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An Analysis of Factors Affecting E-Learning and Blended Learning: Impacts on Learning Outcomes, Student Satisfaction, and Engagement

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Abstract: *E-learning is becoming more and more prevalent in higher education, particularly in blended learning, which is a new type of conventional teaching and learning that may be implemented in a variety of methods. In an attempt to determine which learning format yields the best results, such as the greatest learning outcome, the most pleased students, or the highest course completion rate, several studies have contrasted in-person instruction with online and/or blended learning. These studies, however, often demonstrate that the teaching style is not the only factor that affects instruction and learning. Numerous aspects are important, and some of them will be further examined in this review of the literature. The study focuses on variables that affect learning experiences in blended learning, online learning, and e-learning, with a particular emphasis in professional bachelor's degree programs and teacher preparation. Consequently, the following is the research question for the review: Which variables are discovered to affect student happiness, learning outcomes, and collaborative engagement in higher education, especially in professional education, when it comes to e-learning and blended learning? The results of the research papers that were part of the review indicate that while there are many factors at play, a few stand out as being more important than others. These factors include the presence of educators in online settings, interactions between students, teachers, and content, and the creation of connections between offline and online activities as well as between activities related to the campus and practice. While the essay does point to certain important elements, it also addresses and calls into question the validity of studies that compare different forms of e-learning, online learning, blended learning, or "traditional" face-to-face teaching and learning. The teaching style is not the only factor that affects teaching and learning; both are intricate processes. 44 peer-reviewed publications and papers published between 2014 and 2017 are included in the study, which is based on methodical database searches carried out in January 2017..*

Keywords: E-learning, virtual learning, hybrid learning, student happiness

I. INTRODUCTION

Numerous research in the reviewed literature have attempted to ascertain if conventional face-to-face teaching methods are inferior to computer-mediated education in terms of learning outcomes and student satisfaction. Examples of these studies include e-learning, blended learning, and hybrid learning. The format that yields the greatest outcomes for students and educational institutions is a topic of great interest to researchers, educators, and decision-makers in the field of education. As we will see below, comparative examinations of educational formats provide varying findings, suggesting that learning outcomes, student retention, and other aspects are influenced by factors other than the format itself. In this survey of the literature on e-learning, we compare various online teaching methods with conventional on-campus/face-to-face instruction and provide and debate definitions of e-learning, hybrid learning, and blended learning. Starting from this premise, we investigate the variables that influence students' online learning experiences in higher education across a range of formats, with a focus on teacher preparation and professional development. The review

demonstrates some elements are more important than others, and it goes into additional detail about these aspects, which include learning communities, places, student identities, course design, and the role of the educator.

Methods

The current review draws from a literature search (Bryman, 2012; Creswell, 2013; Machi & McEvoy, 2016) to find studies that could address the following research question: what are the variables that e-learning and blended learning have in relation to learning outcomes, student satisfaction, and collaborative engagement in higher education, especially in professional education? In January 2017, a thorough search was conducted using the following search terms: ["e-learning" OR "online learning" OR "blended learning" OR "hybrid learning"] AND ["innovation" OR "teacher education" OR "learning outcome" OR "collaboration" OR "satisfaction"]. The search was conducted in the databases of the Educational Resource Information Center (ERIC) and ProQuest. Only publications published between 2014 and 2017 were included in the systematic search to guarantee that the most recent results are included in the review. A total of 135 items were produced by the database searches. After reading the whole articles and debating how to classify them, the writers ultimately decided that 93 of the papers were relevant and divided them into 13 main categories that have an impact on blended and e-learning in higher education. Based on an estimation of the most dominating categories—that is, the categories with the greatest number of hits—the 13 categories were further divided into five groups. The evaluation therefore covers the following areas: places, learning communities and student identities, course design, and educator responsibilities, drawing from a total of 44 papers. Although there are 20 published articles in 2015 as opposed to 13 in 2016 and 11 in 2014, all categories are covered during the course of the term. We begin with a discussion of the chosen comparative studies on online, blended, and face-to-face (F2F) formats before presenting the findings from our reading and analysis of the publications included in the review below.

Comparison studies on online, blended and F2F formats

Several studies (Bernard et al., 2014; Chigeza and Halbert, 2014; González-Gómez et al., 2016; Israel, 2015; Northey, 2015; Ryan, 2016; Southard, Meddaug and Harris, 2015) have compared face-to-face instruction to online and/or blended learning to determine which format yields the best learning outcomes, student satisfaction, and course completion rate. Current comparative study on the three forms is summarized below. The main objectives will be to outline these studies and discuss some of the concerns with comparative instructional design analysis. The research shows that many other factors affect teaching and learning, not only the teaching style. We shall define each of the three teaching and learning forms based on format research before comparing them. Scholars disagree on the notion of "blended learning" (Bernard et al., 2014; Chigeza and Halbert, 2014), but they agree on the three formats' distinctions. However, definitional inquiries appear to affect "online learning" and "face-to-face learning" less than "blended learning" in the investigated papers. Many agree on their significance. Many authors call face-to-face learning (F2F) "traditional," citing its longer history among the three formats, while online and blended learning are considered modern or innovative. This word often refers to an educational framework where instructors and students are present in a classroom at the same time. Even with computers and other instructional technology in the classroom, one study found that face-to-face learning (F2F) did not change (Bernard et al., 2014). Online learning is often contrasted with face-to-face training (Ryan et al., 2016). The main feature of this strategy is the use of web-based technology to replace conventional classrooms and allow for flexible learning outside of defined timetables and places. Ryan et al. (2016) state that "the phrase online learning is often interpreted in the context of higher education as referring to courses that are offered completely online;" (p. 286). VLEs and LMSs like Moodle and Blackboard are used to expose students to online learning (Pellas and Kazanidis, 2015).

Blended and hybrid learning are often used interchangeably, according to Ryan et al. (2016). Bernard et al. (2014) define blended learning as "the combination of instruction from two historically separate models of teaching and learning: traditional F2F learning systems and distributed learning systems" (p. 91), elaborating on Graham's 2005 definition. Blended learning may be more effective than F2F and online learning when "optimally integrated" (Israel, 2015) (Pellas and Kazandis, 2015; González-Gómez et al., 2016). According to Adams, Randall, and Traustadóttir

(2015), blended learning combines the "benefits" of both forms. The ratio of face-to-face and online instruction in a course seems to constitute blended learning, according to many studies. The lowest constraints of in-class components in blended learning appear to be at least 50% of total course time allocated to F2F (Bernard et al., 2014). Numerous studies compare the effects of blended and face-to-face learning on student learning. The meta-study by Bernard et al. (2014) on blended learning in higher education found that blended students outperformed normal classroom students by a little margin. Similar findings have been achieved by other studies (Israel, 2015; Northey, 2015; Southard, Meddaug, and Harris, 2015; González-Gómez, 2016; Ryan, 2016). Not all of the information above explains why online and blended learning students do better. Bernard et al. (2014) found that integrating technology into blended learning courses has a small but significant positive impact on student achievement, especially when it provides cognitive support (like simulations) or encourages student interaction (with teachers, peers, and content). González-Gómez et al. found in 2016 that teacher training students perform better in general science courses using a flipped classroom blended learning strategy. Israel (2015) and Potter (2015) note that there is no specific predictor, but the former notes that the blended format has modestly positive effects on students' learning outcomes, while the latter notes that students' grades are "significantly higher in the hybrid option than for the traditional face-to-face format" (p. 7). Blended learning is thought to improve academic performance, while other evidence suggests the opposite. Adams, Randall, and Traustadóttir found in 2015 that university students who did a hybrid microbiology introductory course fared lower than those who took it in person. Hybrid students may do poorly due to alienation from class attendance or topic engagement. Powers et al. (2016) found that hybrid students' test scores dropped significantly across the semester in an introductory psychology course. Students in the hybrid program may have had to acquire complicated topics on their own without adequate face-to-face training, which may explain their achievement disparity. Another study finds a different outcome and explains it using comparable settings. Northey et al. (2015) found that blended education students perform better academically because they have more opportunities to work independently in student-centered, asynchronous collaborative learning activities supported by Web 2.0 media like Facebook. Our examination of studies comparing face-to-face instruction versus online and mixed learning found no fundamental difference in student learning. Context and circumstance decide either, not format. Some factors hurt students' learning, while others help (Powers et al., 2016; Northey, 2015). In their comparative study of community college students in traditional classroom-based and blended courses, Ryan et al. (2016) conclude, "[..] blended learning opportunities are carefully designed to capitalise on both technological advances and multidisciplinary knowledge about academic content, as well as learning and instruction" (p. 296). In other words, technology, context, and learner qualities tend to influence learner outcomes in mixed and online learning contexts (Ryan et al., 2016, p. 296).

First, we'll look at places, then learning community, and finally student identity. This category is a major factor in higher education e-learning and blended learning. 2. Spaces, learning communities, and student identities This section of the review examines learning communities, teaching and learning environments, and student identities, focusing on the elements the reviewed literature identified as crucial to professional education students' online and blended learning experiences. Online components of blended learning education have significant effects on students' perceptions of the learning environment, learning community, and their personal identities as learners, according to numerous studies. Some study shows that asynchronous online learning settings have less student-instructor contact (Saghafi, Franz, and Crowther, 2014). (Tambouris, Zotou, Tarabanis, 2014; Israel, 2015; Bolsen, 2016). However, this and previous studies has shown the advantages of online learning. Benefits include "shifting the learning environment to a more social, flexible and personal space" and promoting student-centered, problem-solving, social constructivist education. Additionally, current learning settings are increasingly defined by the latter. Saghafi, Franz, and Crowther (2014) argue that online learning will not replace F2F activities in higher education. Their research shows that face-to-face and web-based learning have downsides as well as benefits. If a thorough blended learning paradigm is adopted, both settings benefit students in complementary ways. Students need practice-related workshops, especially in professional education. Students most value flexible, 24/7 workshop venues, whether virtual or in-person. In Saghafi, Franz, and Crowther's comparative study, the virtual asynchronous workshop is better for constructive discussion, design development archiving, and progress review, while the face-to-face synchronous workshop supports hands-on skills

training, peer learning, and spontaneous feedback. Westermann (2014) and Gonzàles-Gómez et al. (2016) found that the dual classroom setting combining online and F2F learning helps enhance specific skills. Westermann's research indicated that publishing written peer and teacher comments in an online discussion forum enhanced students' critical thinking abilities by preparing spoken peer discussion in the classroom (Westermann, 2014). Gonzàles-Gómez et al. found that students are better prepared to solve general science problems in the classroom and lab when they can watch online video lessons and instructions on the theoretical and practical aspects of lab work before or after class. Tambouris et al. (2014) and Olsson, Mozelius, and Collin (2016) examine blended learning's online visualization potential. Both studies illustrate how web technology may be utilized to create a visual learning environment for students. Tabouris et al. (2014) found that Web 2.0 technologies in an online learning platform for project visualisation improve graduate students' problem-based learning project execution. As said, the online component of blended learning education tends to have a big influence on students' views of the learning community and themselves as learners. Many studies have examined "the incorporation of information and communication technologies into the learning and teaching experience"'s inconsistencies (Joksimovic et al., 2015, p. 638). Online learning management systems (LMSs) in blended and online learning have several benefits, according to Cheng and Chau (2014). These include new student-teacher, student-content, and student-student channels. Asynchronous engagement, limited visual interaction, and student geographical dispersion are also tolerated in LMSs' digital learning environments (Joksimovic et al., 2015). Thus, community is essential to online and blended learning students' experiences. They find it hard to build an online social presence (Joksimovic et al., 2015; Barber, King and Buchanan, 2015; Fletcher and Bullock, 2015). A sense of belonging to relevant online learning communities has also been connected to student engagement and academic performance (Joksimovic et al., 2015; Tomas, 2015). Despite their importance, student-to-student interactions and group projects are not the only way online and hybrid learners may feel like they belong. The presence of a good teacher and fascinating academic subject are both important for this feeling (Tomas et al., 2015; Joksimovic, 2015). Many studies have examined how and to what extent digital learning technologies can support students' sense of belonging to a community of learners, since online/blended learning education makes it difficult to establish meaningful learning communities due to the lack of face-to-face interaction between students and teachers. Online and hybrid learning students' learner identities are tightly related to their sense of belonging to key learning communities (Baxter and Haycock, 2014). Baxter and Haycock argue that sentiments of agency and control that result from belonging to a learning community are essential to learner identity, building on Lave and Wenger (1991). For online students to be motivated and retained, they claim they need "a strong and salient online identity". Their study analyzes how successful online learning forums assist students' social and academic integration to build their learner identities. Their study showed that students' earlier experiences with social media like Facebook were carried over to academic online learning, affecting their learner agency and confidence in both positive and negative ways. Because the online discussion was public, some students believed their contributions seemed authoritative and competent, while others felt they lacked comprehension and did not contribute. Finally, a lack of peer response or instructor supervision tended to adversely effect students' learner identities because they felt isolated from the forum's academic community. This review identifies the following aspects as important to online and mixed learning education:

• Good offline and online learning environments
• dynamic and substantial learning communities that improve students' social and educational experiences
• a strong learner identity

Course Design

This section of the study examines the general structure of the course as well as the components and exercises that scholars believe are pertinent and crucial to the creation of an effective blended/online learning environment in higher education. A particular emphasis is maintained here since we are particularly interested in the online component of blended learning course design in professional education. Many factors may lead to successful outcomes in this area, since course design affects student happiness (Lee, 2014) and their perceived learning (Gray and Diloreto, 2016). The idea that diversity in (online) teaching and learning activities is important may make a general contribution (Cheng and

Chau, 2016; Fedynich, Bradley, and Bradley, 2015). However, there can be a lot of activities and recommendations for particular course designs when research is to provide an answer. By effectively combining online learning with real-world experience, blended learning may better prepare preservice teachers for their future careers in teaching. In this case, integrating digital tools for collaboration and assisting students with their digital literacy are - or ought to be - components of routine practice. Hunt (2015) focuses on utilizing blended learning to introduce authentic learning into teacher education. She comes to the conclusion that blended learning can provide pre-service teachers with a digital platform for collaborative and inquiry-based learning related to practice in the field through thoughtful course design and the use of pertinent digital tools. During the students' fieldwork time, the professors are present and actively involved, and chat sessions serve as a complement to the group work. Since professional programs include both content and skills in their curricula, it is imperative that both on-campus and online learning experiences are relevant to the world of work. As such, course design should be developed to facilitate the transfer of knowledge and the development of skills (Heinerichs, Pazzaglia, and Gilboy, 2016). According to Heinerichs and colleagues, using digital technology in a flipped classroom or in a structure that combines online and offline activities might make this easier. A blended learning design was developed for face-to-face meetings in a study conducted by Sidebotham, Jomeen, and Gamble (2013) involving midwifery students. The design emphasized practice-related activities, roleplays, narratives, and reflection. Additionally, online sessions featuring synchronous discussions, "home-grown" learning resources, and live and active teachers were included. The twin mixes of theory-practice and online-offline activities were considered to have a novel quality. A number of scholars (Rivers, Richardson, and Price, 2014; Simpson, 2016) have focused on the pedagogical value of dialogue to strengthen pre-service teachers' reflective practices and improve their understanding of the value of talk for learning. It is widely acknowledged that it is crucial to engage educators, especially pre-service teachers, in developing their capacity to use emerging technologies to develop teaching approaches that support interactive, engaging, and collaborative learning (Chigeza and Halbert, 2014). In order to include more participatory dialog using web 2.0 technologies in a mixed learning environment, Rivers et al. (2014) track the usage of multiple social networks. Rivers et al. (2014) emphasize in their article's conclusion the beneficial effects that conversation, when used as a teaching technique, has on the students' educational experiences. Additionally, a research conducted in 2015 by Forbes and Khoo investigates the possibilities of student-produced podcasts as a kind of remote interactive formative evaluation. The results demonstrate how the experience gave the teacher training students the knowledge and self-assurance to pursue further independent research into technology to further their educational goals. To prevent students from seeing online activities as less useful than on-campus ones, for example, it might be difficult to provide enough learner support and connect the online activities to campus resources (Fedynich et al., 2015). (Chigeza and Halbert, 2014). Teachers' scaffolding of activities and their relationship to each other (Barber, King, and Buchanan, 2015) may provide a solution to this problem. According to some, a blended learning environment can only be successful if it provides students with a comprehensive pedagogical framework, explicit scaffolding of learning activities (via podcasts or online tutorials), appropriate media use, hands-on assessment tasks, and student-staff communication (Tomas, Lasen, Field, and Skamp, 2015). Additionally, research indicates that educators may need to establish guidelines for their students (such as when, how, and how much to post to the forum), contact the students who are not engaging, and scaffold online forum conversations in great detail at first (Beth, Jordan, Schallert, Reed, and Kim, 2015). Because of the lower need for online involvement, some students feel that online meetings and instruction are less meaningful. For this reason, it's critical to emphasize the interpersonal conversations, interactions, and online activity scaffolding. Accordingly, Chigeza and Halbert (2014) discover that many support paths are required in order for some of these pre-service teachers to be capable of becoming online learners (Chigeza and Halbert, 2014), as well as methods for students to engage in reflective interaction with the material (Donnelly and Hume, 2014). Peer assessment appears to have varying effects on students' learning levels: low- and average-achieving students demonstrated significantly improved performance, but there was less of an impact on the performance of high-achieving students (Li and Gao, 2016). Similarly, some students feel that peer-to-peer support is less valuable (Baxter and Haycock, 2014). Peer-to-peer learning, however, has been shown to increase student satisfaction in online learning environments (c.f. Choi, 2016). Effective online learning, for example, should incorporate social interaction and peer-

to-peer networked learning to support self-reflection rather than just providing access to information (Cheng and Chau, 2016). In blended learning environments, social contact and appropriate use of internet resources are both shown to provide captivating learning experiences. Web-based lectures are perceived as valuable by students, according to several researchers (Martín-Rodríguez, Fernández-Molina, Montero-Alonso, and GonzálezGómez, 2015; Montrieux, Vangestel, Raes, Matthys, and Schellens, 2015). This is particularly the case when the lectures serve as course preparation (Montrieux et al.) and as a way to improve learning across gender and ethnic groups (Lancellotti, Thomas, and Kohli, 2016). Additionally, a number of research show that student satisfaction and learning outcomes are highly dependent on possibilities for contact between students and their instructors (Chiero, Beare, Marshall, and Torgerson, 2015; Fedynich et al., 2015). In summary, the most significant components identified in this section of the study are to interactions, linkages, and scaffoldings between practice-related and campus-related activities, as well as between students, instructors, and material.

Educator roles and relations

The last section of the study examines the responsibilities and relationships of educators, focusing in particular on the aspects that the examined literature indicates have a major impact on students' learning in professional programs that are delivered in blended or online forms. According to a number of studies, courses that effectively support online student engagement and learning must include both a strong educator presence and high-quality course material (Moore, 2014; Swan and Shih, 2014). There are many approaches to establish an educator's presence in online courses, including frequent connection with students, consistent feedback, and modeling critical discourse (Gray and DiLoreto, 2016). According to Southard, Meddaugh, and France-Harris (2015), Martín-Rodríguez, Fernández-Molina, Montero-Alonso, and González-Gómez (2015), online students must feel connected to the instructor, other students in the course, and the course content. This can be accomplished in a supportive learning environment where instructors intentionally combine audio, video, synchronous and asynchronous discussions, practical activities, and other online tools to engage students (Gray and DiLoreto, 2016). In particular, in pure online courses where there is little to no synchronicity between the student and the educator, Southard, Meddaugh, and France-Harris (2015) found that the use of high-impact videos featuring the educator and/or the course content is particularly useful in promoting a strong educator presence and in cultivating students' interest in the topic under study. In the research conducted by Southard et al. (2015), props and stop-motion videos featuring still objects that came to life and moved while the teacher narrated were employed to enhance students' sense of connection to the teacher and the material. Introductions to undergraduate history classes were also recorded on historical sites (Southard, Meddaugh and France-Harris, 2015). Studies suggest that virtual learning communities may foster a sense of camaraderie among students and foster mutual trust as a means of constructing and expanding one's own knowledge (Cho and Tobias, 2016). But it's also evident that this kind of participation is not automatic; building a learning community requires time and can only be done with diligent work (Beth, Jordan, Schallert, Reed, and Kim, 2015). In addition, it is essential that participants have a sense of human-to-human connection in order to foster both professional and personal relationships. The involvement of an instructor may play a significant role in fostering student engagement in this regard (Cho and Tobias 2016). According to a number of studies, educators can help students participate in asynchronous online discussions by giving them clear instructions on how to start and join in online discussions that promote learning (Beth, Jordan, Schallert, Reed and Kim, 2015; Cho and Tobias, 2016). Beth et al. (2015) draw the conclusion that educators can effectively scaffold students' online discussions in terms of both quantity (e.g., online discussions were scheduled at regular intervals and students were required to post a minimum number of posts) and quality (e.g., students were instructed to use a conversationally inviting tone, to provide contextual information, and to address academic questions and comments to their peers). This study examines how responsibility and generativity were enacted in asynchronous online discussions in a hybrid course. Others have discovered that synchronous online classroom sessions with interaction and discussion may favorably impact students' perceptions of closeness to their instructor and other students in blended courses with few in-person classes (Sidebotham, Jomeen and Gamble, 2014).

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In blended learning, the instructor must support students' learning both virtually and in-person, necessitating a special set of roles and duties. In a study examining the perspectives of teacher training students regarding the instructional activities of blended courses, Hall and Villareal (2015) discovered that while specific and timely feedback as well as individualised responses to online assignments are of primary importance in the online environment, educators should emphasize active participation in face-to-face classes and provide plenty of opportunities for students to interact and collaborate with the teacher and their peers. Further research reveals that instructors should provide opportunities for students to apply the theory they have studied, as well as to discuss and practice the practical aspects of the profession that might not translate well online, in face-to-face (F2F) blended courses intended for professional bachelor programs (Sidebotham, Jomeen and Gamble, 2014; Hall and Villareal, 2015). Above all, to prevent students from feeling alone, teachers should be immediately accessible to them online and, wherever feasible, in person (Hall and Villareal, 2015; Israel, 2015; Hunt, 2015). Teachers have several difficulties when facilitating teaching and learning in an online setting. They often find it difficult to translate the strategies they have found successful in face-to-face instruction to an online setting (Mills, 2015). According to Fletcher and Bullock (2015), teacher educators face unique challenges in this regard because asynchronous online environments have the potential to hinder the development of positive relationships between teachers and students—a relationship that is deemed crucial for meaningful teaching and learning by the majority of teacher educators. Their findings suggest that professional teaching programs should ideally include both synchronous online class sessions and face-to-face contact in addition to asynchronous instruction. In summary, the following elements have emerged as being particularly important when it comes to the role of the educator in online, blended, and e-learning:

• creating online learning communities that promote goodwill and a strong instructor presence in these environments

II. CONCLUSION AND DISCUSSION

Comparing various e-learning, online, hybrid, or face-to-face (F2F) course formats is a common study and educational institution issue, since it aims to determine which format is more beneficial in terms of learning outcomes and student satisfaction, for example. But studies reveal that learning and teaching are intricate processes that are impacted by factors other than the style of instruction. We should therefore investigate the many variables that impact instruction and learning across a range of forms and environments. With a focus on professional education and teacher training, this literature review has examined the variables influencing students' learning experiences in online, blended, and e-learning environments in higher education. The results from the research papers that were part of the review indicate that while there are many factors, some stand out more than others. These include the presence of educators in online environments, interactions between students, teachers, and content, and intentional linkages between activities that take place on campus and those that take place off campus. More precisely, a wealth of recommendations for certain course designs that have been shown to work in a given setting are provided by the evaluated literature. Research consistently shows that blended learning and e-learning programs should be structured to provide consistency between virtual and real-world activities, between academic and practical activities, and between instructors, students, and the material. The educator's role in creating an online learning community that promotes positive relationships and in establishing a strong educator presence in online settings are two aspects of educator roles and relationships that are reported in the reviewed literature to have a significant impact on student learning in professional programs offered through blended or online formats. Regarding the students, studies show that a variety of variables affect how well they learn in online, mixed, and e-learning environments. The elements that the studied literature emphasizes as being especially crucial for professional education The existence of suitable online and offline teaching and learning environments as well as vibrant, purposeful learning communities that foster students' interpersonal relationships are all important components of students' educational experiences and sense of self as learners.Though more research is required to fully understand what influences students' learning experiences in the online formats of professional bachelor programs, the literature review indicates that there is a great deal of interest in the field of educational research to identify the factors that affect learning outcomes and student satisfaction in e-learning, online learning, and blended learning in higher education.

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