Is online education a good alternative to traditional school-based education?

Research Proposal

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Working title: Is online education a good alternative to traditional school-based education?

Preliminary literature review

Online education is related to the Sustainable Development Goals because online education implies lower carbon emissions than traditional school-based education, due to the reduction in travel in online schooling. As Yin et al. (2022) show, in their analysis of carbon dioxide emissions across China, in the context of the COVID-19 pandemic, carbon dioxide emissions were significantly reduced due to the reductions in electricity consumption in schools, and the transportation of school students to and from school. One of the main environmental benefits of online education is, therefore, the reduction in carbon emissions that online learning enables. Shifting to online education would, therefore, enable the Sustainable Development Goals to be met.

Regarding the effectiveness of online education *vs.* school-based education, the evidence base offers conflicting results regarding the effectiveness of online education *vs.* school-based education (Panigrahi et al., 2018). Jung and Rha (2000) studied the effectiveness and cost-effectiveness of online education, finding that in many cases, online education is as effective as traditional school-based education in terms of learning outcomes and that there is no superiority of either form of education (school-based *vs.* online) which suggests that online education is a viable alternative to school-based education. Indeed, Daugherty and Funke (1998) found that online education can be more effective in certain subjects, including mathematics and physics which require the solving of complicated problems.

Other studies have, however, shown that whilst online education can be effective, it is inefficient (Basar er al., 2021). This is mainly because, for courses that are 100% online, school students can lack motivation for learning (Harandi, 2015) which can make the learning process inefficient (Bulic and Bulic, 2020). This is thought to be because, for school-aged children, learning has a large social component (Keppens and Spruyt, 2017) which is obviously absent during online learning (Michailidis et al., 2022).

Recent research has, for example, shown that online learning is less effective than face-to-face learning (Almahaseees et al., 2021) but that online learning has various benefits, including lower cost, higher levels of convenience (because timetables can be moulded to the student's needs) and higher levels of flexibility. Overall, then, the research suggests that whilst online learning was a necessary and viable alternative for education for school-aged children during the COVID-19 pandemic, online education could never fully substitute face-to-face learning (Cooke, 2020), especially not for certain subjects that have an experimental component and require face-to-face interactions, including science (Hong et al., 2021).

Stephen et al. (2019) show that online learning is not as effective as school-based learning for school-aged students: students have lower achievement, due to poorer performance, in online learning settings, across a variety of subjects. In fact, it is estimated that during the COVID-19 pandemic, and the resulting transition to online learning during the lockdowns, that school-aged children (particularly younger children) experienced significant learning loss as a result of the lower effectiveness of online learning (Engzell et al., 2021).

Online education is not the only potential alternative to school-based education because other alternatives to school-based education exist, including e-learning and distance-learning. As Moore et al. (2011) suggest, whilst it is not an easy task to undertake a meaningful cross-study comparison for different types of alternative educational modalities, the research shows that students who are aiming to learn using different modalities all have different expectations of their course and also different perceptions of their chosen learning environment. This means that it is difficult to compare the effectiveness of online learning *vs.* e-learning *vs.* distance learning. The question of which alternative to a school-based education appears, therefore, to be beyond the scope of this research, especially as distance learning (which was traditionally delivered via books sent through the post) has now largely been replaced by online learning modalities.

Regarding the benefits of online education, in terms of mental health and physical health, certain students can benefit from online education including those students who have difficulties within the school system, including students who are bullied at

school and students who might have health issues which prevent them from being able to travel to, or engage with, traditional school-based learning. Other benefits of online learning, for all students, include the flexibility of online courses, the greater amount of free time that online learning offers to students (due to the lack of travel), the increased personalisation of the online learning experience which can cater to both gifted students and students who need more support (Taylor, 2022).

Regarding the challenges of online education that have been identified in the literature, one of the main challenges is the lack of socialisation which is difficult for school-aged children and which poses difficulties both for engagement with the course material and motivation (Chiu, 2021) and children's mental health (Zhou, 2022). Other challenges include technical issues which can interrupt the learning process, poor time management amongst students which can lead to poor performance (and which, in online education settings, cannot be so easily corrected by teachers) and/or a lack of focus if the child has been sat for hours in front of the screen with little physical activity in between classes. It is also important to recognise the dangers of the internet for children (including cyber predators and cyberbullying amongst other dangers) which become more likely if the child is online for longer periods of time, for example doing homework alone, online, after a full day of online classes (World Economic Forum, 2020).

Online education also has certain limitations including difficulties in delivering physical education classes and difficulties in developing and maintaining personal relationships, particularly group-based friendships that school-aged children tend to form whilst undertaking school-based learning (Mukhtar et al., 2020). These limitations of online learning can lead to difficulties in children's socialisation processes which can lead to a sense of isolation and loneliness which can, in turn, lead to mental health issues amongst children exposed to long periods of online learning (Zhou, 2022).

There are, of course, possible solutions for the limitations of online education including engaging in periods of physical education during extracurricular activities in the real world, for example going to a park after online classes, joining a sports club or joining a sports team, but these can tend to feel forced and inauthentic for children

which means that such activities cannot replace the valuable social contact that children experience whilst undertaking school-based learning (Coulter et al., 2021).

Research questions/aims

The preliminary research questions that have emerged from the preliminary literature review are:

1. Is online education more beneficial than traditional school-based education?
2. Is online education the solution for zero/low-carbon education?
3. Is online education a better alternative to other non-school-based options for school-aged children?

Research method

The literature review method will be used to collect the information for the research. The literature review methodology is a valuable approach to collecting information for research projects which allows the identification, collection, compilation and assessment of existing literature on a particular topic (Hart, 2005). This allows a rich understanding of the research topic and, as Hart (2018) suggests, enables a flourishing of the research imagination, allowing researchers to build on the existing literature to provide new, original findings which propel the research field forwards.

The literature review will be conducted by brainstorming search words and search terms and then entering these into the selected bibliographic databases (including EBSCO, Web of Science, the Social Science Citation Index, the Social Science Research Network and JSTOR, amongst others).

Each search of each bibliographic database will produce a set of results – papers and articles relevant to the search terms – and these results will then be filtered using inclusion/exclusion criteria which will narrow the search results down to a set of highly relevant papers/articles/conference proceedings. The search results that remain following this selection process will then be read in detail, one by one, and any relevant information from these search results will be used to construct the literature review.

Ethical considerations

There are several major ethical considerations when using a literature review methodology and when constructing a literature review (Hart, 2018). These include researcher bias and plagiarism.

Researcher bias – selectivity – can occur when the researcher introduces a systemic error into the sampling or testing due to a preference for one particular outcome or answer over another (Pannucci and Wilkins, 2011). It will be important to ensure that any personal bias, held by the researcher, does not negatively influence the results obtained from the literature review process so that the research produced is as objective as possible (Hart, 2018).

Plagiarism is, according to the Oxford English Dictionary, the “practice of taking someone else’s work or ideas and passing them off as one’s own”. Failing to ensure originality when writing up research is unethical as it is a form of academic dishonesty (Houghton and Houghton, 2019) and so should be avoided.

Plagiarism is an academic offence and the potential penalties for engaging in plagiarism are extremely high, including being expelled from the University. It is important to avoid plagiarism by ensuring that any information/ideas from another researcher are cited correctly and by ensuring that the literature review is as original as possible, including ideas that are authentically new, even if they are based on existing literature (Houghton and Houghton, 2019).

Timetable

	Weeks							
	1	2	3	4	5	6	7	8
Determining the topic								
Identifying the research questions								
Finalising the proposal								
Gaining approval and feedback								
Systematic search								
Collation of themes and analysis								
Evidence quality check								
Finalising the themes								
Draft dissertation								
Final dissertation								

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