitly when we consider who is construing the idealized model of teaching and learning, and how this model privileges or constrains certain identities, ideas, and interactions within the learning environment.

We see the notion of platformization as public pedagogy resonating throughout previous educational scholarship. Fortman (2023) critiques the proliferation of online proctoring platforms by framing it within the larger neoliberalization of the university. By relying on invasive video recording and facial detection technologies, online proctoring technologies normalize harmful teaching practices that are founded on neoliberal values of atomization, precarity, and competition. Massive Open Online Course (MOOCs) platforms have also been the subject of critique, as various scholars have connected the platforms to projects of neocolonialism (Adam, 2019; Altbach, 2014). In one illustrative example, Reilly et al. (2016) showcase how automated essay scoring in MOOCs can disadvantage non-native English speakers. While previous

scholarship has provided helpful critiques and theoretical language to frame future thinking, there is a lack of empirical scholarship taking up such critical perspectives.

### ***Perspectives on Time***

While scholars have increasingly turned a critical eye towards online learning platforms and the technologies sustaining them, another emerging research strand has settled around subjective understandings of temporality and the way conceptions of time are implicated within learning design and education more broadly. By troubling the notion that time can only be known as a static, objective measure, this temporal turn in educational thought has argued that subjective understandings of time can structure learning in significant ways. Shahjahan (2014) captures this sentiment: “Even as it silently structures our everyday lives, time is not given or natural; rather, its meanings and forms shift historically and are culturally specific” (p. 490).

Within the learning sciences, we see the interest in time manifest in Nguyen et al. (2022), which covers diverse research focused on subjective and culturally situated understandings of space, time, and equitable learning design. Topics from this learning sciences symposium include analyzing chronotypes (Bakhtin, 1981) in crisis and innovation narratives from ed-tech innovators, designing to equitably support learners’ identity trajectories, and the role of space-time dimensions in the design of extended reality learning experiences, among other topics. Further evidence of the learning sciences recent focus on temporality can be found in Uttamchandani (2021), who draws on conceptions of prolepsis (Cole, 1996) and prefiguration (Curnow, 2016) to describe how anticipated future activity shapes present activity in socially and politically meaningful ways.

Outside the learning sciences, scholars of higher education have also fruitfully theorized the subjective nature of time by highlighting how the concept can undergird neoliberal logics of academic capitalism (Walker, 2009) and colonialism (Shahjahan, 2014). For instance, Shahjahan (2014) has argued that the historical evolution of time measured biotically or naturally (e.g., passing days, weather cycles) to a linear conception of clock time has contributed to notions of linear student development, punctuality, and a disconnect between our bodies and nature.

## **Methods**

Our study draws on artifact analysis methods (Trausan-Matu & Slotta, 2021) to examine Coursera blog posts and Microsoft customer success stories describing education technology product designs. Following Saldaña (2009), a single coder used provisional codes centered on time to elicit preliminary insights from the data, and subsequently developed additional codes to elaborate on these constructs. In the first round of coding, one coder open-coded the data set for language that invoked conceptions of time. While we were particularly attuned to explicit mentions of “time,” we were also attuned to the ways time was invoked more implicitly. For instance, notions of “rate,” “rapidity,” and “efficiency” expressed how much time it took to accomplish a task. In this way, we started to conceive of time as a benchmark for establishing the pace of work, and less time on task equated to greater efficiency. Informed by previous research on prefiguration and prolepsis, in which future goals shape present actions (Uttamchandani, 2021), we also considered how conceptions of the future implicated designs in the present.

After the initial round of coding, we worked within smaller sets of coded data to locate examples where time was linked to the design of online learning (e.g., the product allowed students to instantaneously receive feedback from anywhere). These examples were collected on a shared Miro Board, a collaborative digital tool featuring sticky notes and grouping abilities. Within the shared Miro Board, we iteratively generated themes relating discourse examples. Smaller themes were merged into larger themes until we arrived at a broad set of themes to characterize the range of ways time was implicated within the design of online learning technologies.

## Data

Data for this study consisted of publicly available marketing material from Coursera and Microsoft websites published between 2020 and 2023. We chose to analyze Coursera and Microsoft because they represent two of the largest education technology companies in the world, and their respective products are distinct. While Microsoft offers a wide range of hardware and software to support online learning, Coursera centers more specifically on MOOC and online learning platforms, which enrolls millions of learners on its platforms (Shah, 2019). Furthermore, to diversify our data set, we intended to locate marketing material written for different purposes. While Microsoft's customer success stories featured descriptions of how their products are being used within higher education institutions, Coursera's blog posts were written as updates and announcements for new online learning platforms and features. By representing different marketing material, technology products, and corporations in our data set, we sought to provide a rich set of perspectives on the ways technology design for online learning implicates time in meaningful ways.

Coursera is the largest MOOC platform in the world, boasting 118 million learners enrolled across over ten thousand courses offered by over 300 higher learning institutions (Shah et al., 2023). It is one of the many global MOOC platforms, with there also being MOOC platforms specific to individual countries. Contemporary MOOC designs center pedagogies that enable individualistic learning experiences. These designs generally feature "a set of short, modularized video-lectures, followed by automated, multiple-choice testing of learners' understanding of the content" (Margaryan et al., 2015, p. 77). As an attempt to adapt to the changing demands of an audience of global learners, MOOC platforms like Coursera must continually develop new features and capabilities which then must be advertised to institutions for adoption, marking a vitally important step in the marketing and sustainability of the platforms.

Microsoft's technology offerings span a broad range of educational, professional, and general consumer offerings. To support online learning, Microsoft offers their popular communication platform: Microsoft Teams, their cloud computing platform: Azure, their combination laptop and tablets: the Microsoft Surface, their suite of productivity software: Office 365, their pre-made online curriculum: Microsoft Learn for Educators, their virtual whiteboard application: Whiteboard, and Career Coach, an application that integrates with Teams to provide students with professional advice. Collectively, these offerings represent a diverse range of online learning engagement, from written (a)synchronous communication to real-time digital inking.

To ensure we analyzed marketing material that was directly related to conceptions of time and learning design, we excluded articles that did not describe technology used in online teaching and learning contexts, and we further excluded articles that did not provide descriptive details of technology design. This brought the included Coursera articles from twelve (n = 12) to six (n = 6) and the included Microsoft articles from fifty-five (n=55) to twenty two (n = 22). While the Coursera articles focus on their MOOC platform (n = 2), CourseMatch (n = 2), Career Academy (n = 1), Career Learning Paths (n = 1), Live2Coursera (n = 1), the Microsoft articles feature a diverse range of online learning platforms and educational technology products, including Microsoft Teams (n = 13), Azure (n = 12), Surface (n = 9), Office 365 (n = 4), Microsoft Whiteboard (n = 2), Microsoft Learn for Educators (n = 1), and Career Coach (n = 1). The complete catalog of articles included in this study can be found in Appendix A.

## Findings

Findings from our qualitative analysis of Microsoft customer success stories and Coursera blog posts show how various understandings of time played a role in structuring how, why, and when learning happens. We grouped these understandings into two large themes: Time as a resource and time as a future orientation. We further characterize two subthemes within the time as a resource theme. A description of each theme and subtheme is represented in Table 1.

**Table 1**

*Themes Present in Microsoft Customer Success Stories and Coursera Blog Post*

Theme	Description	Quote
Theme 1: Time as a Resource	Time is a resource that can be used to benchmark the rate at which learning occurs and the relationship learners have with educational material.	<i>“By providing remote learning opportunities, Staffordshire University could also help its instructors, who are practicing clinicians, spend less time commuting and setting up simulations and more time with their patients” (Microsoft, 2022f).</i>
Subtheme 1.1: Time as a Resource for Efficiency	Time is a resource that should be used optimally so that learners can progress through an educational experience in an efficient manner. Accordingly, technology designs facilitated pedagogical interactions in ways that were automatic, instantaneous, and real-time. Marketing material also conveyed that efficiency was a desire of university consumers.	<i>“Learners can input their schedules into a course to automatically receive personalized course deadlines and goals to stay on track” (Goli, 2022).</i>

<p>Subtheme 1.2: Time as an Agentic Resource</p>	<p>Time is a resource that grants students and instructors increased autonomy to work how, when, and where they would like. Accordingly, technology designs facilitate pedagogical interactions where the use of time is unstructured.</p>	<p><i>“Every student automatically getting a Windows license and access to Office 365 across all their devices creates a level playing field so that students can use it where, when, and how they want.”</i> (Microsoft, 2022e).</p>
<p>Theme 2: Time as a Future Orientation</p>	<p>The goals for education and learning are primarily determined to be graduation and employment. Accordingly, the design of technology centered on skills that would easily translate to the job market. Marketing material also conveyed that these educational goals were expressed by university consumers.</p>	<p><i>“The Microsoft Learn for Educators program enables faculty members to infuse Microsoft curriculum, hands-on labs, and tools into the courses they already teach, better preparing their students for Microsoft certification and successful job hunts”</i> (Microsoft, 2022a).</p>

### ***Time as a resource for efficiency***

Throughout the Microsoft and Coursera marketing materials, time was positioned as a resource that should be used efficiently. To facilitate the optimal use of time, marketing materials prioritized speed and efficiency through delivering information automatically, instantaneously, and in real-time. This automatic, instantaneous, and real-time information could serve a variety of pedagogical purposes. For instance, one Microsoft customer success story describes the benefits of using automated notifications in Microsoft Teams to help students stay up to date with their work: “Students change their learning behaviors with Teams together mode, learn from each other directly in breakout rooms, and use organized structures with automated notifications to stay on top of their assignments” (Microsoft, 2022c). A similar feature was also detailed in the Coursera platform, where “Learners can input their schedules into a course to automatically receive personalized course deadlines and goals to stay on track” (Goli, 2022).

While automatic notifications for keeping students organized and on track were common throughout Coursera and Microsoft’s marketing materials, they also drew on themes of speed and efficiency for other pedagogical purposes. In another description of Microsoft Teams, marketing materials describe how the Career Coach app provides students with just-in-time advice from peers and mentors: “Because Career Coach is built into Microsoft Teams, students get just-in-time advice from peers and mentors as they reach key milestones in their career journey” (Microsoft, 2022b). In a post from Coursera, they describe using machine learning (ML) to create lecture reviews that are quicker for learners to go through: “ML-generated summaries of key lecture videos provide learners with an easy way to review prior course material, gain a quick understanding of a topic, and progress faster through a course” (Goli, 2022). In this instance, the time it takes to watch a video has been compressed into on-demand, automatically generated summaries.

While Microsoft and Coursera products were routinely positioned as making learning an efficient process, Microsoft's marketing material also explained that their products could allow other company's products to be increasingly quick and responsive. In one customer success story, Microsoft describes how their cloud computing platform, Azure, allowed a university to launch a new digital simulation platform that reacts in real-time: "CAE Maestro Evolve simulates a diverse range of clinical experiences with a digital patient, and learners practice performing essential medical procedures such as taking a pulse and performing defibrillation while the digital patient reacts in real time with relevant symptoms" (Microsoft, 2022f). As this anecdote highlights, when Microsoft's products aren't directly providing learners with instant information, they are the engine driving other products to do so.

Unlike Microsoft, Coursera did not explicitly market their products as increasing the efficiency of other products. However, they did describe a variety of integration features with other companies, which allowed for increased educational efficiency. For example, they explain how Turnitin, a plagiarism detection software, allows instructors to grade at scale: "Educators can leverage industry-standard tools to grade at scale, including Gradescope and Turnitin, with WISEflow coming later this year" (Goli, 2021). In this instance, increasing the efficiency of grading and plagiarism detection practices becomes a key component for increasing the amount of learners Coursera can educate.

Finally, to show that customers *want* learning experiences where time is used efficiently, Microsoft's customer success stories describe how instructors and students desired these goals. In this way, Microsoft is meeting rather than inventing a need. In an example from Staffordshire University, Microsoft describes how the move to remote learning allowed instructors who are practicing clinicians to spend less time on classroom logistics and more time with their patients: "By providing remote learning opportunities, Staffordshire University could also help its instructors, who are practicing clinicians, spend less time commuting and setting up simulations and more time with their patients" (Microsoft, 2022f). In another example from DeGroote School of Business at McMaster University, a customer success story describes how a team of faculty and Microsoft staff sought to design a highly efficient sequence of courses: "The joint team aimed to design a highly efficient, effective sequence of classes to deliver the most targeted, leading-edge content" (Microsoft, 2022d). Coursera took a similar tact marketing its platform, in one example they write: "Knowing that educators are often strapped for time, we focused on streamlining the authoring experience with features that aim to make content creation and management more efficient" (Goli, 2022). By positioning efficiency and productivity as authentic desires of their customer, the technology appears as a manifestation of authentic needs rather than an invention of corporate marketing.

### ***Time as an agentic resource***

While time was often figured as a productive resource driving educational efficiency, it was also positioned as a resource to foster agency among instructors and students. In this characterization of time, having the ability to choose how you spent it empowered instructors and students to work when and where they would like. For instance, while quoting a Director of Learning Technologies, one customer success story notes that Office 365 creates a "level playing field" for students:

“I saw one student writing a research paper using just a keyboard and his phone. Every student automatically getting a Windows license and access to Office 365 across all their devices creates a level playing field so that students can use it where, when, and how they want.” Additionally, students can access Office apps entirely in-browser, ensuring that no matter a student’s access environment, they can still complete assignments and collaborate with others. (Microsoft, 2022e)

For Microsoft, increased agency was also granted through asynchronous learning opportunities, allowing learners to study in ways that work for them. In one description of using live classroom recordings, Microsoft notes that this asynchronous activity can better accommodate students in multiple time zones:

During the live class, the teacher leads remote and in-person students together to discuss key concepts, use Microsoft Whiteboard to brainstorm, and join polls and breakout rooms to work on group exercises. Afterward, students can review class recordings and continuously exchange thoughts at any time, no matter which time zones they’re in. (Microsoft, 2022c)

Coursera similarly emphasized the value of granting learners independent, asynchronous work time. In describing a file download procedure that lets learners work from anywhere they prefer, they write that “With just a few clicks, learners can easily download files from Labs to work locally in their preferred development environment or to preserve their work” (Goli, 2022).

### ***Time as a future orientation***

While Microsoft and Coursera emphasized using time efficiently, this sense of efficient learning tended to orient students towards two future goals: graduation and employment. In this way, time is not only a resource to use efficiently, but it also sets the terms for measuring success. This sense that learning should be an efficient means of career preparation is captured in Coursera’s announcement for “Career Academy,” an online platform for upskilling and reskilling learners for new jobs: “Today we announced Career Academy to help enterprises give individuals—even those with no college degree or prior work experience—the opportunity to learn the skills to enter a high-demand, entry-level digital job.” As part of the features within the Career Academy, Coursera made available a library of short videos and lessons to address “in-the-moment learning needs,” and described their “42 SkillSets” to “drive productivity, adapt, and innovate in a rapidly changing world” (Goli, 2022).

As Coursera and Microsoft marketing material oriented learners towards their future employment, the stories concurrently emphasized the value of practical “hands-on” skills that prepared students for authentic work. In describing the Microsoft Learn for Educators program, the company writes: “The Microsoft Learn for Educators program enables faculty members to infuse Microsoft curriculum, hands-on labs, and tools into the courses they already teach, better preparing their students for Microsoft certification and successful job hunts” (Microsoft, 2022a). This sentiment for practical, job-oriented training is also seen in the decision to adopt Office 365 at the University of Texas at San Antonio:

Giving students professional workplace skills was another leading factor in UTSA's decision to move to Office 365. "Students can either learn the tools now or on the first day on the job, and the latter puts them at a disadvantage," said Dr. Abel Wilkinson. "Bringing students into this platform boosts their professional development. The work they're doing in academia does double duty because it's also teaching them how to collaborate in a professional context." (Microsoft, 2022e)

Microsoft customer success stories were also clear that the desire for practical job training skills was not a corporate invention—these were authentic needs from their university customers. For instance, in describing the need for a digital manikin simulation platform powered by Azure, one Microsoft post takes the perspective of university administration: "University administrators wanted to give students access to highly valuable, hands-on training opportunities from any internet-enabled location and allow them to practice independently without needing access to a physical manikin" (Microsoft, 2022f). Coursera similarly notes that what educators need is efficient, hands-on learning: "As more educators move online, they need to be able to author content efficiently and effectively, offer hands-on learning experiences, manage grades and program operations at scale, and monitor student or content performance at any time" (Goli, 2021).

## Discussion

Findings from our qualitative analysis of marketing material from Microsoft and Coursera showcase how two major education technologies shape subjective understandings of temporality through their marketing material. These subjective understandings of temporality have important implications for equity-oriented learning design. By positioning time as a resource to be used efficiently, both Coursera and Microsoft designed features that allowed learners to progress through their courses quickly. This was evident in the instantaneous, automatic, and real-time information delivery features intended to keep students on track, and it was further emphasized in Coursera's description of using machine learning to create lecture reviews. While time structured the rapidity of student learning, it also oriented their learning by setting graduation and employment as the end goals for education. This future orientation impacted present learning by tailoring the curriculum towards practical skills that transferred into the job market. Finally, time also became a source for student agency, as some designs purposefully granted students leeway on when they could do their work. Such was the case with adopting Office 365, which allowed students to learn "where, when, and how they want."

These conceptions of time are not without certain tensions, particularly as it entails equity-oriented learning design. One tension arises when we consider how an overemphasis on efficiency can limit pedagogical scaffolding. For instance, a medical simulation that only provides instantaneous reactions eliminates the opportunity to reflect, hypothesize, and discuss what reactions *might* occur before those reactions are shown on a simulation. Or, when advice from peers and mentors are synched to automatically be delivered based on certain milestones, students lose the opportunity to seek out that information themselves. In this way, efficiency in technology design can foreclose opportunities for reflection, collaboration, and agentic exploration.

The future orientation marketed by these corporate technology companies also suggests a tension regarding the role of higher education. While Coursera and Microsoft position graduation and employment as the future orientation for learning, overemphasizing such careerist narratives erases notions of education serving a larger public good where marginalized learners are humanized, systems of oppression are critiqued, and the breadth of human understanding is expanded for the collective benefit. In this way, marketing material of educational technology aligns with the broader neoliberalization of higher education, where the mission of learning is largely defined through free-market interests (Busch, 2017). Bylsma (2015) captures this sentiment:

The telos of higher education has been colonized by a neoliberal ideology and the teleological implications that follow, shifting the ultimate direction of higher education from its social, communal, and democratic ideals toward a vision of success rooted in individual achievement and determined by material gains. (p. 6)

While narratives of efficiency and job preparation in education technology marketing broadly align the neoliberalization of higher education, we see an opportunity to promote alternative narratives of learning and higher education by attending more deliberately to notions of agency. While marketing material explained that university instructors and staff desired efficient learning experiences to prepare learners for a changing global job market, it is less clear what ends agentic learning leads to, and where these desires for agency are born from. In other words, while efficiency appears as a means towards a desired end, agency appears as an undesired end in itself. In a critical interpretation of this finding, one could argue that an emphasis on learner agency reaffirms a neoliberal education model where learners are construed as atomized, self-interested individuals competing against their peers. However, this interpretation could be hasty, as empowering learners through agency can also represent an important move towards a humanizing, praxis-oriented pedagogy. Such perspectives resonate with Freireian critical pedagogy, particularly in its critique of the passive banking model of education and in its advocacy for problem-posing education (Freire, 2020). To promote a vision of education serving a larger social good, we argue that education technology companies should connect agency in learning design to a humanizing pedagogy where learners are dignified and empowered to solve problems of personal and public importance. Such narratives extend beyond myopic notions of agentic learning only promoting convenience, and reaffirms learning as an ethical, communal, and humanistic act.

## **Future Directions**

Our analysis of how educational technology companies shape subjective understandings of temporality foregrounds important future directions for scholarship of online learning. In one direction, we see an opportunity for scholars to continue taking up the task of empirically studying how learning design is marketed by corporate entities. While our present study focuses specifically on the marketing of temporality by two major education technology companies, other pedagogical concepts would likely benefit from further research. For instance, Fortman and Quintana (2023) point towards research that explores how marketing strategies can shape learners' understandings of collaborative and embodied learning in virtual reality.

In another direction, we see an opportunity for scholars to empirically study how instructors and students make sense of online learning marketing material within their specific learning contexts. While we argue that the platformization of education serves as a form of public pedagogy conditioning educators and students towards norms of teaching and learning, we do not think this is the whole story. We see opportunities for nuancing how marketing material of online learning translates into specific implementations and designs in the classroom. For instance, it is not clear how instructors and students might consciously work against the narratives marketed towards them.

Given the popularization of online learning technologies, we see a tremendous potential for future scholarship to empirically analyze online learning marketing material and subjective understandings of time. While this study offers insights on the ways time is constructed both as a resource and as a future orientation, future scholars would be well served by further interrogating time as a social construction, and the pedagogical influence of marketing material for online learning.

### **Declarations**

The authors declare that there is no conflict of interest.

The authors declare that this work was exempt from review from an IRB/Ethics board.

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## Appendix A

### Data Sources

<b>Coursera Product Updates</b>	
Title	Date Published
Unleashing the next chapter of personalized and interactive online learning with generative AI, machine learning, and virtual reality	April 13, 2023
New products, tools, and features to enhance teaching and learning on Coursera	May 4, 2022
Announcing new products, tools, and features to support learners, educators, and institutions with their rapidly evolving teaching and learning needs	April 19, 2021
Introducing Career Learning Paths: Learn the skills to advance your career with confidence	August 28, 2020
Introducing New Tools and Features as Demand for Online Learning Grows	April 21, 2020
Coursera launches CourseMatch: A machine learning solution that automatically matches a University's on-campus courses to courses on Coursera	April 15, 2020
<b>Microsoft Customer Success Stories</b>	
Title	Date Published
University of North Carolina Greensboro migrates to Microsoft Azure to elevate student and community experiences	August 8, 2022
CAE, Staffordshire University extend virtual patient simulations, drive better healthcare education with Azure	July 13, 2022
Tulsa Tech enables a truly hybrid learning environment with Microsoft Teams Rooms	June 30, 2022
Pearson VUE aces data safety with Microsoft Sentinel across a multicloud and hybrid environment	June 6, 2022
The University of Texas at San Antonio Increases Collaboration and Strengthens Cybersecurity with Microsoft 365	May 17, 2022
McMaster University's DeGroote School of Business collaborates with Microsoft to design advanced digital literacy curriculum	May 2, 2022
Florida university gives students hands-on skills, job-hunting success with Microsoft courseware	April 28, 2022

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USC’s Viterbi iPodia Program invests in collaborative hybrid learning to break down barriers in traditional education with Microsoft Teams	March 23, 2022
Career planning for the modern workforce—How University College Cork used Career Coach to transform the student experience	March 16, 2022
Kent State University offers hybrid learning for remote and in-room students with Microsoft Teams	February 1, 2022
NSU engages students with AI-enabled chatbot using Microsoft Azure	September 21, 2021
Clemson University and Microsoft partner to pilot Surface and Teams to enhance student success and promote community-based engagement	September 10, 2021
Jacksonville University creates a data-driven culture with Power BI	August 5, 2021
How Microsoft and Anthology empowered Coppin State University’s student engagement through digital transformation	July 7, 2021
Michigan student gains life-changing opportunities after earning multiple Microsoft certifications while still in high school	June 25, 2021
University athletes score academic wins with Microsoft Surface and cloud technology	June 25, 2021
From No. 2 pencils to the cloud, Territorium transforms testing, helping universities open doors for students	June 14, 2021
University of North Carolina at Charlotte uses Azure PaaS to bootstrap an EV charging solution	May 21, 2021
The Crimson Tide roll on Office 365: How the University of Alabama brought “The Capstone” together using Microsoft solutions	May 11, 2021
Indiana University aces remote learning with virtual exam solution in Microsoft Teams	February 25, 2021
Taking medical instruction remote and to mixed reality at Case Western	December 2, 2020
Working as a team amidst disruption at the University of South Florida	April 20, 2020

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