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# **THEORETICAL AND APPLIED ASPECTS OF THE DEVELOPMENT OF SCIENCE**

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## **SOME PECULIARITIES OF ONLINE TEACHING AND LEARNING**

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It is a matter of common knowledge that an almost immediate switch to online learning was one of the many changes COVID-19 brought in education. Educational institutions struggled to bridge the physical distance between teacher and learner. Traditionally trained teachers made valiant efforts to adjust to this new situation by recording lessons, posting videos and creating breakout rooms, using whatever technology they had available. These efforts resulted in digitally mediated physical classrooms using the internet. However, posting materials online, recording lectures and discussions themselves do not create a coached, collaborative and supported learning environment. Thus, it is essential to consider what we have really learned about online education to highlight some peculiarities of online teaching and learning.

Online learning is not new, and lessons can be drawn from existing research and experience. The experience of online pioneers highlights some distinct aspects of online learning: learning to learn online, designing online teaching with purpose, blending space and time online and continued disruption with AI [1].

### 1. Learning to learn online

The pandemic highlighted that one-size-fits-all educational approaches fail to address student needs. Younger learners may seek physical spaces to promote socialization, with supervision and teacher-led content delivery. Adult learners value the convenience of communicating with classmates and teachers online at a convenient time for them. Common inequities like poor access to the internet, lack of financial resources and needed digital competence plague online learning. However, online education offers access for students facing geospatial barriers to traditional classrooms. Further issues of inequality are addressed via multi-modal distance education, financial support structures and orientation on how to learn online. Emergency online education used blunt-edged instruments, ignoring student and program differences. The pandemic takeaway, however, is the importance of preparing all students to learn, whether online or in a physical classroom.

### 2. Designing online teaching with purpose

Quality teaching and learning design must incorporate active, engaging roles for individual students, whether designed for traditional or distance education. Meaningful teaching varies by setting and requires different approaches. Online course and teaching design is learner- rather than content-centred, incorporating high engagement in collaborative learning groups that fosters active learning. Producing effective online course materials requires an approach involving instructors and skilled course developers and takes months rather than weeks. Course materials are painstakingly detailed, and include writing everything the instructor would expect to say in a physical classroom, clearly describing all course requirements and linking students to readings,

video and online resources. Because of the pandemic, instructors had to translate classroom delivery into technology-mediated delivery. It worked for some, but was not easily tailored to unique learning needs. Technological tools, combined with independent and joint working opportunities, should be brought back to the physical or hybrid classroom in conjunction with online pedagogical approaches that increase active, collaborative learning and learner-generated choices.

### 3. Blending space and time online

Pandemic education popularized the vocabulary of “synchronous” and “asynchronous” learning. Synchronous replicated physical classrooms through real-time, digitally mediated teaching, while asynchronous meant working independently, usually with materials designed for a physical classroom. Under the existing conditions students come together in time and space through blended, collaborative, synchronous and asynchronous online learning. Instructors coach students individually at a student led pace. This is different from traditional undergraduate classrooms, where students absorb material on a fixed schedule. More flexible teaching allows students to receive instructor support when they need it. Building in synchronous, collaborative learning allows for reflection, rather than real time responses.

It should be noted that adopting online and AI tools needs to be deliberate, coupled with supportive digital infrastructure and highly responsive student support. Planned carefully and taken together, these steps improve on traditional approaches by making education truly open, accessible and inclusive [1].

Now, the question for all educators should be: How can we capitalize on the changes brought about by COVID-19 to create better education systems in the future? Another question is whether online learning at universities and colleges can ever be as effective as face-to-face learning. Systematic analyses of the evidence generally show there are no significant differences in students’ academic outcomes between online and face-to-face education [2]. Researchers also find that some students perform worse online than others and that some of those differences can be explained by socioeconomic inequities.

The problems with media comparison studies, that is, those that compare outcomes between one medium, such as face-to-face, to another medium, such as online, are such that many researchers advocate against them. The point is that students who enrol in online courses in the fall should know they are receiving a good educational experience. Therefore, let us consider some of the qualities of a good online course.

1. A good online course is informed by issues of equity and justice. It takes into account social, political and cultural issues including students’ backgrounds and socioeconomic circumstances. This may take many forms. In practice, it may mean a diverse and intersectional reading list. It means audiovisual materials that do not stereotype, shame or degrade people. It may mean that open educational resources are prioritized over expensive textbooks.

2. A good online course is interactive. Courses are much more than placeholders for students to access information. A good online course provides information such as readings or lecture videos, but also involves interactions between professor and students and between students and students. Interactions between professor and

students may involve students receiving personalized feedback, support and guidance. Interactions among students may include such things as debating various issues or collaborating with peers to solve a problem. A good online course often becomes a social learning environment and provides opportunities for the development of a vibrant learning community.

3. A good online course is engaging and challenging. It invites students to participate, motivates them to contribute and captures their interest and attention. It capitalizes on the joy of learning and challenges students to enhance their skills, abilities and knowledge.

4. A good online course involves practice. Good courses involve students in “doing”, not just watching and reading, “doing again” and in applying what they learned. For example, in a creative writing class, students may write a short story, receive feedback, revise it and then write a different story. A good online course is effective. Such a course identifies the skills, abilities and knowledge that students will gain by the end of it, provides activities developed to acquire them and assesses whether students were successful.

5. A good online course includes an instructor who is visible and active, and who exhibits care, empathy and trust for students. This individual understands that their students may have a life beyond their course. Not only do many students take other courses, but they may be primary caretakers, have a job or be struggling to make ends meet. Good online courses often include instructors who are approachable and responsive, and who work with students to address problems and concerns as they arise.

6. A good online course promotes student agency. It gives students autonomy to enable opportunities for relevant and meaningful learning. Such a course redistributes power in the classroom to the extent that is possible. Again, this may take many forms in the online classroom. For example, in an accounting course, students could analyze the financial statements of a company they are interested in rather than one selected by the instructor. Such flexibility not only accommodates students’ backgrounds and interests, it provides space for students to make the course their own. In some cases it might even mean that students co-design the course with their instructor. This is the kind of flexibility higher education systems need.

It is also worth noting that physical proximity is not a precondition for good education. Comparing one form of education to another distracts us from the fact that all forms of education can and should be made better [2].

Technology has become the centre of our lives. It has also changed how university students learn and how lecturers teach. Some educational institutions had already shifted to some form of online teaching and learning before 2020. Then the onset of the COVID pandemic made digitised education commonplace in many parts of the world.

But it is not enough for universities to offer technological platforms. Those who transfer knowledge – lecturers – must do so skilfully. They must also be able to appropriately support their students through any challenges related to online teaching platforms. It is obvious that universities should offer their staff continuous professional

development in distance education and e-learning. This will help lecturers to better support and improve the quality of students' learning experiences. A lecturer's lack of online facilitation skills can have a negative impact on learner outcomes. Lecturers cannot impart skills they themselves lack or facts they do not know to students. It is clear that universities, whether they are partially or fully online, should take the following steps [3]:

- Conduct institution-wide surveys to assess the readiness of academic staff for online teaching. The feedback can inform skills development plans and support systems both for academic and support staff.

- Create a platform for staff members who complete online teaching training programmes to share information and their experiences. This will contribute to the wider implementation of e-learning. Staff members who complete formal e-learning training programmes also need to be strategically co-opted in research, discussions, and projects within the university to share their knowledge more widely.

- Ensure that staff are properly trained and prepared to adapt and to adopt new technologies.

- Ensure that students are creatively and actively engaged using the digital platforms developed as part of e-learning programmes. This includes being visible on digital platforms such as discussion forums and actively interacting with the students.

Obviously, one thing the COVID-19 pandemic has not changed is the need for training and skills development. Although lockdowns have reduced access to offices and increased job insecurity, they have provided the time and opportunity for building skills. Demand for professional development has grown. Since early 2020, the only option for employees to upskill has been through remote learning. Training and development specialists have been working tirelessly to adapt programs and courses for online delivery. For most, this has meant replacing face-to-face workshops with dial-in sessions using teleconferencing software. Unfortunately, these changes have not always been effective. In other cases, employees have been applying their own personal, informal learning methods to develop professionally.

In comparison, the global online education sector has steadily and organically expanded over the past 25 years. The characteristics of online learning, which can connect a larger and more diverse student body, make it truly scalable and sustainable. Flexibility, accessibility, and social connectedness are the most important things to consider when analyzing the role of online education in the process of providing professional development online.

#### 1. Flexibility

Online education is growing rapidly because of its flexibility. Students can study from wherever, whenever. This means they can maintain roles such as work, parenting and other commitments alongside their studies. Flexible online learning is erasing traditional boundaries of time and place. To provide flexibility in professional development, learning should no longer be restricted to a single day and venue. A combination of scheduled and self-paced learning options provides collaborative and independent learning opportunities as needed. Flexible learning options work best for learners who can stick to their learning plans and schedules and dedicate their attention



to these tasks without distractions. Employers can support flexible learning by respecting these learning plans. This means allowing employees to schedule work around their learning.

## 2. Accessibility

A more diverse student body calls for more inclusive teaching and learning practices. The best examples of online education offer all students the same opportunities to do well. Both learning material and learning management systems need to be reliable and accessible to all. That includes people who are living in remote parts of the country, those who cannot leave the home due to family commitments, or students with special needs who require learning resources to be created that take account of these needs. Similarly, the use of online learning technology for professional development should act as a learning enabler, not a learning barrier. Advanced learning technology and software – learning management systems such as Moodle, for example – can bring both accessibility and innovation to professional development. It makes for a smoother and more engaging learning environment. Organisations may need to invest in accessible learning technology – just as they would invest in creating accessible and inclusive office spaces.

## 3. Social connectedness

Learning remotely, like working remotely, can be isolating. Creating meaningful opportunities to nurture a sense of belonging and connectedness among students is a challenge for online educators. But the benefits of social connectedness are worth the effort. It is associated with greater academic performance, self-confidence, engagement, retention and satisfaction. Students who opt for the flexibility of online education are often time-poor or focus on multiple competing demands. They prioritise their goal of learning over their social needs. For this reason, relying on these students to initiate interaction through social forums can often be ineffective. Rather, trainers should embed social collaboration in core online learning activities. Activities that involve collaboration include peer review and simulation tasks. Online meetings and workshops should also be designed to capitalise on the interplay of learning and dialogue. Activities like these ensure participants can maintain focus on learning goals while reaping the benefits of social interaction.

Nowadays, universities are expanding their educational offerings for professional development. They now offer affordable, accredited and verifiable online study options such as short courses. These courses bridge the gap between higher education and industry needs – bringing a high standard of learning and innovation directly to employees, without the costs of travel or relocation [4].

During the COVID-19 pandemic, keeping students motivated as classes move online has been crucial. The role of student motivation in the process of learning is well known. However, the area of teacher motivation has not received as much attention. Even teachers themselves sometimes overlook the importance of their motivation in the profession. The pressures of the pandemic may have exacerbated the factors which cause teachers to lose motivation, and negated the aspects that teachers find motivating.

Teacher motivation is closely linked to student motivation, and teachers who are motivated to teach can trigger students' motivation to learn. Teachers can have an

impact on students for better or for worse but if teachers are motivated, this influence will be more positive.

The factors that might lead to teachers losing enthusiasm for their work will sound familiar to many. Teachers are often said to not receive enough social recognition for the work they do and are understood to carry a heavy workload which leads to stress and demotivation. Most of the sources for a loss of motivation among teachers are extrinsic – beyond their direct control. These factors include their workload, salary, lack of resources, lack of social recognition, and curriculum limitations. COVID-19 may have accentuated well-known demotivators, such as the lack of support teachers receive from administration and the work overload they can face, which may have a negative impact on their work-life balance and their wellbeing. Researchers have already identified some of the challenges teachers have faced during the pandemic – from a reduction in high-quality interaction with students to a lack of support and challenges with technology.

On the other hand, teachers are motivated by intrinsic factors – a sense of reward which comes from themselves, such as their enjoyment or satisfaction when teaching. It is well-known that teachers like their profession because they can help and educate learners and shape the future of our society. The altruistic value of the teaching profession is a key factor in guaranteeing teacher motivation to teach, but it is not the only reason why teachers choose this career and remain in the profession. Teachers refer to teaching as a profession in which they can keep on learning. A motivated teacher can be described as someone “who does not stop learning”. The teaching profession allows them to be engaged in a lifelong learning process and exposed to new ideas and to be intellectually stimulated, and these factors give them a drive to teach.

During the pandemic, teachers have had to figure out how to teach online and many have engaged in training to improve their performance and make sure they are ready for the challenges of online teaching. Some teachers may have found it a challenging and inspiring experience. However, it could also have been a frustrating opportunity in which teachers were put under pressure to learn something new in a limited time.

In a regular classroom, teachers must alternate between teaching, checking students' understanding, and answering questions. Now, simple actions such as sharing your screen and seeing your students at the same time, replying to messages in the chat while teaching or switching on and off the video and microphone, may become stressful challenges for those new to online teaching.

Teachers have also had to invest more time in adapting their resources without forgetting about their students' motivation and engagement when learning online. Schools and other institutions need to provide support for teachers as they do their jobs under the extra strain of the pandemic. It is also important that teachers focus on their wellbeing, practise self-care and remember the sense of satisfaction they have gained from their profession [5].

Ever since the COVID-19 pandemic caused universities to shift to remote learning in the spring of 2020, student cheating has been a concern for instructors and students alike. To detect student cheating, considerable resources

have been devoted to using technology to monitor students online. This online surveillance has increased students' anxiety and distress. For example, some students have indicated the monitoring technology required them to stay at their desks or risk being labeled as cheaters. Although relying on electronic eyes may partially control cheating, there is another factor in the reasons students cheat that often gets overlooked – student motivation.

Researchers in educational psychology and higher education became interested in how students' motivation to learn, or what drives them to want to succeed in class, affects how much they cheated in their schoolwork. To shine light on why students cheat, they conducted an analysis of 79 research studies and published their findings in the journal *Educational Psychology Review*. They determined that a variety of motivational factors, ranging from a desire for good grades to a student's academic confidence, come into play when explaining why students cheat. With these factors in mind, it is possible to consider a number of things that both students and instructors can do to harness the power of motivation as a way to combat cheating, whether in virtual or in-person classrooms [6]. Here are five takeaway points:

1. Avoid emphasizing grades.

The more students are focused solely on earning high grades, the more likely they are to cheat. When the grade itself becomes the goal, cheating can serve as a way to achieve this goal. Students' desire to learn can diminish when instructors overly emphasize high test scores, beating the curve, and student rankings. Graded assessments have a role to play, but so does acquisition of skills and actually learning the content, not only doing what it takes to get good grades.

2. Focus on expertise and mastery.

Striving to increase one's knowledge and improve skills in a course is associated with less cheating. This suggests that the more students are motivated to gain expertise, the less likely they are to cheat. Instructors can teach with a focus on mastery, such as providing additional opportunities for students to redo assignments or exams. This reinforces the goal of personal growth and improvement.

3. Combat boredom with relevance.

Compared with students motivated by either gaining rewards or expertise, there might be a group of students who are simply not motivated at all. Nothing in their environment or within themselves motivates them to learn. For these students, cheating is quite common and seen as a viable pathway to complete coursework successfully rather than putting forth their own effort. However, when students find relevance in what they are learning, they are less likely to cheat. When students see connections between their coursework and other courses, fields of study or their future careers, it can stimulate them to see how valuable the subject might be. Instructors can be intentional in providing rationales for why learning a particular topic might be useful and connecting students' interest to the course content.

4. Encourage ownership of learning.

When students struggle, they sometimes blame circumstances beyond their control, such as believing their instructor to have unrealistic standards. When students believe they are responsible for their own learning, they are less likely to cheat. Encouraging

students to take ownership over their learning and put in the required effort can decrease academic dishonesty. Also, providing meaningful choices can help students feel they are in charge of their own learning journey, rather than being told what to do.

#### 5. Build confidence.

When students believe they can succeed in their coursework, cheating decreases. When students do not believe they will succeed, a teaching approach called scaffolding can be used. Essentially, the scaffolding approach involves assigning tasks that match the students' ability level and gradually increase in difficulty. This progression slowly builds students' confidence to take on new challenges. And when students feel confident to learn, they are willing to put in more effort in school [6].

It is clear that these motivational strategies are not the cure-all to cheating. But they are worth considering – along with other strategies – to fight against academic dishonesty.

It should be emphasized that online university courses may not be able to replicate the experience of on-campus social life. But in terms of teaching, well-designed online learning can be more satisfactory than sitting in a large lecture theatre.

Here are five ways online learning can outperform traditional university teaching.

#### 1. Accessibility

Online learning is free from a range of physical restrictions that impede face-to-face teaching. Students and lecturers with certain physical and health conditions often find online learning more accessible than campus-based activities. It provides not only an opportunity to acquire new knowledge but also an opportunity to meet and socialise with other students, which is otherwise unavailable. For many students with travel difficulties and social responsibilities, online learning may be the only option. It can open up educational opportunities to a bigger group of international students. Well-produced learning content such as recorded lectures can enhance the ease of learning – particularly for students who, for whatever reason, may find it difficult to pick up new information in real time from one-off lectures.

#### 2. Personalisation

Students enter university with diverse backgrounds, prior knowledge and experiences, and they learn at different speeds. However, in large lecture theatres, it is extremely difficult to customise the difficulty of lecture content for varying student needs. Instead, teachers may assign independent tasks that need to be completed between weekly lectures and hope that lower-level students can catch up. In online courses, however, it is possible to present multiple learning paths with different sets of resources and activities, allowing students to choose their own learning content and pace. A brief self-assessment to help students better understand their readiness for the subject and choose the best option can be a great start to online learning. Such flexible learning experiences can greatly improve student satisfaction.

#### 3. Clarity

Clarity is at the heart of well-designed online learning. Every single idea and task, large or small, is explicitly and repeatedly explained in online settings. Students pause, reflect and repeat until they understand. Although we often assume that face-to-face communication is more effective, numerous ideas, rules and details are left unspoken

and misunderstood. Teachers are often hurried to finish lectures, mistakenly perceiving a couple of students nodding as a sign of class consent, and confused students are too embarrassed to ask for clarification.

#### 4. Flexibility

Online learning offers the opportunity to change the traditional pattern of university study. Rigidly scheduled weekly lectures can be replaced by group project work or intensive tutorials. The size and attendance requirements of sessions can be varied according to their purpose. This means that students will have diverse learning experiences which may be more challenging and stimulating than face-to-face lectures with little variation. Lecturers can be creative when designing modules and arranging activities, without worrying about room availability and a fixed timetable. There are various ways for students to interact academically in online modules. These range from class discussions to peer review exercises and small group project-based learning. Students can feel supported by structured peer-to-peer activities and develop a strong sense of community online.

#### 5. Independence

The shift from face-to-face “teaching” to online “learning”, suggests it is ultimately students who need to regulate and direct their learning. It is important to note that many students may find it challenging. They can go through a painful trial-and-error process until they establish the right habits and routines, working in their unique learning situations. But they obtain invaluable life-long learning skills and attitudes through this process [7].

To summarize, success in online learning offers a profound sense of achievement. Although it may be difficult for teachers to let the control go in the first place, they are often amazed by how active students can be in their learning. Students as a group also find creative ways to overcome virtual restrictions and achieve beyond what is intended and imagined.

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