

## Online learning and the school closures

Good afternoon and thank you for allowing me the time to speak about the impact of the school closures and the importance of high-quality online education. Approximately one year ago all schools in Europa were closed to stop the spread of the covid-19 virus. The school closures affected around 1.5 billion learners of all ages, which is about 90% of all the enrolled students in the world (Unesco 2020a, 2020b). By mid-May most students had lost 30 days of learning. Education was not prepared for the challenges that the school closure presented (e.g. Bozkurt & Sharma, 2020). There were no protocols, no guidelines and no previous experiences to build on. As a consequence, there were many differences between countries, between districts, between the schools within districts, and even within schools with regards to online education. Probably the only one thing that all schools did the same was cover their windows with A3-size paper telling the children they were missed. And in many cases this feeling was mutual.

Quickly after the schools and universities were closed research reports were published raising concerns about the effects of the closure (e.g. Onderwijsraad, 2020). These concerns were mostly focused on pupils in primary and secondary education and were mainly based on the research on the so-called summer slide. Research indicates that during the summer holiday learning stops to progress (e.g. Cooper, Charlton, Lindsay, & Greathouse, 1996). More importantly, the summer holiday has a differential effect on students from different social backgrounds. The holiday has a larger negative effect on disadvantaged students. At the beginning of the new school year, some have lost a third of the learning from the previous year. Such findings exemplify the need for high-quality online learning during school closures. A well conducted study by McKinsey and Company (2020) was even able to quantify the importance of remote teaching. They modelled the effects of the length of the school closure and the quality of remote teaching on the learning loss. In the scenario in which pupils would return to school in January 2021 and receive average quality remote teaching, the overall learning loss would be 6.8 months. For the children from parents with low income, however, the learning loss would be 12.4 months. The message is clear: high-quality remote teaching is needed, and lots of it.

How did students spend their time during the school closures? German researchers asked more than a thousand parents how their children spend their days (Grewenig, Lergetporer, Werner, Woessman, & Zierow, 2020). In the results they differentiated between high and low achievers. Results indicate that learning time has been cut by half. Instead of spending 7.5 hours a day on school, children spent less

than 4 hours a day on school during the school closure. But perhaps they have spent their free time on other activities that are conducive to learning. The results do indeed show that low and high achievers did spend a bit more time on such activities (e.g. reading, physical exercise), approximately a half hour a day. But they have spent a lot more time on detrimental activities, such as social media, gaming, watching tv, and online media. On average, the low achievers have spent 6.3 hours a day on detrimental activities during the school closure. Importantly and consistent with the previous results are the differences between high and low achievers. Low achievers lost more learning time and have spent more time on detrimental activities. So again, students need high-quality remote teaching, and lots of it.

Unfortunately, in general, education was unable to provide high-quality online learning during the first lockdown. It was at best emergency remote teaching (Bozkurt & Sharma, 2020). The findings from the studies on the impact of the school closure should therefore not come as a surprise. Engzell, Frey and Verhagen (2020) compared the results from the Covid-19 cohort with previous cohorts on language and math. The average learning loss of the students in primary schools was about 2 months, but children with low socio-economic status had 55% more learning loss than the children with high socio-economic status. Others studies find similar results (e.g. Henrichs, Hornstra, Polderdijk & Schuurman, 2020; Maldonado & DeWitte, 2020). In the UK more than a thousand teachers were asked about the impact of the school closure (Sharp, Nelson, Lucas, Julius, McCrone, & Sims, 2020). More than 50% of the teachers estimated that pupils from the least deprived primary and secondary schools have a learning loss of one to two months. Pupils from the most deprived schools, however, have four to six months learning loss, according to more than 50% of the teachers.

The societal impact of the school closures is enormous. Hanushek and Woessman calculated the impact of the learning loss on the gross domestic product (GDP). In 2019 Germany had a GDP of 4500 billion dollars. The costs of a school closure that would last one third of a year is 3087 billion dollar. This is a mind-blowing large number that again emphasizes the need for high-quality online teaching. But the question of course is: what is high-quality online teaching? And in addition: can online teaching be equally or more effective than face-to-face teaching?

Let's start with the last question. How effective is online teaching in comparison to face-to-face education? Multiple reviews have been conducted and many of them statistically integrated the effectsizes of the independent studies by means of a meta-analysis. Here is an example of such a meta-analysis. Means, Toyama, Murphy and Baki (2013) integrated studies that compared the effectiveness of

online learning to face-to-face learning and found a mean effect-size of  $g = +0.05$ . This is considered to be a small effect, and it was not statistically significant. Therefore, the conclusion is that online and face-to-face learning are equally effective. This result is found by many other reviews as well (e.g. Siemens, Gašević, & Daswon, 2015). But they were also interested in hybrid forms of learning, more specifically: blended learning. They found a  $g$  of  $+0.35$ , which is considered to be an effect-size of practical significance, and it was also a statistically significant result. This means that blended learning is more effective than online learning and also more effective than face-to-face teaching. So let us restate the previously mentioned one-liner: we need high-quality blended learning, and lots of it.

Now for the most important question: what is high-quality blended learning? And what are the preconditions for high-quality blended learning? Many reviews have been published on this topic. Most of these reviews focused on higher education, adult education and K12 and integrated studies that have been published after the year 2000 (e.g. Siemens, Gašević, & Daswon, 2015). What does this research tell us?

First of all, the reviews accentuate the importance of institutional adoption of blended learning. Institutions need a solid technology infrastructure and clear policies on blended learning. Moreover, the implementation of blended learning must be carefully coordinated. The role of management is also important, as the introduction of technology requires innovation and change. In addition, there should be technological and pedagogical support for teaching staff.

Blended learning also requires a lot from instructors/teachers. Teachers attitudes towards blended learning and new technologies have an impact on the effectiveness, but the most important factor is teachers ability to meaningfully integrate technology into the learning process. The development of the so-called technological pedagogical content knowledge (TPACK) is of great importance. This accentuates the need for professional development and the allocation of time dedicated to collaboratively design blended learning.

Many reviews also point to the need for high-quality learning materials that are tailored to students' abilities and needs. Do the learning materials really challenge the students? Are the assignments truly aimed at the so-called zone of proximal development? In addition to the quality of content, multiple factors of the educational design are shown to influence the effectiveness. The most important ones are enabling collaborative learning/small group interactions, planning and designing various ways of

interaction, formative assessment, adjusting the course to learners needs, the use of a learning management system, and media that supports the learning process.

The final part of the model is of course the learner. Reviews conclude that learners with high digital literacy, who are intrinsically motivated and able to regulate their learning behaviors, learn more from blended learning experiences. However, this does not mean that blended learning is only suitable for students who already possess these qualities. The important and complex question is: how can we develop these qualities within blended learning courses? How can the design and teaching practice systematically stimulate motivation and self-regulation?

In conclusion, the results from the studies on the school closures made it clear that students' need high-quality online and blended learning. Although significant progress has been made this last year, there is still a long way to go. Conferences like these that stimulate interregional and international collaboration are important for making progress. Let us hope that next time we can meet face-to-face instead of online. Then we would have a perfect, effective blend. Thank you for your time and attention. I wish you all a nice and stimulating day.

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