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Research group 'Online education during COVID-19'

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18 December 2020

Background of the study

In recent years, it has become clear that forms of online education¹ will play an important role in the future of higher education, a process that was accelerated by the transition to online education in response to the COVID-19 pandemic. This transition occurred ad hoc and heavily relied upon teachers' improvisational skills and prior experiences with online education. Yet, many teachers and students miss benchmarks of effective online education, partly as they have often never experienced online or blended education themselves.

Online forms of education are not necessarily 'second best', but for these to be effective requires more than to simply transfer an existing course to an online or blended environment. In order to live up to the expectations of online and blended education of its advocates—e.g., more flexibility, better student performance, high motivation, and its contribution to lifelong learning—careful implementation based upon evidence-informed insights is needed.

At the request of the Executive Board of the University of Amsterdam, a review of scientific literature was conducted to synthesize research on effective online and blended higher education. These insights can inform teachers regarding online or blended course design and pedagogical practices, and inform policy-makers on the implementation of online and blended education.

This study

Central to this study was the following research question: *What factors contribute to effective online or blended teaching and learning in higher education?*

To answer this question, we analyzed 29 recent (published between 2010 and 2020) peer-reviewed literature reviews and meta-analyses concerned with effective online and blended higher education. As illustrated in Figure 1, we analyzed these studies by looking at four key factors: the course, the student, the teacher, and the institution. The course is the central learning setting in higher education where learning goals are attained, the effectiveness of which depends on the motivation, skills and beliefs of both students and teachers. In addition, the institutional context either enhances or limits effective online and blended education. Our findings are presented in line with these four factors.

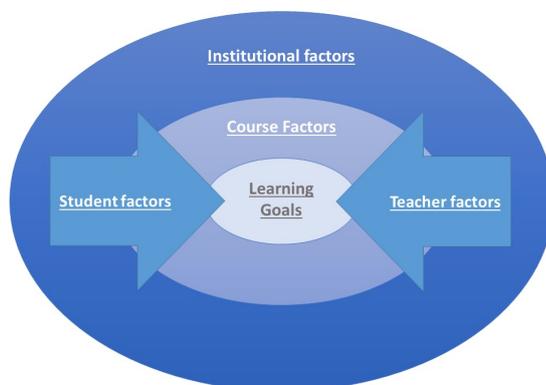


Figure 1. Conceptual framework

¹ As research on online education is highly interconnected with research on blended education, we opted not to make a strict distinction between online and blended education.



Course factors

1. A well-thought course design and structure

What do we know from research? A well-designed and effectively delivered online or blended course results in a deep sense of learning and is related to high satisfaction, high student achievement, and low dropout rates.

Why is it particularly relevant for online/blended education? Effective online education requires more than to simply transfer a face-to-face course into an online environment. In online environments, teachers must be more explicit and transparent regarding the design and structure of the course, because there is less room for teachers to make instant in-class course adjustments or to provide quick one-on-one support to students. Further, online education requires students to take more initiative and control over their learning process. Clear guidelines can help students to anticipate the course of events and plan accordingly.

How can it be achieved? A well-designed online course consists of high quality instructional materials, meaningful learning activities, multiple assessments and a clear course structure. *High quality instructional materials* are both engaging and challenging. They are designed to meet the needs and interests of students, and include various types of support that enable students to accomplish tasks that might otherwise be out of their reach (e.g., the material highlights relationships among complex concepts or provides additional information that helps to complete difficult assignments). *Meaningful learning activities* appeal to a diverse range of students and resemble or refer to real-life situations that students are likely to encounter in their future career. *Multiple assessments* (e.g., a combination of pre-and in-class quizzes) can allow teachers and students to specifically monitor the learning progress. Finally, a well-designed course requires a purposeful alignment of all course components through a *clear course structure*. A clear online course structure includes: a prespecified set of learning activities, a logical format for instruction materials, a realistic course timeline, course protocols that specify the communication process between and among students, and clear evaluation criteria.

Providing a clear structure is not only the responsibility of course developers, but also of university directors. Directors are advised to facilitate a comprehensive and steady environment that both teachers and students can act upon in a relatively predictive manner. Teachers and students can only plan effectively if their environment is clear and predictable. This implies to maintain active and clear communication with teachers and students, and to guarantee a stable and stimulating learning space with sufficient resources. For example, by accommodating teachers with spaces where they can teach without being disturbed.

2. A high sense of belonging

What do we know from research? A higher sense of belonging is associated with high motivation, low dropout rates, and is related to a more positive learning experience in general. Research suggests



that students' decision to discontinue their online education was often motivated by a poor sense of community due to minimal interaction with their peers and teachers, and an isolated, unsupported feeling.

Why is it particularly relevant for online/blended education? Engaging students is a key task of every teacher, but is especially difficult if students are, literally, at a distance. Although modern technology has made it increasingly easier to communicate over the internet, online interaction is still not a comparable replacement for face-to-face interaction. The number of opportunities for (informal) social interaction are strongly reduced online, making it more difficult for students and teachers to genuinely connect. Further, teachers receive fewer and more ambiguous (non-)verbal cues from students, making it difficult for teachers to assess how students feel and whether students are following along.

How can it be achieved? A sense of belonging can be facilitated through a thoughtful selection of tools (e.g., videoconferencing) and pedagogical strategies (e.g., how to facilitate interaction?) that allow students to present themselves as 'real', authentic human beings. In effective online or blended education, moments of interaction are carefully planned and purposefully incorporated. For example, collaboration tasks and online discussions may increase students' feeling that they are part of a (learner) community. In this regard, it is important that the intended community is inclusive enough and appeals to a diverse student population. In addition, institutions can foster collaboration between faculty members and students through direct involvement in the university's policy decisions (e.g., through student councils). Having 'a seat at the table' can promote students' sense of belonging and ensures better alignment between institutional policies and students' needs.

Student factors

3. Students' self-regulation skills

What do we know from research? Self-regulated learning implies that students take ownership over their learning process and are able to autonomously interact with the learning material. Research suggests that students with high self-regulation skills (e.g., time management and effort regulation skills) tend to attain a deeper sense of learning and achieve better in online or blended education than students with low self-regulation skills. Further, research suggests that particularly students at risk to delay or dropping out (e.g., first year students or first generation students) need guidance to acquire and enhance their self-regulation skills.

Why is it particularly relevant for online/blended education? Online students generally receive less (informal) guidance, because they tend to interact less with peers and teachers. This requires students to be more self-reliant.

How can it be achieved? Teachers and policy-makers play a central role in enhancing students' self-regulation skills. Teachers can stimulate students' self-regulation through the learning activities. For example, by stimulating students to critically reflect on their progress or by helping them to create a study schedule. Further, as online students interact less with their teachers, peers become an



essential source of assistance. Therefore, teachers are advised to stimulate self-regulated learning not only on an individual level, but to also stimulate learning through peer-facilitated online (support) groups (e.g., peer buddy systems). In addition, the institution can support students by offering (online) workshops where students can enhance their self-regulation skills or by providing students insight into their progress through learning analytics.

4. Students' digital literacy

What do we know from research? Although most students are quite accustomed to living in a digital era, it should not be assumed that all students have sufficient digital literacy. Digital literacy colloquially refers to the ability of students to effectively collect, analyze and use online information in a way that benefits their learning progress. Students' familiarity and confidence with the use of online environments affects their satisfaction with online education and their academic achievement.

Why is it particularly relevant for online/blended education? Heavy use of online tools and platforms makes digital literacy a crucial determinant for effective online and blended education.

How can it be achieved? Teachers should provide students with clear instructions on the tools and platforms that are used in the course and proactively assist students to promote effective use of the tools and platforms. Moreover, institutions can offer instruction manuals, technological support or provide additional training opportunities for students to further improve their digital literacy.

Teacher factors

5. Reconsidered teacher roles

What do we know from research? In effective online education teachers are not just *disseminators* of knowledge, but also: *facilitators* of students' learning process, *designers* and *managers* of courses, and *nurturers* of social relationships and communication with and between students. Although these roles are not specific to online education, online teachers are more directly confronted with the importance of these roles and how they contribute to effective online education.

Why is it particularly relevant for online/blended education? The fundamental nature of online learning environments (e.g., challenges to facilitate interaction) require online teachers to be more aware of their multiple roles. Consequently, online teachers need to be more explicit about how and when they intend to take on which role, whereas the transitions between these roles may flow more naturally in a face-to-face context. For example, offering one-on-one support to students is generally easier in many face-to-face contexts than during an online lecture.

How can it be achieved? The adoption of these multiple roles requires the development of a broader set of knowledge, skills and attitudes that is specific to online teaching. Four domains of knowledge and skills are particularly relevant to online teaching. First, teachers need *interpersonal skills* to allow them to present themselves as accessible, attentive and responsive persons. Through deep listening



and careful communication teachers are able to avoid communication issues. Second, teachers need *organizational skills*, because they need to think in advance about the structure and organization of their course, and be explicit about their planning. Third, online teachers need to have sufficient knowledge of the tools and platforms to effectively use them to create meaningful learning experiences, also referred to as *technological pedagogical content knowledge* (TPACK). Fourth, teachers should be *flexible* enough to cope with technical issues and to adjust to new forms of (online) communication.

6. Professional development through (online) teacher collaboration

What do we know from research? Promoting teacher collaboration is crucial for teachers' professional development. Teachers who constantly interact with each other improve their professional practices and create a collegial bond with fellow teachers. Research shows that many teachers are hesitant to participate in (online) collaboration initiatives. Particularly in an online environment, teachers find it difficult to exchange ideas and concerns.

Why is it particularly relevant for online/blended education? As online education is new to many teachers, they have to further develop their online teaching practices. Therefore, teacher collaboration is crucial for further professional development.

How can it be achieved? Teachers collaboration can be promoted through a regular schedule of meetings focused on online teacher collaboration, trainings on how to use ICT for collaborative purposes, and by providing sufficient resources for teacher professional development (e.g., through a professional learning community).

Institutional factors

7. A clear and integral implementation strategy for online and blended learning

What do we know from research? A clear and integral implementation strategy promotes the integration of online and blended forms of education. An effective implementation strategy primarily focuses on the willingness and ability of teachers and students to integrate new (online) educational innovations. An implementation can only succeed if both teachers and students view innovations as possibilities to improve education. Further, for an effective implementation of online education it is important that there is an adequate and sustainable infrastructure with the necessary (online) tools and platforms. Teachers and students need support to use these tools and platforms in a way that they contribute to effective online education.

Why is it particularly relevant for online/blended education? Implementing online and blended learning coincides with integrating multiple innovative forms of educations and its corresponding tools and platforms. To effectively implement these innovations it is important that teachers and students are willing and able to integrate these into their educational practices.



How can it be achieved? In an innovative culture teachers and students are involved during the development and implementation of the innovations. Active and early involvement increases the support amongst teachers and students and thereby increases the odds of a successful implementation of online and blended learning.

Further, teachers can be supported through trainings where they learn how to effectively use the innovations to improve their teaching practices. Tutor or peer buddy systems may be set up to support students and to guide them when giving shape to their online or blended learning.

The available infrastructure has to result from a thoughtful selection of (online) tools and platforms that are in line with the needs of teachers and students. Next to using existing tools and platforms, university directors may consider to set up partnerships aimed at developing accessible tools and platforms that contribute to effective online and blended education. Adequate support (e.g., through manuals or an ICT helpdesk) promotes effective use of the infrastructure by teachers and students.

Main conclusion

When thoughtfully implemented, online and blended education may be just as effective as face-to-face education. Our review suggests that effective online and blended education requires: 1) a well-thought course design; 2) high sense of belonging; 3) students with high self-regulation skills and sufficient digital literacy; 4) reconsidered teacher roles; 5) stimulating professional development through teacher collaboration; and 6) a clear and integral implementation strategy for online and blended learning. Online education initially demands more organizational effort than face-to-face education, but may ultimately be more efficient in the long run as some online material (e.g. recorded lectures) may be reused in subsequent years.

Call for more research

As a final note, the academic and societal interest in online and blended education rapidly increases. More knowledge is needed about the effectiveness of specific online teaching and learning practices. Future research on online or blended education may focus on the effectiveness of:

- ... specific learning goals (e.g., knowledge-transfer or skill-development)
- ... specific pedagogical strategies (e.g., synchronous or asynchronous (online) discussions)
- ... specific course characteristics (e.g., small-scaled or large-scaled courses)
- ... specific populations (e.g., academic disciplines or students' background differences)
- ... specific (online) tools (e.g., text-based tools or videoconferencing software)

