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“Emergency Distance Education” Model: How Normal Could The Projected New Normal Be?

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Abstract. In this opinion piece, the authors critically consider the transition to the ‘emergency model’ of distance education (DE), forced by the pandemic and associated restrictions to our daily life, paying special attention to its potential pitfalls. The authors argue in favour of more careful approach to DE design and implementation over the ‘one size fits all’ solution. The data from previous meta-analyses in the field of DE and technology integration in education are briefly summarized to provide research-based support for the following observations: (1) students’ academic achievements in DE are largely associated with the interactivity factor, which is also instrumental in preventing excessive drop-out rates; (2) the flexibility factor that largely predetermined the initial rise and rapid proliferation of DE should be maintained to avoid negative side-effects, including student’ dissatisfaction and drop-out; (3) pedagogical factors, imbedded in careful instructional design, outweigh technological affordances, especially since the latter require properly organized and managed infrastructure, adequate training for teachers and students, and sufficient time to be efficiently adopted in formal education to reveal its potential for successful teaching and learning; (4) vast variability of meta-analytical findings, even with the most favourable to DE average point estimates, do not only present educational system with pleasing promises, but also call for serious caution as the negative effect sizes are almost equally prevalent as the positive ones. In conclusion, the paper reminds educational practitioners and policy makers: what comes to life out of necessity does not necessarily present viable solutions in the long run.

1 Introduction

“The world after the pandemic will never be the same”.

Since the beginning of the COVID-19 pandemic in early 2020, people all around the globe, and especially in North America have been hearing this ‘prophecy’ from a multitude of mass-media on a regular basis. Simple and natural safety concerns would prevent us from fully returning to the old routines, even when the virus is defeated. In anticipation of future potential health crises we should remain smart and vigilant.

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As this is written, we have marked one year since the initial announcement of a two-week shut-down, and all accompanied extraordinary measures aimed to mitigate the deadly effects of the virus and to slow down and eventually stop its spread. Today, we know much better a lot of things about the virus itself, reliability of testing, promising therapeutics for treating the disease, relative success/failure of mask wearing, lockdowns and travel restrictions, social distancing, etc., as well as about the legitimate concerns regarding detrimental side effects of these preventive measures on economy, mental health and other aspects of well-being, including elevated risk of drug abuse [1-2] and domestic violence [3-5], increase in number of suicides [6-7], delayed or cancelled treatments of other illnesses with no exception for non-elective surgeries and chemotherapy for cancer patients [8-9]. All these issues warrant serious reflection and balanced non-politicized discussion but lie outside the scope and subject matter of this paper. Our major concern here is with public education: how its various ‘emergency models’, forced on us by the pandemic, could be transformed into what far too many among policy-makers, educational practitioners and even the general public far too often refer to as a *new normal*.

The prophecy with which we opened this piece, has managed to become almost a truism in just a matter of months as nearly everybody repeated it without bothering to explain what exact changes are to be expected in this so-called *new normal*. Despite the ubiquity of these emerging claims, it is likely that many have completely different visions for the future. Further, those espousing this new wisdom may have forgotten other more famous, better justified and verified by time maxims: “You cannot step into the same river twice” (Heraclitus) and “The more things change the more they stay the same” (Jean-Baptiste Alphonse Karr), especially when it comes to human nature. Of course, changes will happen, but they will hardly transform our lives to the extent some mass media sources are predicting and even encouraging. Leaving speculations on the irreversibly changed world of the post-pandemic future to journalists, political commentators, and other categories of professional fortuneteller, we intend only to speak to the matters we know something about, namely to the issue of distance education (DE).

In 2004 our team produced a meta-analysis on the effectiveness of DE that would become the most cited on the topic [10]. For the purposes of this meta-analysis we adopted the definition of DE first articulated by Keegan [11]:

(a) the quasi-permanent separation of teacher and learner, (b) the influence of an educational organization in planning, preparation, and provision of student support, (c) the use of technical media, (d) the provision of two-way communication, and (e) the quasi-permanent absence of learning groups.

Let us continue to use this definition as it emphasizes the most “distance” component of “separation” so relevant to the current situation: to stay safe, we need to separate students, from teachers and from one another. We will address the issue of the effectiveness of such “DE” later in the paper, meanwhile, to begin with, let’s focus on two arguments in its favor: (1) necessity, and (2) feasibility.

2 Necessity

It is quite difficult to objectively measure the necessity of DE, partly because it does not have a single source. Calls for a wider application of DE practices were coming long before this pandemic arrived, originating from other areas of public education, such as refugee education [12-13] and home schooling [14-15]. It might not have been loud enough to be heard and responded to on the same scale as the current health crisis, but it has existed in various contexts for quite some time. This call did not resonate as much then because, in comparison with the current push for DE today, it was coming to address specific necessities and, as such, could not be answered with a ‘one size fits all’ type of response.

Properly addressing individual DE purposes would require policy makers, administrators, and educational practitioners to design and implement instructional interventions tailored to meet the exact needs of very specific groups of diverse learners.

For instance, the necessity to use DE (most often equated now with online teaching) to bring the expertise of professional educators to refugees, displaced, isolated and often deprived of even basic needs, does exist [16-17]. The necessity to provide more online resources in support of parents who have opted out of formal school-based education in favor of home schooling does exist [18-19]. DE was also useful for handicapped individuals, working people seeking to upgrade their education, and other groups of people who for various reasons could not easily attend face-to-face courses. As an example, consider some of the earlier, free of charge experiments by Coursera – lectures offered by top scientists from leading higher education institutions in their respective fields of knowledge (at some point, unfortunately, they became overpriced, and hence, unaffordable to the vast majority of potential students). What unites all these cases of DE is their specific, even unique needs, that require careful research and subsequent evidence-based educational interventions designed and implemented to meet these needs, as well as targeted investment and reliable infrastructure in support of selected pedagogical frameworks and professional development for teachers. What else do they have in common? Unlike the ‘pandemic-inspired’ emergency DE, policy makers, administrators, researchers, and educational practitioners have not had to rush to address them with ‘one size fits all’ blanket solutions.

Frankly, we do not feel qualified to carry out assessing the actual *necessity* for DE that originated from the current pandemic any further. Suffice to say that maintaining any targeted approach beyond the period of the most damaging onset of the pandemic, presumably, would require resources simply unavailable to most of the educational systems in the world. In our opinion, the actuality of the slogan “stay home – safe lives” has been passed long time ago. However, in this regard, we have to trust the opinions of professional epidemiologists and other experts, though their advice to the governments around the world (e.g., imposing various degrees of “lockdowns”) has been hardly unequivocal and notably inconsistent over time. Let us now consider the issue of feasibility.

3 Feasibility

Under the pandemic-imposed lockdowns/quarantines, teaching and learning at a distance has rapidly become a new reality. Many universities are transforming some or all of their courses into online versions. Of concern is whether administrators will see this shift as undeniable proof of feasibility (even inevitability) of a nearly complete shift to DE that is accompanied by a welcome bonus of potential cost savings.

ICT companies adapt and promote existing platforms and develop new tools and applications for DE, reassuring the public that nothing is beyond the reach of modern technology. They collect huge profits from all levels of government by promising uninterrupted services, secure channels of boosted capacity, user-friendly, easy-to-learn, highly interactive interfaces, and, perhaps most importantly, artificial intelligence solutions for nearly every task and activity that in the “pre-virus era” had to be entrusted to unevenly reliable human employees.

There are, no doubt, some who would see in the current situation an opportunity not to be wasted and evidence that the transition to DE is both quite viable and highly beneficial. In this paper we intend to argue that the lesson to be learned may be exactly the opposite – the current situation presents us with an enormous challenge to thoughtfully (even skeptically) respond to, not an opportunity to rashly embrace a *new normal*. Everything we

observe through the lens of the current health crisis only emphasizes the multifaceted problems of a large-scale transition to DE.

To make this point, two types of arguments will be used: (1) practical concerns and considerations (simple common sense) and (2) accumulated research evidence.

4 Practical arguments

Remember: ‘the more things change the more they stay the same. Research in education has accumulated many studies on the so-called “digital divide” when it comes to access and use of technology [20-21], for example based on differences in socio-economic status, gender, etc. Our own systematic reviews and meta-analyses [22] showed that, after decades of attention to the issue and efforts to overcome various stereotypes, with many setbacks along the way, the gender gap is finally starting to close. Whereas there are still small, but statistically significant differences between male and female students in general attitudes toward information and communication technology (ICT), confidence in dealing with it and its perceived usefulness, the difference in actual use of ICT for learning was found to be virtually non-existent $g^+ = 0.048$ ($p = 0.054$). However within the framework of the emergency model of DE, with its ubiquitous reliance on technology, there is a serious concern that, without careful consideration and planning, the gap may reopen wide, as female students could easily succumb to the old stereotype that they do not possess the same abilities and confidence to handle ICT as their male counterparts.

The inequality issue does not stop with gender. Students’ access to ICT and online resources and their level of comfort dealing with them varies substantially. Traditional educational models, for better or worse, must (and did) make genuine efforts to adjust to this reality and level the field for many. Conventional educational settings (schools and universities alike), by and large, accommodate all categories and types of students: those that are not equal in SES, access to financial and technological resources, cultural backgrounds, family structure and dynamics, motivation, expectations, etc. There are libraries, atriums, auditoriums (outside of scheduled class hours), even outdoor spaces with Internet connections, where students can study individually and/or in groups at their convenience. Where should a student, for instance, living in a two-bedroom apartment with parents and siblings of different ages attend online classes and prepare for them and subsequent exams when all learning activities are at a distance?

In regular educational settings computers are available to students in libraries, computer labs and other designated areas, so that many students limit their personal technological equipment to the latest iPhone model or use one stationary household computer in turn with other family members. Who would pay for personal (literally personal – one per person) computers for all students? Who, and by what means, can provide unlimited high-speed broadband Internet access to all learners across age/grade levels and geographic locations?

Decades of experience have led to the current modes of administering exams that balance rigorous assurance of integrity, fairness, and respect for both students and instructors. What solutions have been proposed so far to replace them under the emergency DE model? Out of the whole range of solutions, we have learned about so far, let us name just a few examples.

In early April one Canadian university, because of the transition to the emergency DE introduced a ‘pass-fail’ system of course grading to ease potential pressure on students. While well intentioned, and perhaps even a viable short-term option within certain fields, this solution warrants some important questions. What about students in highly competitive programs dedicated to advancing their academic careers and finding the best possible employment as a result? Are they supposed to put on their CVs and job applications a statement that, due to the pandemic in the middle of their education, the A+ in their most

critical course, that they worked so hard for, turned into a mere ‘pass’? That is not to mention that the very motivation to work toward an A+ may dissipate under this new grading system. In contrast, many schools, colleges, and universities around the world (based on word of mouth from colleagues across North America, in the Middle East, in Russia, etc.) are adopting ‘proctored’ online examinations with multiple cameras monitoring students’ every single move (including eye movement tracking). This invasive and monitored environment cannot help but add even more stress and distraction to exam taking. Students, already paying large sums for their higher education despite losing access to university resources and social supports, are also forced to choose between bad options when it comes to their grades – no frustration and numerous mediocre ‘passes’ on a transcript or a solid competitive academic record after repeated privacy-invading sessions where one needs to convince advanced AI-based technology that they are not a cheat if they fidget too much.

What does course participation look like in the *new normal*? Before it was common for many instructors to reserve a portion of the final course grade for attendance and/or participation. What would constitute ‘active participation’ in online classes and how is it supposed to be evaluated under the emergency DE, many educational institutions are so eager to embrace? Further to the issue of participation, how many students are at risk of disappointment by being deprived of direct contact with teachers and peers? Having paid substantial tuition fees for, among other things, access to all on-campus facilities, they could demand this money back (some actually have), not to mention that, instead of thinking of how to compensate students’ unmet expectations, many universities have moved in the other direction. Canadian universities, for instance, have already announced increase in tuition fees by 3-10% [23-24].

Before turning to the arguments based on research evidence, we would like to ask all stakeholders to seriously and sensibly consider both the real strengths and even more real weaknesses of this hastily conceived new model of education. Omnibus DE is not a solution, only carefully designed and implemented DE can be. We must be wary that education, which has often been considered the ‘great equalizer’, does not become the ‘great divider’ under this new emergency model.

5 Available research evidence

1. Bernard et al. [10]: Synchronous vs. asynchronous DE – when flexibility is taken away “distance” becomes a disruptive quality.

By the standards of our rapidly changing world, it was a long time ago, back in 2004, when our research team published a large-scale meta-analysis of the effectiveness of DE, and since then it has become the most cited systematic review in the field. Among its many findings, there is one that we would like to refer to in connection with the current situation. We found that the overall weighted average effect size of $g^+ = 0.013$ ($k = 318$, $N = 54,775$), for achievement outcomes, was statistically non-significant (virtually indistinguishable from zero). What this suggests is that DE in general can be as effective (or no less effective) than traditional in-class instruction. However, when the collection was split into *Synchronous* (i.e., a live stream course and/or chat) and *Asynchronous* modes of DE (i.e., an online hub with posted content and/or discussion forum), the picture that emerged was dramatically different. Both respective effects were still small in magnitude, but pointed in different directions, each achieving the level of statistical significance. Specifically, whereas the latter sub-collection produced the effect size of $g^+ = 0.053$ ($k = 174$, $N = 36,531$, $p < .05$), the former resulted in a negative point estimate of $g^+ = -0.102$ ($k = 92$, $N = 8,677$, $p < .05$).

Without getting into too much detail, suffice it to say that the primary applied meaning of this split is in the emphasis on the flexible nature of the DE as its most potent advantage (i.e., the ability for students to overcome the restriction of having to be in a particular place at a particular time). With *Synchronous* DE, this advantage is lost, while technical challenges and the lack of contact with the teacher and classmates persist, hence the negative effect is likely. *Asynchronous* DE is entirely different – content delivery and learning activities are not tied together within the timeframe and physical boundaries of one class (even virtual) but can be spread in time and attended by students at their best convenience – presumably, flexibility results in a positive effect on academic achievements. To an extent, this is a simplified discussion of the findings from 2004, but we have focused on what really matters in the context of the current situation to prompt the question – is the current emergency model of DE more *Asynchronous* or *Synchronous*? Our research suggests that over-reliance on live Zoom classes, so popular an option during the past year, may negatively impact student performance unless carefully paired with other online and/or blended learning (BL) options and activities.

Some (including members of our own team) would reasonably call for cautious interpretation of this history— after all, educational technologies used to offer DE then and now are very different, more reliable, more interactive, more multifunctional. Nevertheless, the main argument remains – learners are likely to benefit from DE that offers them some degree of flexibility and ability to revisit course materials. That is not to mention the “choice” factor. Are students not supposed to have some say in what mode of study to choose, when, and for what purposes? The latter question was in part answered by the same Bernard et al. [10] piece, repeatedly echoed by others [25-27]: DE mode showed much higher attrition rates (i.e., percentage of students who could not or did not want to finish the course) than it was in regular face-to-face instructional formats.

2. Bernard et al. [28] & Borokhovski et al. [29]: Interaction is the key component of DE, especially ‘*designed interaction treatments*’...

Later, while continuing the same line of inquiry, we conducted another meta-analysis to address a question of comparative effectiveness of different modes of DE [28]. The major challenge in conceiving and implementing it was to decide on the experimental and control conditions across all included studies, consistently. The solution came in the form of several conceptual hypotheses formulated by Anderson [30] about the combined effect of at least two types of interactions in DE [31]. Our meta-analysis did confirm this hypothesis. Not only did more interactive DE instructional interventions produce positive effects on learning, DE conditions that combined higher levels of interactivity of two out of three types, identified by Moore, outperformed other (less interactive) forms of DE. Especially strong were effects of DE interventions (adjusted for studies’ methodological quality) that combined *Student-Content* interactions with either *Student-Student* or *Student-Teacher* interactions: $g^+ = 0.48$ ($k = 29$) and $g^+ = 0.49$ ($k = 38$), respectively. Considering that DE in general offers some degree of flexibility, the added value could only come from the higher degree of interactivity that in regular classrooms exists nearly by default, but presents a serious challenge to be achieved at a distance.

Moreover, in a follow-up meta-analysis [29], it was clearly shown that *designed interaction treatments* (i.e., those instructional interventions that were pre-planned and implemented to enable, facilitate and promote interactions among learners) significantly outperformed *contextual interaction treatments* (i.e., instructional interventions, still quite high in interactions, but only because the technology involved in delivering DE allowed for it, and not due to any particular pedagogical choices): $g^+ = 0.50$ ($k = 14$) vs. $g^+ = 0.22$ ($k = 22$). The difference was statistically significant ($Q_{Between} = 6.37, p = .01$). Here is yet another question we have to ask: To what extent is the current emergency model of DE interactive? Many professors, for instance, have taken to pre-recording lectures and posting them to

online courseware for viewing by their students - while this improves flexibility, interactivity is removed. The importance of the interactivity factor was once again pointed out to at the very beginning of the pandemic by Hodges et al. [32].

3. When ES regressed against the date of study, nearly flat regression line results [33-34]. Another observation we have consistently been making through several meta-analyses is related to the “great technology debate” [35-37]. Where McLuhan famously argued that the medium is the message (i.e. that the message conveyed is changed by the medium with which it is delivered), Clark made the opposite case, comparing educational technology to a grocery delivery truck (i.e. a neutral carrier that did not affect the message). One counterargument to Clark’s metaphor has been that it did not take into account the very rapid development of technology. Indeed, technology with time has become more sophisticated, interactive and multifunctional and continues to develop further, providing both teachers and students with more and more options for supporting and enhancing learning. Nearly every three to five years (if not faster), some new form of technology comes into play and captures the attention of the general public and dedicated enthusiasts within the educational community, who create and propagate new agendas for adopting it. So, we just recently went through the eras of Internet-based tutorials [38-39], one-on-one laptop programs [40-41], ‘serious educational games’ [42-45], smart mobile devices and applications [46-47], and now are living through yet another incarnation of technological fashion – ‘artificial intelligence’ [48]. All these tools have proven to be somewhat promising and successful – some in our team have participated in summarizing the impact on learning of at least two types– computer simulations for science education [49] and tablet use in schools [34]. However, is the progress in the advancement of educational technologies accompanied by equal advancements in educational practices, specifically as it could be reflected in students’ academic achievements?

A large-scale meta-analysis of effectiveness of classroom technology integration in postsecondary education that covered two decades of empirical research (1990 – 2010), resulted in an overall weighted average effect size of $g^+ = 0.27$ ($k = 879$, $p < .05$), also observed a nearly flat regression line (effect sizes regressed against the corresponding years of publication): $b_Y = 0.004$, $p = .27$, $Q_{Regression} = 1.22$ [33]. An almost identical picture was observed in its follow-up – a meta-analysis of blended learning [33]: $b_Y = 0.00$ ($p = .41$, $Q_{Regression} = 1.0$) and in a meta-analysis of use of tablet-like devices for educational purposes [34]: $b_Y = 0.024$ ($p = .20$, $Q_{Regression} = 1.67$) – for the ‘tablet use vs. no tablet’ comparison type and $b_Y = -0.001$ ($p = .99$, $Q_{Regression} = 0.00$) – for the ‘pedagogically enhanced tablet use vs. tablet use alone’ comparison type. Basically, this means that, though there are positive effects of educational technology use, they do not change over time, despite the most impressive advancements in technology itself. There is always a lag, presumably needed for teachers and institutional infrastructure to pick up speed to achieve some reasonable level of effectiveness, and by the time it is attained, new technological wonders appear, catch everybody’s attention, and the whole applied circle repeats itself. Here is another not inconsequential question. Under the emergency transition circumstances, do teachers have the time, resources, and simple human capacity to learn how to most efficiently deal with even the most advanced and user-friendly technology for DE? Our evidence suggests that several generations of educators before them could not meet the challenge beyond decent, but not overly impressive effects of around $0.3SD$ – regardless of whether they were dealing with PowerPoint presentations in the mid-1990s or smart mobile devices in the 2010s.

4. Heterogeneity of findings persists in all of the above-mentioned meta-analyses – there are always a lot of studies on the negative (often of high magnitude negative) side of the distributions, as well as on its positive side.

There is one more fact to consider. In nearly every single meta-analysis conducted by educational researchers during the past three to four decades (our own and numerous others that have come to our attention), the distribution of individual independent effect sizes (at least, with respect to academic achievements) is always significantly heterogeneous. In other words, there are always considerable negative effects indicating that the control condition (whether it is a face-to-face alternative to DE or technology-free as the opposite to technology-saturated instruction) substantially outperforms the experimental one.

In a typical meta-analysis, to sort out such cases (understand, explain, and suggest an applied remedy), the analysis of moderator variables is used. This kind of analysis may determine under what particular conditions an experimental treatment may not only be ineffective, but actually hurtful to learners (for example, it could be a specific age/academic level, subject matter, or treatment duration, etc.), but for the purposes of this paper we are not going to discuss these particularities of different meta-analyses – either our own or those conducted by fellow researchers. The focal point here is that a ‘one-size-fits-all’ approach never works – there are striking exceptions from even the most successful educational practices.

As educational researchers, one of our paramount responsibilities is to identify and counteract the most unhelpful circumstances and their negative effects on learning, as well as to promote the most promising ones. In other words, educational researchers strive to assist policymakers, administrators, and front-line practitioners (teachers, first and foremost) to make the best-informed decisions for their school/class context. Can this task really be accomplished under the emergency DE paradigm, necessarily applied in haste in response to an unforeseen crisis? And should we not pause now, one year in, and consider the evidence we can now gather before simply embracing this as the so-called *new normal*? While necessity may indeed be the mother of invention, we should not rush to make decisions made under duress and the pressure of time into a new service paradigm for all formal education. Instead, we should take this opportunity to investigate and research the effects of this rapid change on student outcomes, and then make decisions based on the weight of evidence accrued during the unique social experiment prompted by the pandemic. After all, what comes to life out of necessity does not necessarily present the most viable solution in the long run – the current emergency DE model is not an exception.

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