

Coming soon to a device near you: A policy analysis of mandatory online learning

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ABSTRACT

This paper provides analysis of a policy decision to mandate four online secondary school courses in one Canadian province. The critical policy analysis framework employed considers the different contexts within which technology-based policies are enacted, and examines policy elements such as text, actors, and the policy enactment process. The authors also consider policy alternatives and resistance, and ask who benefits or is marginalized by a policy that requires online credits for graduation. Furthermore, the authors examine research related to mandatory online courses, and undertake a detailed examination of the mandatory online learning policy in Ontario, Canada, with special attention to the policy's potential impact on secondary school student populations.

Keywords: Online learning, K-12, Virtual schools, Critical policy analysis

1. INTRODUCTION

In March, 2019, the Province of Ontario, Canada, with approximately 2 million students [1], announced a Kindergarten-to-Grade 12 (K-12) policy agenda with the reported purpose of modernizing classrooms to better prepare students for their futures [2]. The first initiative was a planned expansion of broadband internet connectivity to rural and northern schools. The second was a new requirement that secondary students take at least four internet-based e-learning courses (four of the required 30 credits) in order to earn an Ontario Secondary School Graduation Diploma. The phasing in of the e-learning courses would commence in 2020. Other planks in the policy announcement included restrictions on cell phone use in schools [3] and larger class sizes for secondary schools [2].

The larger class sizes announcement received significant attention. One of the province's teachers' unions, the Ontario Secondary Schools Teachers' Federation (OSSTF), published models of how programs would be affected in secondary schools of different sizes, showing that 25% of full-time equivalent teaching positions would be lost by the 2022-2023 school year, and that half of the schools would lose teachers qualified in "languages, drama, green industries, co-op, computer science and/or technology" [4]. There have been other responses to the e-learning course requirement policy. In July, 2019, a "public voice" on education challenged the government to "explicitly state

the purpose of the policy move" requiring four online courses for graduation, as this decision would impact every secondary school student. They argued that no other educational jurisdiction in North America requires students to pass four e-learning courses for graduation. Younger students and students who are not independent learners could be adversely affected by this policy decision. They saw some positive aspects to online courses but they argued that the government needed to state the purpose of this new policy and engage in consultation, capacity-building, resource-development, and plans for "trouble-shooting" the mandatory online courses requirement [5].

In the sections that follow, we examine research related to mandatory online courses and undertake a detailed analysis of the mandatory online learning policy in Ontario with special attention to the policy's potential impact on secondary school student populations.

2. ONTARIO E-LEARNING K-12

The official policy for K-12 programs in Ontario schools defines *technology in the classroom* in two ways: *blended learning*, where digital learning resources are used in a physical classroom with students and teacher present, and *e-learning*, in Grades 9-12 courses provided in virtual classroom settings, where there is distance between the student(s) and the teacher(s). The distance may be related to geographic location or time, and the e-learning teacher may provide students with face-to-face (f2f) (physically co-located) or online synchronous support [6], [7].

The Ministry of Education is responsible for providing e-learning leadership in the province. School districts are charged with the delivery of e-learning courses and programs, program direction, staffing, student registration, teaching students and granting credits [7]. School districts deliver and administer the online learning programs [8]. The provincial strategy for e-learning involves all publicly-funded school districts and has been guided by a *master user agreement* that outlines various roles and responsibilities [7]. This agreement stipulates that e-learning teachers are qualified Ontario teachers [7]. Student information data tracking in the province is already centralized through a provincial Learning Management System (LMS) and searchable repository of educational resources accessible to all school districts in the province.

Presently, 5.1% of K-12 students in Canada are enrolled in distance and online learning [10], and 8% of post-secondary students in Canada take online courses [11]. In Ontario, a recent *People for Education* survey indicates that

87% of Ontario secondary schools have “at least some students” in e-learning [9, p.32]. Barbour reports that there were between 50,000 and 60,000 Ontario students enrolled in e-learning in 2017-2018 [8]. There were 628,000 secondary school students in Ontario in 2017-2018, indicating that the province needs at least ten times more online learning spaces to meet the new policy direction [8].

3. E-LEARNING K-12 (U.S.)

There are six American states with a single online course graduation requirement: Alabama, Arkansas, Florida, Michigan, New Mexico, and Virginia. Michigan was the first to require one online learning experience (20 hours) in 2006 [8]. Models in the U.S. include virtual schools that are centralized or state-led, but most states now offer multiple programs. Currently there are 478 virtual schools in approximately 40 U.S. states, and Florida reports the highest number of virtual schools at 182 [12]. Almost all virtual schools (350 of them) are administered by their school districts [13]. Idaho has the largest percentage of students in their virtual schools at 2.4% [13]. Virtual education in the U.S. may be offered by full-time public schools that are online, or supplemental state-supported virtual schools where students enroll at their traditional “brick and mortar” schools and take online courses. While attendance in these traditional “brick and mortar” schools relates to geography, attendance in virtual education is based on local or state laws with respect to funding or credentialing [14]. For comparison, the United Kingdom’s approach has been to establish 10 regional broadband program consortia that develop e-classroom materials matched to local (school authority) needs [15].

Michigan: Ontario’s American neighbour state, Michigan, was the first state to mandate online learning for graduation in secondary school [16],[20]. In Michigan, K-12 students must complete 20 online hours to satisfy graduation requirements. These 20 hours may be offered in three different modes: 1) fully-online, semester-long, or trimester-length courses; 2) an online experience of at least 20 hours; or 3) online experiences within a series of required courses [20]. (Note: In Ontario, this would be considered *blended learning*). The mandated online learning in Michigan may be accomplished with peers and teachers in a “brick and mortar” classroom, though online courses must be taught by a qualified *teacher of record* [17], offering opportunities for individual instruction and group collaboration. These online learning experiences must employ multiple communication channels, and require a student-to-teacher ratio that “allows for relationship building” [16]. Michigan’s legislative policy approach is more permissive than it is mandatory. In the U.S., K-12 online learning is offered in part through *virtual schools*, which are state-approved schools that offer secondary school courses through internet-based delivery [18]. Michigan allows parents the right to enroll students in up to 2 virtual courses in a term, with certain conditions that are stipulated in legislation [17].

Course Completion Rates: Key findings about e-learning effectiveness and best practices from the past 15 years are available from Michigan Virtual University [19], which reports that 7% of public school students in Michigan took

at least 1 virtual course in 2017-2018. Most of these courses were provided by local school districts offering virtual courses primarily to supplement their face-to-face course offerings. Almost 600,000 Michigan K-12 students enrolled in virtual courses, and the overall pass rate was 55%. The pass rate for the English course was 51%; for Mathematics, 48%; for Sciences, 52%; and for Social Sciences, 56%. Just less than half of the students (49%) passed all of their online courses [19].

Students in poverty: In Michigan, while students in poverty are the majority of virtual learners (57%), their virtual course pass rate (49%) is significantly lower than that of students not in poverty (69%). What is noteworthy is that students in poverty who were in “brick and mortar” (non-virtual) courses had a 70% pass rate, which is 21% higher than their peers in virtual courses. The pass rates were also higher for students who took fewer virtual courses. Students taking one or two virtual courses had a 76% pass rate compared to students who took five or more courses, with a pass rate of 51% [19].

Challenges online: Michigan reports that, while online courses can give students chances to learn at their own pace, or offer solutions to course shortages, students who struggle in their face-to face courses will similarly struggle in online courses [20]. Students report that online courses are at least *as challenging as, or more challenging than* f2f courses. Students need to develop skills to navigate the online course. They must self-regulate to meet timelines and deadlines, and they need to learn how to gather information, especially if they are not in the same physical space as their teacher and their classmates [20].

Michigan has identified several characteristics of successful online students, including good time management, effective communication, self-motivation, academic readiness, independent study habits, and technological preparedness [20]. Michigan has found that, in general, 75% of students adapt to online learning while 25% do not [21]. One Michigan strategy is to examine best practices from the most successful programs to inform other programs using intentional design. Freidhoff recommends that the focus be on “high touch” (teacher-student interaction) rather than “high-tech” which focuses on the technology [21].

Policy considerations: The U.S. National Education Association [22] has published policy guidelines for quality e-learning. According to this agency, decisions to offer online courses should be based on clear criteria, such as filling gaps in course offerings, assisting underserved students, and enriching the curriculum. Further, the funding for course development and purchase needs to be in place, and enrolment policies are needed as are policies to ensure student access to equipment, software, connections, resources and technical support. Instructors need preparation to teach online and should have ongoing monitoring and evaluation [22]. Students new to e-learning need support to adjust to online, and students have repeatedly indicated that they need to be able to interact with other students and the teacher [15].

Social Presence: Most adolescent learners understand the Internet as a social space. Work environments now have various mediated forms of interaction that substitute for being physically co-located. With the ability to maintain contact across space and time through multimodal means,

today’s learners may be more accustomed to just-in-time, personalized access than to the “distance education” or the a-synchronous courses that were offered in the past. This sense of being co-present with another person in a mediated space has come to be known as *social presence* [23]. A well-established theory of online learning in Canada establishes the need for social presence and teacher presence [24]. Student connection in online courses increases with the use of video and audio, and similar affordances of online learning environments [25].

Critical policy considerations: The U.S. National Education Policy Center maintains that while proponents of virtual schools argue that they expand student choice and make public education more efficient, their claims that online schools can promote greater student individualization and achievement are not supported by the research, though the promise of cost savings makes these schools appealing financially [26]. The average student-teacher ratio in virtual schools is 2.7 times greater (44:1) than the national average in public schools. This agency also reports that “a surprisingly low proportion of virtual and blended schools had performance ratings available” [26, p.90], and while they remain optimistic that school districts can make improvements in online programs, they argue for more research and regulation of online programs in school districts, and recommend that the growth of virtual and blended schools should be slowed or stopped [26].

Equity issues: Recently, concerns have been raised with respect to equity of outcome for online students across racial lines in Ontario’s largest school district [27]. The US National Center for Education statistics finds similarly that there is a higher proportion of students in online courses who are White-Non-Hispanic [26], and that this overrepresentation may be related to the digital divide, and needs further research. Students in lower-income families are also less likely to undertake full time virtual schooling.

Summary: While more is known about U.S. K-12 online education, virtual education is not a novelty in Canada, as it began in 1994-1995 [28] and has grown significantly in recent years. Different expressions used interchangeably in Canada describe online learning (e.g., distance learning, online learning, blended learning, and e-learning). Alberta has a provincial school, the Alberta Distance Learning Center [29] offering online courses establishing policies to allow local school districts to set up stand-alone schools or for local schools to offer online or blended courses. In British Columbia, the online program is called *distributed learning* [30]. While K-12 online learning is not new in Canada, a mandate requiring students to take online courses creates a new policy element that requires further analysis.

4. CRITICAL POLICY ANALYSIS

A critical policy analysis framework examines both the stated policy and related policies, procedures, and implications arising from a policy pronouncement, and raises questions where insufficient information is provided. Using a critical policy analysis framework, we pose several key questions for the designers of Ontario’s mandatory e-learning graduation requirement policy (See Table 1).

Table 1: Critical Policy Analysis (Robertson & Muirhead, 2019)

Policy influencers	Policy text	Policy process	Policy privileges (critical policy analysis)
Assumptions Belief systems, Stance: traditional vs contemporary	Legislation (e.g., Education Act Memos Curriculum) Rhetoric, Discourse News Release	Policy trajectory Policy actors Policy levers Policy contexts Policy responses (non) compliance	Policy history, complexity, implications Policy vacuums/gaps Rhetoric vs reality Policy alternatives and resistance
Who has power and voice in the policy process? Who is missing?	What is the stated public problem that the policy addresses?	What are the intended and unintended repercussions?	What are the assumptions within the policy design? Who benefits/is marginalized?

The requirement for four online courses raises important questions around online course design, pedagogical choices, learning cohort considerations, and potential effects of class size on instructor/teacher workload. Additionally, technological concerns, implementation matters, and instructional design issues abound. For example, the provision of maximum choice of end-user computer-based devices and broadband internet connectivity will need to be addressed equitably. Furthermore, specificity regarding how, when, and what form of online assessment and grading will be implemented, and how the risk of academic misconduct will be addressed, remain unanswered. In addition, the requirement for professional development for both teachers and learners to make maximal benefit from online learning must be considered. Finally, any number of known/anticipated and unknown-unanticipated questions that inevitably arise when implementing significant changes to large, mature systems, such as Ontario’s K-12 education system, need to be considered.

Pedagogy and online course design: In general, the growth of online education has generated a variety of design and instructional methodologies that support online learning. Some online providers follow a continuous enrolment model where students complete courses online throughout the calendar year without set dates. Others follow a traditional academic year. Some courses are available online, with supplementary materials available by post. Others offer courses fully online, and where bandwidth is compromised, CD-ROM technology is used to distribute learning materials to students. In other cases, online courses are offered within a traditional school setting where students enroll in low-demand or low-enrolment specialized courses, and students are supervised by local teachers acting as advisers during the school day. Broadly speaking, online courses employ a variety of synchronous technologies in which students are grouped in traditional class groups and instruction is provided in real

time, utilizing two-way communication between students and teachers. In most cases, instruction is provided via a broadcast methodology where teachers merely “deliver” course materials. In-school online courses employ local advisers to provide supplementary organizational support to students. In other cases, online courses utilize supplementary tutoring from teachers at a distance through weekly online tutorial sessions, while in other jurisdictions, some students take online courses which more closely mimic conventional “correspondence courses” involving little or no interaction with teachers/instructors. While there are many approaches to online course design, courses are created based on personal beliefs, research, student characteristics, and local and provincial infrastructures. Up to the present time, the Ontario Ministry of Education has not provided any information regarding course design, pedagogical design, development and provision of course materials, technological requirements to successfully participate in online courses, or course size and staffing provisions. Critically, policy development requires enabling documentation to allow systems and actors to prepare for change.

Learning Cohort Size: Online courses vary in how they are designed, and their design significantly affects the role and professional practices of teachers. Some online courses take a more traditional approach, and mimic existing high-school courses with similar class sizes and academic staffing. Thus, course sizes follow a face-to-face model and attempt to build on face-to-face teaching practices. Other courses are provided in online settings where class sizes are substantially larger, and where interaction between students and between students and teachers is less frequent. These courses are more akin to traditional distance education courses where an instructor is primarily a “grader”, answering student questions and attending to requests for assistance. As a result, the instructor interacts with more students, though less frequently. An important question arising from the Province of Ontario’s announcement of mandatory online courses is how the province intends on staffing these courses. While an announcement of larger class sizes for traditional classrooms accompanied the announcement of mandatory online courses, there has been little information provided to parents, students, or teachers about staffing. There is the potential for differentiated staffing as found in postsecondary settings where instructors work with teaching assistants (TAs) who provide learning assistance to students in f2f or online tutorials and assist in grading assignments under instructor/teacher supervision. This approach may be used in a K-12 setting, especially in courses with larger class sizes. The issue of staffing is an important one, where many students may likely take online courses in local school settings through online courses included in the timetable and in the school’s computer lab or learning commons (library) setting. How will the role of teachers in ensuring that students are on-task change when the responsibility for monitoring student motivation and progress moves from the teacher-led setting (the classroom) to online settings where students are responsible for monitoring their own progress? One consequence of the policy announcement will be teacher contractual issues and school district budget issues to ensure appropriate staffing and student success.

Which online courses? Course design and class size are important policy considerations emanating from the Ontario announcement. So too are decisions about which courses will be available online. Decisions about online courses are complex. For example, which courses can be offered online where learning outcomes require hands-on/experiential lab- and/or field-based learning activities. Chemistry class without a chemistry lab; biology without hands-on laboratory experiences; vocational classes without shop settings to acquire the physical skills associated with knowledge acquisition, make some courses more difficult to offer in fully-online mode. It seems evident that science classes require some form of physical presence, and that the teaching of mathematics also has challenges whereby scripting/writing for problem-solving requires notation. These requirements make written exchanges more difficult in online settings. While mathematical emulators are available, the fluidity of handwriting and mathematical notation makes “keyboarding” excessively laborious. While solutions utilizing tablets are available, the lack of information regarding provincial funding for the mandatory online courses policy initiative makes decisions about the purchase and provision of tablets impossible without clarity regarding enabling funding. Again, lack of detail and criteria for the choice of courses and their offerings means that students, families, and school districts are left to contemplate decisions with incomplete information.

Technological Infrastructure: Online courses, by their very nature, are offered on the Internet, requiring adequate technological infrastructures. With the announcement that all secondary school students would be required to successfully complete four online courses, there was no concurrent announcement or subsequent communication from the Ministry of Education regarding the technological support systems for this policy. As Canada’s largest province, Ontario’s borders span the Great Lakes in the south, and reach the Arctic in the north, and within this great expanse there are many communities lacking access to stable, reliable high-speed internet. Some school districts in Ontario do not have robust computer networks in all schools. Some schools provide computer technologies through school computer labs while others employ on-cart mobile tablets, or Chromebooks. Still others have addressed technology use by designing wireless networks throughout their schools, and in many cases school districts have developed Bring Your Own Device (BYOD) policies to address in-school uses of technology. The use of smartphones continues to be pervasive among teens [31]. Yet, when announcing the requirement for online courses, the Ministry of Education also announced a policy restricting smartphone use in schools, creating a curious policy paradox regarding smartphone technologies and their increasing power and popularity among the target audience. The diversity of internet access, and the variety of end-user devices, make decisions about course design technologies even more complex. Questions about operating systems, mobile vs desktop, and current vs legacy technologies will affect choices in course design and student and faculty support systems. While computer systems have generally grown more reliable, not all school districts provide just-in-time technological support or

support for non-school owned assets. Technology support is a critical component of any Information Communication Technology (ICT) system planning.

At the provincial level, even more questions arise regarding the systems used to support the enrolment of students in courses. If 628,000 secondary students [9] take up to two courses a year, this may result in over a million registrations and thousands of course sections available to students. From an ICT system planning perspective, the backend challenges are many, including integration with local student information systems, reliability, data backup, access controls, and security issues where systems are under constant attack. Privacy issues arise with student use of sanctioned and non-sanctioned tools which may collect individual student information [32]. Moreover, questions arise regarding how to ensure and protect equal opportunities, and provisioning to ensure equal student access, including access to devices and the Internet at home. For rural students and students living in remote locations, geography, and available local school and community technologies (libraries and community centers) suggest that the policy of mandatory online education may exacerbate inequalities in educational achievement.

Companion policy - Academic Misconduct and Remediation: One area of online learning policy that could benefit from critical policy analysis is academic integrity. While issues associated with plagiarism have often been left to local schools and teachers in the classroom, the establishment of large online courses and/or many sections of a particular online course employing similar or identical design, will undoubtedly lead to instances of either poor decision-making amongst students in a “cut and paste” environment or intentional academic misconduct. It seems that policy designers often consider the overall importance of a mandatory educational policy, but less so, the implications of such a policy. Thus, in critically examining the Ontario online learning policy announcement, it strikes us that the necessity to establish “allied” or companion policies and supports has been missed. How will students be taught to understand academic integrity, and what tools will be used to ensure it? How will student intellectual property be addressed if tools such as Turnitin are used, which store individual student submissions for comparative purposes? How will violations from acceptable standards be dealt with and by whom? Will the Ministry of Education or local school boards develop online tutorials for academic integrity, and will they be mandatory? While online academic integrity is often thought of as being more prevalent, issues regarding the integrity of tests and examinations abound. Will final exams be held online and where? Will students who have grown familiar with completing assignments mediated by some form of technology be limited to paper and pencil? Will local schools act as test centers? The policy implications of not carefully thinking through these questions make intractable problems more likely to occur.

Professional Development: Lastly, no examination of the move toward making online learning mandatory in Ontario would be complete without some discussion of how to ensure that the education system possesses the capacity to effectively deliver online courses, and for students to successfully complete such courses. Teaching is more than

the delivery of course material or answering questions about specific course content. Teaching is a complex set of activities and practices which involve relationship-building, decision-making, diagnosis of individual student needs, group dynamics, recognition and laddering of knowledge, and critically, at the secondary school level, motivating and monitoring student progress [33]. It cannot be assumed that teachers are equally competent in adapting practices that are successful in a physical classroom environment to an online environment. To date, there have been no announcements by the Ministry of Education as to how professional development in online learning will be offered, and what it may involve.

Since teaching involves more than merely “delivering” subject-matter content, or just “instructing” students, then teachers will have to learn how to create and/or adapt courses for success in online contexts, especially in terms of increased individualization and personalization of learning in these contexts. The current policy environment is mute with respect to individualization, local adaptation, or opportunities to learn how to design, re-design, and/or adapt curriculum for successful online learning. Regardless, teachers will need professional education to understand the online environment and how to teach in online courses and programs.

5. CONCLUSION: UNKNOWN UNKNOWNNS

According to Wikipedia, “unknown unknowns” are risks that arise in situations that are so unexpected that they would not be considered. Originally coined in response to a question posed to Donald Rumsfeld, former U.S. Secretary of Defense to questions arising from evidence of chemical weapons in Iraq, the expression has become a means to address policy deficits where the outcomes arising from policies are unforeseen. This can be applied to Ontario’s new policy of mandating four online courses to graduate from secondary school. Questions abound regarding issues of credit recognition by postsecondary institutions in the rest of Canada and abroad, enrolment by overseas students for residency purposes, language competency, accelerated graduation, unforeseen equity issues, and provisions for students with exceptionalities, among others. Large system changes require careful planning, and this is amplified when the number of people within the system is large [34]. If policy is the outline of principles that are intended to address a particular problem, or to foster an intended outcome, then unexpected outcomes arising from policy must inform public policy. Unfortunately, while a policy intended to prepare students for a world in which work and value-creation is mediated through online activities is laudable, the current Ontario mandatory online learning policy is lacking. We strongly suggest that the Ministry of Education rethink its mandatory online learning policy for Ontario’s K-12 students in light of critical issues raised here.

6. REFERENCES

- [1] Ontario Ministry of Education, Education Facts, 2017-2018 (Preliminary). Retrieved @ <http://www.edu.gov.on.ca/eng/educationFacts.html>

- [2] Ontario Ministry of Education. 3.15.2019. Education that works for you – modernizing classrooms. Retrieved @ <https://news.ontario.ca/edu/en/2019/03/education-that-works-for-you-2.html>
- [3] Authors:. (in press). Don't answer that!"- A critical policy analysis of the cell phone ban in Ontario Schools. ICSIT, Orlando. March 10-13, 2020.
- [4] OSSTF. 2019. Impact of class size increases: modelling the effects on school programs – full report. Retrieved @ file:///C:/Users/100357417/Downloads/impact-of-class-size-increases-full-report_updated-may-22-2019.pdf
- [5] People for Education. 7.9.2019. Ontario e-learning plan unique in North America. Retrieved @ <https://peopleforeducation.ca/our-work/ontario-e-learning-plan-unique-in-north-america/>
- [6] Ontario Ministry of Education (2016). Ontario schools: Kindergarten to Grade 12. Policy and program requirements. Retrieved @ http://www.edu.gov.on.ca/eng/document/policy/os/onschools_2016e.pdf
- [7] Ontario Ministry of Education (2013). Provincial e-learning strategy master user agreement @ <http://www.edu.gov.on.ca/elearning/MasterUserAgreement.pdf>
- [8] Barbour, M. (2019).4.15.2019. State of the Nation: E-learning in Canada: Ontario: Modernizing classrooms. Retrieved @ <https://k12sotn.ca/blog/ontario-modernizing-classrooms/>
- [9] People for Education (2019). What Makes a School? Annual Report on Ontario's Publicly Funded Schools 2019. Toronto, ON: Author. Retrieved @ <https://peopleforeducation.ca/wp-content/uploads/2019/06/PFE-2019-Annual-Report.pdf>
- [10] Barbour, M. & LaBonte, R. (2018). State of the Nation: K-12 E-learning in Canada. Retrieved @ <https://k12sotn.ca/wp-content/uploads/2019/01/StateNation18.pdf>
- [11] Bates, T. (2018). Summary of the 2018 survey of online learning in Canadian colleges and universities. 12.20.2018. Retrieved @ <https://www.tonybates.ca/2018/12/20/summary-of-the-2018-survey-of-online-learning-in-canadian-colleges-and-universities/>
- [12]. National Center for Education Statistics. 2015. Table 3. Number of virtual schools. Retrieved @ https://nces.ed.gov/ccd/tables/201314_Virtual_Schools_table_3.asp
- [13] Glander, M. (2015). 12.16.2015. Virtual schools: Measuring access to elementary and secondary education in online environments. Retrieved @ <https://nces.ed.gov/blogs/nces/post/virtual-schools-measuring-access-to-elementary-and-secondary-education-in-online-environments>
- [14] National Forum on Education Statistics. (2015). Forum Guide to Elementary/Secondary Virtual Education Data. (NFES 2016-095). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved @ <https://files.eric.ed.gov/fulltext/ED565838.pdf>
- [15] Boulton, H. (2008). Managing e-Learning: What Are the Real Implications for Schools? *Electronic Journal of E-learning*, 6(1), 11-18. Retrieved @ <https://files.eric.ed.gov/fulltext/EJ1098713.pdf>
- [16] State of Michigan Department of Education (2013). State Board of Education statement online learning” Retrieved @ https://www.michigan.gov/documents/mde/SBE_Statement_on_Online_Learning_final_414547_7.pdf
- [17] The State School Aid Act of 1979: Act 94. Retrieved @ [http://www.legislature.mi.gov/\(S\(yjnavktyssstgrm3qljja3s\)\)/mileg.aspx?page=GetObject&objectname=mcl-388-1621f](http://www.legislature.mi.gov/(S(yjnavktyssstgrm3qljja3s))/mileg.aspx?page=GetObject&objectname=mcl-388-1621f)
- [18] Clark, T. (2001). Virtual Schools: Trends and Issues. A Study of Virtual Schools in the United States. Retrieved @ <https://files.eric.ed.gov/fulltext/ED462923.pdf>
- [19] Freidhoff, J. R. (2019). Michigan's k-12 virtual learning effectiveness report 2017-18. Lansing, MI: Michigan Virtual University. Retrieved @ <https://mvlri.org/research/publications/michigans-k-12-virtual-learning-effectiveness-report-2017-18>
- [20] Michigan Virtual (2018). School board guide to online learning. Version 2. Retrieved @ https://mvlri.org/wp-content/uploads/2018/01/MV_Schoolboard_Guide_Web.pdf
- [21] Freidhoff, J. (2019). CANeLearn.5.29.2019. Online learning graduation requirement: Lessons from Michigan. Retrieved @ <https://canelearn.net/online-learning-graduation-requirement-lessons-from-michigan-guest-blogger/>
- [22] National Education Association (2006). Guide to online high school courses. Retrieved @ <http://www.nea.org/assets/docs/onlinecourses.pdf>
- [23] Biocca, F., Harms, C., & Burgoon, J. K. (2003). Toward a more robust theory and measure of social presence: Review and suggested criteria. *Presence: Teleoperators & virtual environments*, 12(5), 456-480.
- [24] Anderson, T. (2004). Towards a theory of online learning. *Theory and practice of online learning*, 2, 109-119.
- [25] Van Oostveen, R., DiGiuseppe, M., Barber, W., Blayone, T. & Childs, E. (2016). "New conceptions for digital technology sandboxes: Developing a Fully Online Learning Communities (FOLC) model." In *EdMedia+ Innovate Learning*, pp. 665-673. Association for the Advancement of Computing in Education (AACE), 2016.
- [26] Molnar, A., Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., Rice, J.K. (2019). Virtual Schools in the U.S. 2019. Boulder, CO: National Education Policy Center. Retrieved @ <http://nepc.colorado.edu/sites/default/files/publications/Virtual%20Schools%202019.pdf>
- [27] Farhadi, B. (2019). Summary of findings. Online blog 4.6.2019. Retrieved @ <https://beyhanfarhadi.com/2019/04/08/summary-of-findings/>
- [28] Barbour, M. K., & Stewart, R. (2008). A Snapshot State of the Nation Study: K-12 Online Learning in Canada. *North American Council for Online Learning*. Retrieved @ <https://files.eric.ed.gov/fulltext/ED509635.pdf>
- [29] Alberta Distance Learning Center. Retrieved @ <https://www.adlc.ca/>
- [30] British Columbia. Online and distributed learning. Retrieved @ <https://www2.gov.bc.ca/gov/content/education-training/k-12/support/classroom-alternatives/online-distributed-learning>
- [31] Pew Research. 12.6. 2019. Mobile fact sheet. Retrieved @ <https://www.pewinternet.org/fact-sheet/mobile/>
- [32] Robertson, L., Muirhead, B. & Leatham, H. (2018). *Protecting students online: International perspectives and policies on the protection of students' digital privacy in the networked classroom setting*. 12th International Technology, Education and Development (INTED) conference. Valencia, Spain, March 5-7, 2018. Pp. 3669-3678, doi: 10.21125/inted.2018.0705
- [33] Palloff, R. M., & Pratt, K. (2013). *Lessons from the virtual classroom: the realities of online teaching*. San Francisco: Jossey Bass.
- [34] Waddell, S., Waddock, S., Cornell, S., Dentoni, D., McLachlan, M., & Meszoely, G. (2015). Large systems change: An emerging field of transformation and transitions. *Journal of Corporate Citizenship*, (58), 5-30.