International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2020, *Vol. 16, Issue 3 (Special Issue), pp. 16-34*

Point, Read, Think, Click: Expanding New Literacies in Kazakhstan and Mongolia

Kate Maloney Williams
University of Maryland, College Park, U.S.A.

ABSTRACT

One of the most common indicators of a country's development is its literacy rate. However, beyond traditional conceptions of reading, writing, and arithmetic, literacies in the 21st century require additional skills and competencies geared towards the saturated and constantly changing digital environments in which we live. These skills and competencies are not yet universally - or still, in many cases, regionally - defined. This comparative study uses secondary desk research to investigate the education systems of two countries - Kazakhstan and Mongolia - to better understand the historical and social contexts in which they have approached ICTs in Education and teacher development. From this view, it then outlines different strategies and theoretical frameworks that officials and educators may use to improve teacher instruction and student learning with technology. The resulting recommendations hold the potential to assist any country with redefining national benchmarks, student scorecards, and global literacy indicators; flattening transmission models and applying digital pedagogy; redesigning in-service for teachers; and doing more to launch blended learning environments.

Keywords: *comparative studies, ICT4D, digital literacy, education policy, teacher development*

INTRODUCTION

To thrive in the 21st century, educators must reconsider what it means to be literate. Faced with the proliferation of constantly emerging and evolving technologies, literacy is no longer built solely on the ways in which we process and articulate linear narrative. Rather, the Internet and other forms of information and communication technologies (ICTs) require new literacies to make sense of the current world and generate global development. Back in 1998, Tapscott (p. 63) wrote about the first digital generation and espoused "never before has it been more necessary that children learn to read, write and think critically. It's not just point and click. It's point, read, think, click." Theoretical studies on new literacies have emerged over the past twenty years to address this need (Coiro et al. 2008); however, applied conceptualizations of digital pedagogies remain nascent - with widespread inequalities across global classrooms. As a piece of etic research, both Kazakhstan and Mongolia pose interesting units for study. Although neighbors, both have markedly different demographics and cultures and cannot be considered mutually exclusive. However, the potential to build transformative digital classroom intervention without having to uproot existing groundwork remains real for either.

This qualitative study uses constructivism and two methodologies: secondary and comparative research to make meaning of the ecology of both education systems and analyze gaps for ICTs in Education. Secondary research is well considered to be a beneficial precursor to primary research. The intention is to not just better understand the meaning behind similarities and differences but to build knowledge towards better designed evaluation or intervention. The comparative method (Anderson 1961; Glaser 1965; Bereday 1967; Bray et al. 2007) provides for the deconstruction of features from each education system to logically infer relevant recommendations. This paper will proceed by describing both systems separately, before providing a brief literature review on new literacy concepts, followed by strategies targeted at transformative application.

KAZAKHSTAN: MODERN EDUCATION SYSTEMS AND THE STATE OF EDUCATION

At present, Kazakhstan is recognized as an upper-middle income economy with a widely privatized marketplace and high level of development. However, economic diversification remains poor with most activities focused on the extractive industries, which has caused significant environmental damage. (OECD 2014). Additionally, Kazakhstan demonstrates a large geographical divide amongst its people with more than 54% of the population living in urban areas ("Kazakhstan – Urban" n.d.). Additionally, in 2014 there were "twice as many people living below the poverty line of USD 2.3 per day in rural areas than there are in urban areas" (OECD 2014, p. 29).

The current education system is decentralized, consisting of both private and public authorities with 2,700,000 school students across all compulsory levels (Kurakbayev 2018).Constitutionally, preschool through upper secondary are designated as both compulsory and free of charge with most children starting preschool around age five. The Organisation for Economic Co-Operation and Development (OECD) (2014, p. 32) reported that:

> primary education starts at the age of 6 or 7 and takes 4 years. The duration of lower secondary education is 5 years, followed either by 2 years in general upper secondary education or 3 to 4 years in technical and vocational education . . . Students that successfully complete general upper secondary education can [also] attend short . . . vocational training programmes.

Overall, the literacy rate remains high at 99.8% ("Ministry of National Economy" n.d.). However, this does not account for new literacies -- with the Kazakh government only reporting digital literacy indicators in terms of computer usage and not actual skills ("Ministry of National Economy" n.d.).

Due to the early introduction of computers in the 1980s, digital presence is generally high (or at least achievable) in schools. Although the Trends in International Mathematics and Science Study (TIMSS) 2011 report found that "secondary students in Kazakhstan enjoy a better student-computer ratio than in many countries, and schools . . . had reasonable if not generous numbers of computers and interactive whiteboards . . . the potential for computers to support innovative teaching in schools is not yet being fully exploited" (OECD 2014, p. 95). This was due to digital resources rarely being used in subjects other than computer studies or informatics, and there was no uptake of them to improve student research skills or otherwise support those with learning disabilities. Secondary education is provided through a range of different institutions: traditional schools, ungraded schools, lyceums, gymnasiums, and specialized schools dedicated to specific subjects like mathematics or science. Normally, lower secondary schools consist of Years 5 through 9 with most students finishing around age 16. Higher secondary school covers Years 10 and 11, and students can pursue more work-focused tracks. However, the implementation of a twelve-year education model across the school system is scheduled for completion in 2020.

Additionally, the Kazakh education system emphasizes student assessment as a regular part of class and for upward matriculation at the end of Year 9. Teachers assess their students by:

> "using a 1 to 5 scale, and a set of general didactic criteria that were first developed during Soviet times . . . In practice, teachers' judgments are based on comparing each student's achievements with those of other students in the same class. This 'norm-referenced' approach to classroom assessment has many disadvantages" (OECD 2014, p. 117).

In another vein, Kazakhstan also offers Technical and Vocational Education (TVE) for preparing roughly 3/4 of the workforce. However, TVE has faced substantial structural problems since "24.4% of jobs do not require any identifiable knowledge and skills . . . with more than half being unskilled

workers in industry, construction, mining and other technology-related sectors of the economy. The other half of unskilled workers come from services, sales, etc." (Nazarbayev 2014, p. 9).

For those seeking higher academic training, all universities in Kazakhstan are centralized. There are two types of higher education: "a) universities that focus entirely on teaching and do not engage in research; and b) universities that focus more heavily on research but take on students as well" (Mukashovna 2013, p. 125). Technical and vocational education is provided in professional lyceums, which were redubbed as "colleges" in 2013 (OECD 2014). Furthermore, "admission is based on the results of the National Unified Test (UNT) at the end of grade 11, which is a combined upper secondary school leaving certification and university entrance examination" (OECD 2014, pp. 34-35). However, for the UNT, "students are only asked questions, whose answers appear in their school textbooks, and the simple multiple-choice format" (OECD 2014, p. 12). It has been questioned how effectively these tests capture true comprehension, application, and higher-order thinking.

An additional issue with the Kazak education systems is infrastructure -- with 201 mainstream school facilities facing noncompliance with health and safety standards (Kurakbayev 2018). Due to the surplus of youth in Kazakhstan, schools are at over capacity with the school day broken down into two shifts being taught by the same teachers. As "the state curriculum in Kazakhstan requires lessons to be taught for six days a week, Monday through Saturday . . . [it] proves particularly exhausting for teachers" (OECD 2014, p. 97). There are even "70 three-shift schools and one four-shift school in the country" (Kurakbayev 2018, n.p.). Kazakhstan also still faces issues with its geographical divide and commitment to provide education to all areas. With the decline of boarding schools, Kazakhstan upholds a policy that each community has the right to a school if it has at least five children of compulsory school age. Therefore, in rural regions, most schools are designated as "ungraded" – with these schools making up 57% of schools in the country (Kurakbayev 2018). This refers to "small schools . . . which do not have enough pupils to give each year group its own class and so teach students of different age groups together in one class" (OECD 2014, p. 32).

KAZAKHSTAN: PROMOTING 21ST CENTURY SKILLS AND DIMINISHING INERT KNOWLEDGE

According to Khegay (2017, p.5), "Kazakhstan is part of a global trend of countries that have recently stated a need to implement significant and fast-paced reforms in secondary education in order to develop human capital and thereby enhance economic competitiveness.

> "Historically, "the main source of information and knowledge was a teacher or a priest, while now the sources of information are teachers, numerous textbooks and books, media, Internet, students themselves, etc., that generate information and knowledge from a variety of sources" (Mynbayeva & Anarbek 2016, p. 259).

Former Soviet teaching traditions placed high value on "frontal teaching with relatively little interactivity or work with small groups, and with a focus on theory rather than practice and an emphasis on memorizing key texts and facts" (OECD 2014, p. 87-88). As such, the modern education system has yet to catch up and reframe these strategies for building more critical analyses and collaboration. As Mynbayeva & Anarbek (2016, p. 263) state, "technologies based on connectivism, have not become widespread yet, both in terms of development and application." This is problematic because the need for connectivism is fueled by globalization and the rise of the digital marketplace, as well as a particular cache of competencies called "21st Century Skills." Although there is not one generally accepted definition of these skills, they typically refer to demonstrations of creativity and innovative thinking, critical thinking and problem solving, decision-making, communication and multilingualism, collaboration and generativity, information and media

literacies, life-long learning, metacognition, ICTs , global citizenship, adaptability, and cultural competence (Kulakhmetova et al. 2014).

Kazakhstan, like many societies, has been aspiring towards becoming knowledge based. The State Programme for Education Development for 2011-2020 hopes to transform Kazakhstan into "an education country with smart economy and highly qualified labour force" (OECD 2014, p. 36). Furthermore, the Government's Digital Kazakhstan programme seeks to improve quality of life and to increase the competitiveness through the digital ecosystem development. Its main directions include the digital government, high technology digital infrastructure development, transformation in economy sectors and human capital development (Shayakhmetova 2017, n.p.). However, for many countries "the first standardization point of view is mostly prompted and supported by international comparative sites such as TIMSS and PISA[1]" (Kulakhmetova et al. 2014, p. 8). But, as OECD (2014, p. 88) reported:

> both PISA 2009 and TIMSS 2011 point to the same conclusion. The secondary school system of Kazakhstan . . . is relatively weak at enabling students to acquire and practice higher order thinking skills, such as applying and reasoning in maths, or reflecting on and evaluating texts (particularly texts in an unfamiliar format) when reading.

These poor PISA results were more than just a disappointment to educators and administrators - they created a public outcry throughout Kazakh society. Consequently, several large initiatives were undertaken including the 2010 launch of Nazarbayev University, an English language taught international research university, particularly focused on training teachers in new pedagogies, and the Nazarbayev Intellectual Schools (NIS) network, "an experimental platform for the development . . . of modern models of education" (Kurakbayev 2018, n.p.). NIS works to pilot new methodologies that are currently out of reach of mainstream schools with eventual system-wide roll-out as an objective (Nazarbayev 2014). There are currently 22 NIS across the country, and they hold "autonomy in designing [their] own academic program, entrance exams, assessment systems, [and] testing new academic programs" (Kurakbayev 2018, n.p.). They are also attempting to tackle issues like "the overload of academic subjects; suppression after 7th grade of other subjects important for the development of imagination, creativity and collaborative skills; [and] the over-emphasis on theory rather than practical application" (OECD 2014, p. 107-108).

Nevertheless, NIS circumvents resolving some of the systemic issues faced in mainstream classrooms, particularly with regards to teacher experiences. For example," nearly two of every three teachers in Kazakhstan feels that they are lacking the skills" to do their jobs (OECD 2014, p. 79). Furthermore,

> "teachers with experience over 10 years also have difficulties in . . . using information and communication technologies. An analysis of new educational technologies application demonstrated that the following technology is the most known and used: academic discussion" (Nabi et al. 2016, p. 3432).

Moreover, critical thinking development was only used by teachers under the age of 30, and design methods and ICT were not sufficiently used by teachers over the age of 55 (Nabi et al. 2016).

Overall, Kazakh officials recognize digital literacy needs to be more broadly defined to include qualitative terms for educators (Primeminister.kz 2018). It was noted in 2014 that to achieve this end, "national standards, subject programmes, pedagogy and textbooks need to be revised with a

[1] Programme for International Student Assessment

view to setting expectations for the development of more challenging intellectual function – comparing, analysing, applying, critiquing, inquiring, explaining, arguing" (Nazarbayev 2014, p. 3). The new State Compulsory Standard [SCS] emphasized "a new paradigm of teaching and learning, where teachers are expected to develop student's [sic] abilities and capacities that are essential for both the achievements of higher standards of education, including those measured by PISA, and master 21st century skills." (Kulakhmetova et al. 2014, p. 7). A criteria-based assessment model was developed that "compares students' achievements with clearly defined, collectively developed criteria, which are known to all participants of the process (teachers, students, their parents, education school administrators) in advance" (OECD 2014, p. 118). These criteria were then selected to correspond with the students' goals and lesson content and are used in both formative and summative assessments. However, "few teachers in Kazakhstan outside the NIS schools have been trained to use criteria-based assessment effectively" (OECD 2014, p. 122). There also continue to be issues with Internet connectivity.

Additionally, when representatives from OECD went to observe Kazakh e-learning in action, "the students seemed to be doing a traditional memory-based test of mathematical knowledge, except that the questions appeared on a computer screen rather than on a blackboard" (OECD 2014, p. 95). Despite Kazakh society's desire to build functional new literacies and stimulate creative thinking, problem solving, and lifelong learning, no action is being undertaken in mainstream schools while NIS develops. For many, NIS are perceived as elite, and students and teachers are both suffering from very low resources in mainstream schools.

MONGOLIA: MODERN EDUCATION SYSTEMS AND THE STATE OF EDUCATION

Kazakhstan's somewhat distant neighbor, Mongolia, has uniquely been described as the "crossroads of European, Islamic, and Oriental civilizations" (Mendee 2012, p. 1). More than half of Mongolia's population currently lives in the capital city, Ulaanbaatar. This is a marked shift from the mid-twentieth century when "78 percent of the population lived in rural areas" (Leibo 2013, p. 40). Despite this urban concentration, Mongolia is widely known for its large rural community of nomadic herders, and the animal-husbandry sector continues to be the main source of food and raw materials, employing 35% of the population ("Mongolia at a glance" n.d.).

Administratively, the country is divided into 21 *aimags* (or "provinces"). In terms of national governance, the Mongolian people have experienced much flux over the past hundred years; shifting from totalitarian to authoritarian to democratic regimes. While technically never part of the USSR, Mongolia maintained very close political and economic ties (Weidman & Yoder 2010), primarily driven by its own lack of industrialization (Mendee 2012). However, "the collapse of the Soviet Union in 1991 meant that the support Mongolia had been receiving . . . evaporated almost overnight." (Engel et al. 2014, p. 10). With foreign aid assistance, steps were taken to liberalize and privatize the economy with growth being on the upwards trajectory since the mid-2000s. Market recovery has been partially "fueled by a boom in mining exploration (most notably copper, uranium, iron, and gold) with copper and gold now thought to contribute more than two-thirds of the country's GDP" (Engel et al. 2014, p. 10-11). This, in turn, has strained the environment, which the Government hopes to mitigate with the implementation of a national technology programme to turn Mongolia into a knowledge-based economy. National development priorities have included ensuring high technology-based and environmental production practices, promoting human development, and minimizing bureaucracy and corruption (UNESCO 2013). Many media observers have expressed concern over "the limited implementation of professional best practices in the media, as well as the full enactment of freedom of information laws" (UNESCO 2013, p. 8). According to UNESCO (2013, p. 8), Mongolian authorities partnered with them to "improve media self-regulation, assist with media law reform, encourage ICT development, promote the role of media on gender issues, support the freedom of information and raise awareness on the role of

media in elections." Yet, there remains little focus on open access, minority representation, community media, historical preservation, or quality investigative journalism.

By contemporary standards, "the average student in Mongolia is expected to complete at least some post-secondary education or training – a track record to rival that of many OECD countries" (Engel et al. 2014, p. 12). It is claimed that Soviet era mass literacy campaigns caused Mongolians to place a high value on education, even within the nomadic community (Engel et al. 2014, p. 18). Mongolia is one of the highest internationally ranked countries in terms of GDP allocation, with the law guaranteeing that "at least 20% of the government is spent on education" (Tuul et al. 2016, n.p.). Overall, Mongolia still maintains one of the highest literacy rates in the world at 97.5% ("Mongolia at a glance" n.d.). However, it is still struggling with curriculum quality, teacher qualifications, consistent education standards, and the relevancy of supply-based vocational education. The underlying philosophy and rationale of the national curriculum is to help create citizens "that are able to live in a humane, civil and democratic society" and emphasizes problem-solving, deductive reasoning, and communication skills ("Ministry of Education, Culture" n.d.). The 1992 Mongolian Constitution guarantees universal access to education that is inclusive and free of charge. In 2008, the school system was expanded to encompass 12-years, which included:

> preschool and kindergarten;
> four years of primary education, beginning at age eight;
> four years of lower secondary education, with compulsory education ending after Grade 8;
> two years of upper secondary education;
> postsecondary and higher education; and
> technical and vocational education and training. (Weidman 2002, pp. 99-101)

However, preschool is no longer compulsory, and only 15% of the preschool population comes from the herder community - for those not in school, poverty, teacher discrimination, and lack of dormitory accommodation were cited as the main causes (Engel et al. 2014). Interestingly, female enrollment tends to surpass male enrollment at each succeeding level of education. As such, "Mongolia is one of the few countries in the world where the educational attainment of males is significantly lower than that of females [and] the next generation is less educated than that of the parents' generation" (Steiner-Khamsi & Stolpe, 2006, p. 2). For the most part, "schools for the primary, lower-secondary, and upper-secondary levels, generally do not exist separately and are combined in one school campus. In 2010 there were only 79 schools offering just primary education in Mongolia (mostly in remote rural areas)" (Yembuu 2010, p. 683). The upper secondary-level curriculum focuses on the natural sciences, social studies, humanism, literacy, foreign language, professional skills, and physical development. However, professional skills/vocational training

> "has been one of the most neglected areas of education in Mongolia. After the initial transition shock in the first half of the 1990s, the number of students in technical and vocational education and training (TVET) sharply declined from 31000 in 1989 to 8000 in 1995" (Yembuu 2010, p. 683).

There are also growing divides when it comes to addressing students with special needs. The official policy is that special education should be integrated into the regular school system. However, more and more parents have needed to turn to homeschool or private tutoring (Yembuu 2010). The early 2000s introduced formal outcomes-based benchmarks and scorecards, including performance-based bonuses for public school teachers and several master plans and policies for national education development. However, these score cards are markedly different from those in OECD countries with student learning only making up a small amount of the score: "other criteria include lesson plans and teaching material of teachers, professional development of teachers,

organization of the classroom, condition of the school equipment, moral behavior and communication skills of teachers, and administrative work of teachers" (UNESCO 2017, p. 7).

MONGOLIA: PROMOTING 21ST CENTURY SKILLS AND DIMINSHING INERT KNOWLEDGE

After Mongolia's transition to a market-oriented economy, ICT development was also one of the country's top priorities with the first commercial Internet service provider emerging in 1996. Van Doodewaard (2004, p. 12) wrote that "driven by the private sector, ICT quickly spread to rural towns; small ICT enterprises mushroomed. Many technologically savvy youngsters began their careers as programmers in restructuring state institutions and then opened their own small businesses." This has led to a robust private sector with numerous software developers and retailers and adequate infrastructure to develop e-learning. However, many soums (or "districts") continue to have electricity problems and a lack of computer hardware due to budget deficits (Uyanga 2014). Furthermore, "most schools are understaffed or lack trained staff able to handle and configure their computers" (Uyanga 2014, p. 127). There has been some investment towards the development of standards and better training for teachers, but many secondary schools still lack dedicated informatics staff: "mainly mathematics and physics teachers teach informatics at schools where there is no professional informatics teacher. In some remote area schools, informatics is taught by un-licensed personnel who are considered to be good with computers" (Uyanga 2014, p. 134).

Furthermore, despite the early introduction of the Informatics curriculum to secondary schools in 1988, "the [Mongolian] government tends to focus on the T in ICT . . . There is a belief that once the infrastructure is there, the rest will follow" (Van Doodewaard 2004, p. 12). This techno-determinism has impeded the development of important new literacies with regard to digital media consumption, generativity, and exchange - only focusing on narrow hard skills, such as algorithmic development, modeling, and processing. Teachers from around the country believe students need "more education, more information about how to better use technology, and better parental control" (World Vision 2014, p. 32). This is somewhat in contrast to parental expectations - it was reported that 23.5% of parents believe students use the Internet at school in 2014 with "only 6.3% of teens who actually report using the Internet at school" (World Vision 2014, p. 4). Furthermore, a 2014 World Vision report on youth behaviour also revealed that Mongolian teenagers "reported spending significantly more time on Facebook than any other website" (World Vision 2014, p. 4). However, the country struggles with information literacy and quality journalism - positioning Mongolian citizens as vulnerable to disinformation or "fake news" in an era of corrupt social networks and post-truth politics.

Teachers in Mongolia are prepared professionally at colleges and universities - anyone who graduates with a teacher's diploma has the right to teach, but there is no national teacher accreditation system. The teaching profession is very highly regarded across the culture "with teachers often receiving higher salaries than doctors. In rural areas teaching is often the only secure and well-paid position" (Engel et al. 2014, p. 20). Additionally, a 2006 study noted that in rural areas, teachers are held personally accountable by parents and school administrators for student performance, including if students "do not do their homework, take proper notes, engage in useful after-school activities, clean the classroom, or maintain hygiene" (Steiner-Khamsi & Stolpe 2006, p. 137). Mongolian teaching models has also put a high emphasis on knowledge, which, in turn, "permeates all aspects of the profession" (Steiner-Khamsi & Stolpe 2006, p. 112). Yet, this has caused a devaluing of other skills, prompting reform of teacher training content and methodology from 2002 onwards.

Furthermore, a more substantive problem is the gap that "exists between the status of the teacher and the status of the student" (Steiner-Khamsi & Stolpe 2006, p. 113). One of the distinctive features of Mongolian education is the ubiquitous class monitor (*angiin darga*) system, which claims

to address this divide but not always effectively. Student leaders are selected from the top students to serve as liaisons between the students in class and the teacher with virtually no interpersonal communications between the teacher and the other students.

This system has been attributed to problems with the uptake of 21st Century Skills and pedagogies. For example, due to Mongolia's drive to adhere to international standards and practices, there has been a push to incorporate more group work. However, this is generally implemented in classrooms without other changes to the hierarchy, so class monitors serve as the go-between for the groups and teachers – transmitting questions and answers back and forth and presenting the work on behalf of the group. The 2006 study noted that there is little opportunity for individuals to speak and virtually no student-led activities (Steiner-Khamsi & Stolpe 2006). Current public opinion on the class monitor system is greatly divided amongst Mongolians, though parents vie to get their children chosen. Some worry the system is cruel for those never elected - believing it causes low self-esteem for unchosen students, while inflating the egos of the monitors, who may not necessarily achieve similar leadership status in the workplace. They also think that it hinders problem-solving and resiliency, conditioning other students to constantly rely on a leader. However, as noted in the 2006 study, some felt it better positions monitors to achieve that status later in life and prepares all students for the vertical hierarchies also prevalent in the workplace (Steiner-Khamsi & Stolpe 2006).

Nevertheless, Mongolian society has demonstrated a keen interest in adapting to the 21st century and participating in globalization. In 2017, the Mongolian Ministry of Education, Culture and Science published a new list of competencies and values intended to better ensure sustainable development. The list included the systematic analyses of problems, creative thinking, cooperation, environmental responsiveness, and gender equality (UNESCO 2017). However, according to the Opertti et al. (2018, p. 26), "the situational analysis of Mongolia revealed that GCED content in policy documents, curricula, and teacher training programmes is absent or very lightly touched upon." Additionally, despite rhetoric on better accountability, the Ministry has yet to clearly define what that should entail.

DIGITAL LITERACY: A ROUTE TO ALTERNATIVE THEORETICAL FRAMEWORKS

One shared trait between the Kazak and Mongolian education systems is that they are both working - and arguably struggling - to conceptualize how to impart 21st century Skills to their young learners. Both countries are emerging from contexts traditionally based in "banking systems of education" (Friere 1972). Further, they both desire globalization and digitalization, particularly to redefine their economies, but have difficulties in fully conceptualizing the competencies required for the international marketplace. Mainstream curriculum in both countries is too focused on hard informatic skills - with only some awareness of the normative values of Web 2.0 culture. Additionally, they have fallen into the trap laid out by many practitioners in the subfield of ICT for Development (ICT4D) – that technology per se is development. As Melkote & Steeves (2001, p. 263) argued "we have to separate the technology from the information it produces and examine people's capacities to receive, process, use, and transmit information." If one were to apply the *Latin American Cube Framework for Development*, for example, it could be said that they are hitting the first dimension of infrastructure but have only half-realized capabilities and skills (Hilbert 2012). The framework is shown in Figure 1 below. In other words, "merely introducing technology to the educational process is not enough" (Mishra & Koehler 2006, p. 1018). To fully achieve the skill set needed for navigating e-society, they also need to address social deliberative skills (Murray 2013). To this end, UNESCO has developed *A Global Framework to Measure Digital Literacy*, which outlines competence areas including fundamentals of hardware and software, information and data literacy, communication and collaboration, digital content creation, online safety, problem solving,

and career skills (Antoninis 2018). However, teachers additionally need to have their own pedagogical frameworks to better translate this framework into the classroom.

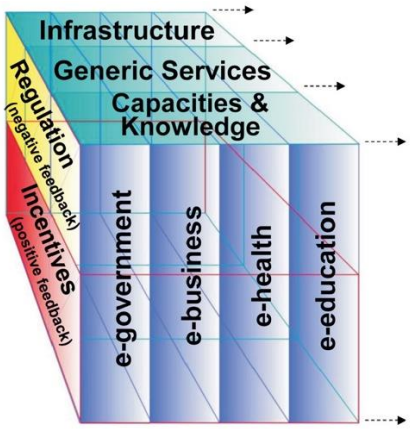

Figure 1: Latin American Cube Framework for Development (Hilbert 2012)

By first turning towards the field of comparative education, educators and policymakers may be able to identify how best to make improvements by "the addition of models, practices, innovations, and the like borrowed or transferred from other national educational systems" (Wilson 1994, p. 452). This includes being able to look towards international education and development communications practices regardless of a country's economic designation. Although indicators and policies are still emerging, other societies are starting to explore a more critical pedagogy surrounding ICT education. With this in mind, "ICT can be a catalyst by providing tools which teachers use to improve teaching and by giving access to electronic media that make concepts clearer and more accessible. It can also remove inequalities particularly between urban and rural communities" (Selinger 2009, p. 214). Digital literacy models have tried to guide the way towards understanding what it means to be fully literate in today's world, especially since "the screen has replaced the book as the central medium of communication" (Hutchison & Woodward 2014, p. 456). It is helpful to pair these so-called ICT skills with discussions of new literacies.

Fundamentally and divergently, reading specialists have identified online research and comprehension as the

> self-directed process of constructing texts and knowledge while engaged in several online reading practices: identifying important problems, locating information, critically evaluating information, synthesizing information, and communicating information. Online research and comprehension can take place individually, but often appears to be enhanced when it takes place collaboratively. (Leu et al. 2013b, pp. 1163-1164)

Unlike traditional print media, online texts require more than word processing and standard literacy (for example, word recognition, vocabulary, comprehension, inferential reading, the writing process, spelling, and response to literature) (Leu et al. 2013b, p. 1159). Rather, digital narratives force readers to "choose-their-own-endings," navigating a diverse range of multimedia and hyperlinks to collect information and construct knowledge. As further described by Leu et al. (2013b), each online reader must follow "a unique information path, selecting a unique sequence of links to information and sampling unique segments of information from each location ... Thus, in addition to constructing knowledge in their minds, readers also physically construct the texts they read online" (p. 1164). This puts more cognitive burden on the user and can impair comprehension as users not only absorb subject matter knowledge but simultaneously try to account for relevance

and reliability. This is even further aggravated by the fact that, "Internet texts integrate a range of symbols and multiple-media formats, including icons, animated symbols, audio, video, interactive tables, and virtual reality environments" (Leu et al. 2013b, p. 1160) that can overwhelm readers. As Coiro (2009, p. 459) argued, "readers [therefore] need a new type of inferential reasoning to anticipate these differences and decide whether or not each hyperlink will enhance or disrupt their search for meaning."

To this end, one of the most comprehensive frameworks for the integration of technology in the classroom is the TPACK Framework developed by Mishra & Koehler (2006). The model is shown in Figure 2 below. TPACK is intended to guide teachers through their own strengths and weaknesses in three domains: technological knowledge, pedagogical knowledge, and content knowledge. Ultimately, reflection in these areas come together to drive more innovative teaching and learning. Part of this framework is not new to education development - the content, which includes facts, concepts, and theories to be conveyed to the students, and the pedagogy - the instructional strategies, teaching models, and assessment to be used - are generally taught to Western teaching students for designing successfully scaffolded environments. However, the technology aspect here is what really fosters 21st century teaching by prompting educators to specifically think about the digital tools for learning and what those different platforms afford. Teachers need to select and integrate these tools just like they would plan out other parts of a lesson – configuring the right fit of websites, online games, and other apps for learning.

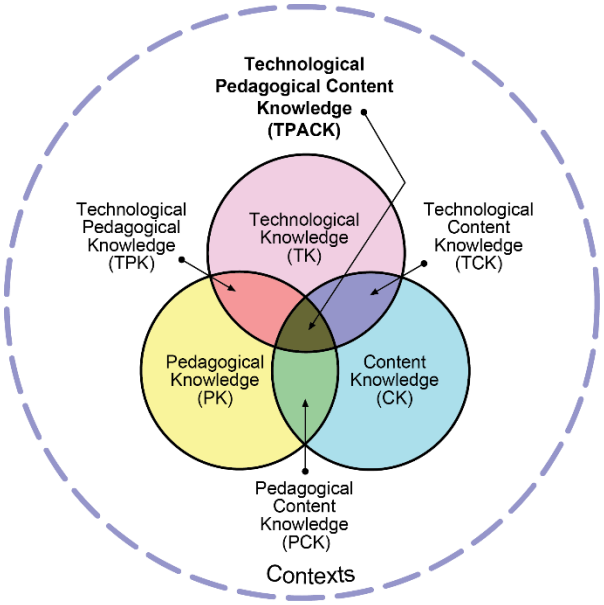

Figure 2: TPACK Model (Koehler 2012)

Additionally, to complement the TPACK Framework, the SAMR Model shown in Figure 2 below, prompts teachers to actively think about the way technology can either *enhance* lessons through augmentation and substitution or *transform* lessons through redefinition and modification (Common Sense Media n.d.). This can be an extremely useful means for delivering innovative lessons and better integrating computer usage across the curriculum rather than just keeping usage restricted to computer class and informatics teachers. In turn, this also models to students how to practically apply technology to their daily lives.

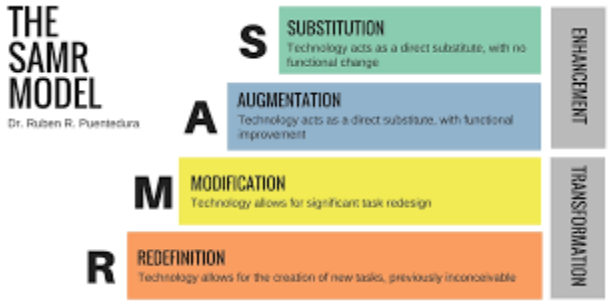

Figure 3: SAMR Model (Wikiversity 2018)

However, for those still fundamentally unversed in pedagogies and digital resources, there are additional options. As an instructional strategy, *Internet Reciprocal Teaching* is a method that can greatly support online readers, posing problem-based tasks to students and having them build their own response through various online-based tasks. *Internet Reciprocal Teaching* is an offshoot of Reciprocal Teaching. As a general overview, the implementation of *Internet Reciprocal Teaching* within a lesson usually takes two phases. In Phase 1, the teacher focuses on the hard skills like word processing and web searching, going about modeling those behaviors to the students. For Phase 2, tools such as discussion charts facilitate Think-Aloud exercises, encouraging students to wonder about different ideas and solutions while also considering their classmates ideas and making them cognizant of their own highly automatic processing. This helps to build critical evaluation and synthesis skills (Henry et al. 2012, Lenski 2008, Kiili et al. 2009, McVerry et al. 2009). Ultimately, the end goal is to enable students to constructively engage with strategy and meaning making, multimodal literacies, and appraising information reliability in their lives.

Beyond teaching strategies, "new technologies such as the Internet and other ICTs require additional social practices, skills . . . and dispositions to take full advantage of the affordances each contains" (Leu et al. 2013b, p. 1159). To start, "Internet readers need both prior knowledge of the topic related to the search task and experience of the use of the Internet to be able to locate relevant information" (Kiili et al. 2009, pp. 655-656). Many Internet readers do not evaluate for credibility and greatly vary in their own abilities to design and upload content in the way that it is intended and afforded by current platforms. As Gauntlett (2011, p. 5) explained:

> rather than just seeing the internet as a broadcast channel, which brings an audience to a website (the '1.0' model), Web 2.0 invites users in to play. Sites such as YouTube, EBay, Facebook, Flickr, Craigslist, and Wikipedia, only exist and have value because people use and contribute to them, and they are clearly *better* the more people are using and contributing to them.

The affordances provided by these open networks include the ability for anyone to publish material. Thus, understanding and being comfortable with digital authorship also becomes a prerequisite and necessary component of a revised curriculum. As Stern (2008, p. 99) wrote "young people are curious about what authorship entails, eager to take on the technological challenges presented by online authorship, and anxious to establish an online presence." Yet, rarely do youth stop and think about whether such expression is particularly valuable. The need for further scaffolding is high for "this sequence of events appears to be different for adults, who generally reflect on the expected utility of online expression *before* commencing to author a personal site" (Stern 2008, p. 101). Moreover, this ability is also what drives the need to educate students in the way of critical consumerism, since "information is much more widely available from people who have strong

political, economic, religious, or ideological stances that profoundly influence the nature of the information they present to others" (Leu et al. 2013b, p. 1161). Both critical consumerism and digital authorship help to create more equitable and equal opportunities.

In addition to helping foster these skills and values, digital literacy models change the classroom paradigm by truly hinging upon inquiry-based education. From Central Asia to North America, "current educational institutions often treat learners as consumers, fostering in students a mind-set of consumerism rather than of ownership of problems, which they carry with them for the rest of their lives" (Fischer 2011, p. 42). Unwin (2009, p. 21) delineates the implications: "at the heart of the most practical distinctions . . . 'knowledge' requires higher-order human processing, whereas 'information' is something that is generally only produced and communicated. Accordingly, if 'information' is not understood and actively used it cannot become 'knowledge'." Developments on this front have lagged in the United States despite the fact that several international assessments have already begun to include these skills. Although a few states have started to pass basic media literacy education laws, in 2013 it was noted that not a single state in the United States measured students' abilities to navigate search engine results, critically evaluate online information for reliability, or even compose effective e-mail messages (Leu et al. 2013a). Most educators rely on third sector guidance provided through seminars, learning labs, and conferences provided by different professional organizations and NGOs. These types of forums should be given more presence with comparative and local-level educators abroad.

Additionally, some Nordic countries provide excellent examples of how to better support the uptake of digital frameworks. Firstly, it is beneficial to have digital literacy definitions centralized and built into the national guidance. For example, the Norwegian Ministry of Education and Research (2004, p. 28) defined ICT beyond just coding and processing - as the ability "to use software, to search, locate, transform and control information from different digital sources . . . to evaluate, to make critical use of sources, to interpret and analyse digital genres and media forms. In total, digital literacy can be seen as a very complex competence." Additionally, Finland focuses all its teaching around problem and inquiry-based learning, collaboration, and multiple learning styles (Kulakhmetova et al. 2014). Like Norway, it defines ICT competence through the three areas of *information management, creative work, and social interaction* (Niemi et al. 2018, p. 52). At the center of Finnish teaching philosophy is universal design - "that if teachers know how to work with [the] most challenging students, they will be able to teach all students more effectively" (Kulakhmetova et al. 2014, p. 14). From 2014-2016, like many countries, Finland worked to revise its national core curriculum to encompass more 21st century skills - however, because pedagogy is centered around inquiry-based learning, revisions were integrated throughout every part of the education lifecycle, providing better payoff. As Niemi et al. (2018) explains, "Finnish education policy has four main principles that guide all the activities throughout the education system. These principles are *equity, high-quality education to all learners, flexible educational structures, and life-long learning"* (Niemi et al. 2018, p. 47). In this way, the Finnish education system has shown conduciveness towards what digital literacy frameworks espouse. Furthermore, inquiry-based learning is also what the Finnish government uses in its teacher training. Rather than train teachers in information-based knowledge, Finnish pedagogical institutions train all teaching students as researchers (Lee & Tan 2018).

STRATEGIES FOR INTERVENTION: AN OPEN DISCUSSION

Therefore, under these parameters, there are several recommendations that can bolster innovative learning in both these countries. If Kazakhstan and Mongolia aspire towards knowledge-based economies with digitally fluent citizens, they would do well to incorporate measurable objectives and benchmarks into their national guidance. This includes expanding the definition of digital competences as Norway has done. Kazakhstan, in particular, demonstrates a clear awareness of

what 21st century skills are aspiring towards; however, schools are suffering in the interim as they leave autonomy to NIS to negotiate what that should look like in practice. Change can be better driven if steps are taken to facilitate it across the culture rather than just experimentally on the periphery.

Furthermore, if countries are to fully engage with 21st century learning reforms, particularly in terms of development and intervention, international organizations need to create a new literacy index using revised methodologies. As it stands, outdated indicators are misrepresenting what it means to be literate in today's world. In turn, this prompts well-reported countries to problematically maintain status quo, while other countries misallocate resources. Both Kazakhstan and Mongolia read as having near perfect universal literacy; yet, clearly there is much room for growth, and its citizens are falling into a digital divide. In this way, Kazakhstan should also stop reporting computer usage as a digital literacy to better work towards achieving better equality and higher-level skills.

Students would also benefit in a reduction of standardized assessment and pedantic scoring criteria seen in both Kazakhstan and Mongolia, respectively. It has been demonstrated that teachers in Kazakhstan put the onus on the students to perform with limited guidance or responsibility shouldered by the educators. In some ways, this runs similar to Mongolia. Although in the Mongolian context, great accountability and ownership is put on the teachers for student performance, arguably too much emphasis is dedicated to minutiae (for example, the tidiness and formatting of notebooks). Similarly, it would be beneficial to balance out declining vocational training programmes with soft skills content, so that tradesmen equally have the skills to navigate an e-workforce.

Regarding pedagogical methods, there are a variety of interventions that can be done to help bolster this area. Broadly speaking, both societies need to retrain teachers and build various competencies. This involves framing several aspects of the classroom in a new way, including curriculum content and student-teacher communication. There are multiple approaches that can be taken to better transform classrooms into more transdisciplinary environments. Inquiry-based education should be a part of all subject matter across the education lifecycle, using digital technologies "to ask, investigate, create, discuss, and reflect" (Casey et al. 2009, n.p.). Teachers in Kazakhstan and Mongolia would be in a better position to implement inquiry-based education in their classrooms if their own teacher education systems were more research-based like Finland, rather than knowledge-based. This may hold the most potential for Mongolia, where the role of teacher as knowledge transmitter is so largely ingrained. In this new environment, the teacher takes on the role of "guide on the side" (McWilliam 2009) – utilizing methods such as scaffolding, modeling, and "talk-through" activities. This includes reducing the amount of work or individual problems assigned to students, doing collaborative group work, and allowing the use of digital tools as aids. Such strategies are transformative to industrial-style education environments, helping encourage the higher order thinking skills desired by these governments.

Within an inquiry-based environment, pedagogical training also needs to encompass an "understanding of the complex relationships between technology, content, and pedagogy, and using this understanding to develop appropriate, context-specific strategies and representations" (Mishra & Koehler 2006, p. 1029). For example, educators may find it useful to apply digital literacy frameworks as a lens for their lesson planning, such as TPACK and SAMR, and the widespread uptake of *Internet Reciprocal Teaching* in the classroom. Taking this type of holistic approach would better support the 24.4% of jobs previously mentioned that do not require identifiable skills. There may already be some support for this model embedded within existent Mongolian groupwork structure. However, there would be a marked need to diminish the liaison role of the student monitor, allowing more direct communications with the teacher. As it stands, the class monitor system significantly impairs the ability to reach individual students and offer support. Rather, teacher feedback should be more holistic and centered on the overall learning process - focusing

on progress monitoring and performance-based feedback - via direct lines of communication. If it is determined to keep the class monitor role, teachers could still set up specific forums or class times for students to interact with them directly. Some American educators have also taken up digital tools during class, such as encouraging digital backend channels so students can post questions directly to the teacher and receive responses without disrupting an oral lecture or otherwise ongoing group activity. Educators here could do the same if an equal ratio of students to computers is maintained.

Although Opertti et al. (2018) recommend both short- and long-term professional development for teachers, more needs to be done to redesign what in-service looks like in the 21st century. For starters, the criteria-based assessment tool developed under Kazakhstan's State Compulsory Standard appears to be exceptionally relevant in helping in-country educators foster 21st century skills - a push to expand training country-wide should be prioritized. However, as useful as training can be for specific tools or pedagogies, Mongolia and Kazakhstan demonstrate a need for further appraisal in this area, especially since both systems have invested so many resources into initial training but show signs of not meeting the needs of teachers throughout their careers. The suggested interventions here are particularly intended for helping older teachers who struggle to adapt to new practices and technologies alike. As Knobel & Lankshear (2014, p. 100) have argued "it is increasingly imperative for teachers *themselves* to experience and understand what it means to be fully engaged in new literacies practices." However, the rapid turnover of technology quickly renders teachers outdated with the latest software, hardware, and terminology every few years (Mishra & Koehler 2006). Putting more of a focus on interactive labs and collaborative seminars, where educators can practice hands-on learning and pool their own best practices, would be relevant here. This aligns with the grassroots digital literacy education movement in the United States, which has offered some support to teachers. Another strategy would be to offer more comparative exchange amongst international educators, so that a diverse range of emerging practices and models can be shared. Further, if local and international NGOs wanted to similarly improve digital competencies in informal spaces for students, a recommended strategy would be to direct efforts towards youth development, focusing on such areas as open access, identity representation, community media, historical preservation, and quality investigative journalism.

For Kazakhstan, additional recommendations include investing in more wireless infrastructure to launch better distance learning and blended learning environments. The ability to turn towards flipped classrooms as a supplement to the school day would potentially lessen the grueling working hours for teachers under the second-shift school system. Essentially, students could attend an abridged shift in the morning or evening and then work through additional lessons remotely. In-person and remote days could also be alternated to ease the burden of a six-day school week for both teachers and students. Furthermore, the requirement to engage with technology allows students to continue to practice their comfortability with the qualitative side of online platforms and software. The supplementary online school could be modeled after a Massive Open Online Course (MOOC) and developed by NIS educators and the education scholars at Nazarbayev University – those who have the most understanding and skills with these new pedagogies and government policies. Having a national classroom environment may also provide better peer-to-peer community for isolated rural youth in ungraded schools. In the case of Mongolia, distance learning practices may similarly serve nomadic youth whose communities have been impacted by the decline of boarding schools. It would allow isolated students to virtually interact with other peers their own ages, fostering a range of psycho-social benefits. Blended learning may also be a means for better supplementing special needs education in the mainstream classrooms and practicing out both hard and soft skills.

CONCLUSION

In conclusion, Kazakhstan and Mongolia are two distinctive societies that share some common historical trends and goals. Both contain education systems not fully equipped to foster the soft side of 21st Century Skills, despite having national agendas for e-transformation. However, "schools function only partially autonomously within a matrix containing other social institutions" (Epstein 1983, p. 9) - there are many societal structures and norms that can impede its further development. Digital literacy competences and indicators are not yet universally – or still, in many cases, regionally - defined. Where frameworks exist, there remains much vagary for teachers in terms of classroom practices and the normative shifts they entail. By taking a comparative approach to education, Kazakhstan and Mongolia can benefit from a range of digital literacy frameworks, models, and professional development practices that have emerged. This will help better establish ICT enabled education and take such recommended steps as redefining national benchmarks, student scorecards, and global literacy indicators; flattening transmission models and applying digital pedagogy; redesigning in-service for teachers; and doing more to launch blended learning environments, particularly to improve access with nomadic and otherwise rural student populations.

REFERENCES

Anderson, C. A. 1961. "Methodology of Comparative Education." *International Review of Education*, vol. 12, no. 4, pp. 1-23.

Antoninis, M. 2018. "A Global Framework to Measure Digital Literacy," 19 March. Available at: http://uis.unesco.org/en/blog/global-framework-measure-digital-literacy (Accessed: 31 January 2019).

Bereday, G. Z. F. 1967. "Reflections on Comparative Methodology in Education, 1964-1966." *Comparative Education*, vol. 3, no. 3, pp. 169-187.

Bray, M., Adamson, B., & Mason, M. (eds.) 2007. *Comparative Education Research: Approaches and Methods*, Hong Kong: Comparative Education Research Centre.

Casey, L., Bruce, B. C., Martin, A., Reynolds, A., Shiel, G., Coffey, L., & Hallissy, M. 2009. *Digital literacy: New approaches to participation and inquiry learning to foster literacy skills among primary school children.* Dublin, Ireland: Centre for Research and Innovation in Learning and Teaching, National College of Ireland.

Coiro, J. 2009. "Promising Practices for Supporting Adolescents' Online Literacy Development." In: K. D. Wood & W. E. Blanton, eds, *Promoting literacy with adolescent learners: Research-based instruction.* New York: Guilford Press, pp. 442-271.

Coiro, J., Knobel, M., Lankshear, C., & Leu, D. J. (eds.) 2008. *Handbook of Research on New Literacies,* New York: Routledge.

Common Sense Media. n.d. "Introduction to the SAMR Model." Available at: https://www.commonsensemedia.org/videos/introduction-to-the-samr-model (Accessed: 31 January 2019).

Engel, J., Prizzon, A., & Amgaabazar, G. 2014. *From Decline to Recovery: Post-primary education in Mongolia.* London: Overseas Development Institute.

Epstein, E. H. 1983. “Currents Left and Right: Ideology in Comparative Education.” *Comparative Education Review*, vol. 27, no. 1, pp. 3-29.

Fischer, G. 2011. “Understanding, Fostering, and Supporting Cultures of Participation.” *Interactions*, vol. 18, no. 3, pp. 42-53.

Friere, P. 1972. Pedagogy of the oppressed. London: Penguin.

Gauntlett, D. 2011. *Making is Connecting: The social meaning of creativity, from DIY and knitting to YouTube and Web 2.0*. Cambridge: Polity Press.

Glaser, B. G. 1965. “The Constant Comparative Method of Qualitative Analysis.” *Social Problems*, vol. 12, no. 4, pp. 436-445.

Henry, L. A., Castek, J., O’Byrne, W. I., & Zawilinski, L. 2012. “Using Peer Collaboration to Support Online Reading, Writing, and Communication: An Empowerment Model for Struggling Readers.” *Reading & Writing Quarterly: Overcoming Learning Difficulties*, vol. 28, no. 3, pp. 279-306.

Hilbert, M. 2012. “Towards a Conceptual Framework for ICT for Development: Lessons Learned from the Latin American ‘Cube’ Framework.” *ITID*, vol. 8, no. 4, pp. 243-259, graph.

Hutchison, A., & Woodward, L. 2014. “A Planning Cycle for Integrating Digital Technology into Literacy Instruction.” *The Reading Teacher*, vol. 67, no. 6, pp. 455-464.

International Reading Association. 2009. *New Literacies and 21st-Century Technologies*. International Reading Association.

Kazakhstan – Urban population. n.d. Available at: https://tradingeconomics.com/kazakhstan/urbanpopulation-percent-of-total-wb-data.html (Accessed: 31 January 2019).

Khegay, Y. 2017. “Teacher identity in the context of current school reforms in Kazakhstan.” *NUGSE Research in Education*, vol. 2, no. 2, pp. 3-12.

Kiili, C., Laurinen, L., & Marttunen, M. 2009. “Skillful Internet Reader is Metacognitively Competent.” In: L. T. W. Hin, & R. Subramaniam, eds. *Handbook of Research on New Media Literacy at the K-12 Level: Issues and Challenges* (Volume II). Hershey: Information Science Reference.

Knobel, M. & Lankshear, C. 2014. “Studying New Literacies.” *Journal of Adolescent & Adult Literacy*, vol. 58, no. 2: pp. 97-101.

Koehler, M. 2012. TPACK Explained [online]. Available at: https://matt-koehler.com/tpack2/tpack-explained/ (Accessed 28 March 2020), graph.

Kulakhmetova, A., McLaughlin, C., & Ayubayeva, N. 2014. “Preparing Teachers: an International review of the evidence of initial teacher education.” *Development of Strategic Directions for Education Reforms in Kazakhstan for 2015-2020*. Astana: NUGSE.

Kurakbayev, K. 2018. “International Transfer of Curriculum Innovations: lessons from primary curriculum renewal from Kazakhstan.” University of Albany - SUNY: CIES 2018 Northeast Regional Conference, 26-27 October. Albany: CIES.

Lee, W. O., & Tan, J. P.-L. 2018. “The New Roles for Twenty-First-Century Teachers.” In: H. Niemi, A. Toom, A. Kallioniemi, & J. Lavonen, eds. *The Teacher’s Role in the Changing Globalizing World*. Leiden: Koninklijke Brill NV.

Leibo, S. A. 2013. “The New Mongolia.” *Education About Asia*, vol. 18, no. 3, pp. 36-40.

Lenski, S. 2008. “Teaching from a Critical Literacy Perspective and Encouraging Social Action”. In: S. Lenski, & J. Lewis, eds. *Reading Success for Struggling Adolescent Learners*. New York: Guilford Press.

Leu, D. J., Forzani, E., Burlingame, C., Kulikowich, J. M., Sedransk, N., Coiro, J., & Kennedy, C. 2013a. “The New Literacies of Online Research and Comprehension: Assessing and Preparing Students for the 21st Century with Common Core State Standards.” In: S. B. Neuman, & L. B. Gambrell, eds., *Quality Reading Instruction in the Age of Common Core Standards*. Newark, DE: International Reading Association.

Leu, D. J., Kinzer, C. K., Coiro, J., Castek, J., & Henry, L. A. 2013b. “New Literacies: A Dual-Level Theory of the Changing Nature of Literacy, Instruction, and Assessment.” In: D. E. Alvermann, N. J. Unrau, & R.B. Ruddell, eds. *Theoretical Models and Processes of Reading* (6th ed.). Newark, DE: International Reading Association.

McVerry, J. G., Zawilinski, L., & O’Bryne, W. I. 2009. “Navigating the Cs of Change.” *Educational Leadership*, vol. 67, no. 1. Available at: http://www.ascd.org/publications/educational-leadership/sept09/vol67/num01/Navigating-the-Cs-of-Change.aspx (Accessed: 31 January 2019).

McWilliam, E. L. 2009. “Teaching for creativity: From sage to guide to meddler.” *Asia Pacific Journal of Education*, vol. 29, no. 3, pp. 281-.293.

Melkote, S., & Steeves, H. L. 2001. *Communication for Development in the Third World: Theory and Practice for Empowerment*. New Delhi: Sage.

Mendee, J. 2012. *Civil Society in a Non-Western Setting: Mongolian civil society*. Available at: www.academia.edu (Accessed: 31 January 2019).

Mishra, P., & Koehler, M. J. 2006. “Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge.” *Teachers College Record*, vol. 108, pp. 1017-1054.

Nazarbayev University Graduate School of Education. 2014. Development of Strategic Directions for Education Reforms in Kazakhstan for 2015-2020. Astana: Indigo.

Norwegian Ministry of Education and Research. 2004. *Stortingsmelding nr. 30 (2003-2004) Kultur for loering*. [White paper no. 30 (2003-2004) Culture for Learning]. UFD.

Ministry of Education, Culture, Science, and Sport. n.d. *National Curriculum for Basic Education in Mongolia*. Ministry of Education, Culture, Science, and Sport.

Ministry of National Economy of the Republic of Kazakhstan Committee on statistics. n.d. Available at: http://stat.gov.kz/faces/homePage?_adf.ctrl-state=j5l5wbdme_4&_afrLoop=127720257432062 (Accessed: 31 January 2019).

Mongolia at a glance. n.d. Available at: http://www.fao.org/mongolia/fao-in-mongolia/mongolia-at-a-glance/en/ (Accessed: 31 January 2019).

Mukashovna, M. S. 2013. "Kazakhstan: An Overview with Special Reference to Ethnic and Linguistic Dimensions." In: M. Ahmed, ed., *Education in West Central Asia*. London: Bloomsbury.

Murray, T. 2013. "Brief Overview of Social Deliberative Skills." AIED 2013 Self-Regulated Learning Workshop, Memphis: AIED.

Mynbayeva, A., & Anarbek, N. 2016. "Informatization of Education in Kazakhstan: New Challenges and Further Development of Scientific Schools." *International Review of Management and Marketing*, vol. 6, no. S3, pp. 259-264.

Nabi, Y., Zhaxylykova, N. E., Kenbaeva, G. K., Tolbayev, A., & Bakbaeva, Z. N. 2016. "Education Quality in Kazakhstan in The Context of Competence-Based Approach." *International Journal of Environmental & Science Education*, vol. 11, no. 10, pp. 3423-3435.

Niemi, H., Lavonen, J., Kallioniemi, A., & Toom, A. 2018. "The Role of Teachers in the Finnish Educational System: High Professional Autonomy and Responsibility." In: H. Niemi, A. Toom, A. Kallioniemi, & J. Lavonen, eds. *The Teacher's Role in the Changing Globalizing World*. Leiden: Koninklijke Brill NV.

OECD. 2014. *Reviews of National Policies for Education: Secondary Education in Kazakhstan*. OECD.

Opertti, R., Kang, H., & Magni, G. 2018. *Global Citizenship Education Tools and Piloting Experiences of Four Countries: Cambodia, Colombia, Mongolia and Uganda*. IBE-UNESCO/UNESCO APCEIU.

Primeminister.kz. 2018. *Digital Kazakhstan: current state of affairs and prospects for future*. [online] Available at: https://primeminister.kz (Accessed: 31 January 2019).

Selinger, M. 2009. "ICT in education: catalyst for development." In: T. Unwin, ed. *ICT4D: Information and Communication Technology for Development.* Cambridge: Cambridge UP.

Shayakhmetova, Z. 2017. "Digital Kazakhstan initiative presented at Web Summit 2017." *The Astana Times*. Available at: https://astanatimes.com/2017/11/digital-kazakhstan-initiative-presented-at-web-summit-2017/ (Accessed: 31 January 2019).

Steiner-Khamsi, G., & Stolpe, I. 2006. *Educational Import: Local Encounters with Global Forces in Mongolia*. New York: Palgrave Macmillan.

Stern, S. 2008. "Producing Sites, Exploring Identities: Youth Online Authorship." In: D. Buckingham, ed. *Youth, Identity, and Digital Media*. Cambridge: MIT Press.

Tapscott, D. 1998. *Growing up digital: The rise of the net generation*. New York: McGraw-Hill.

Tuul, S., Banzragch, O., & Saizmaa, T. 2016. “E-learning in Mongolian Higher Education.” *The International Review of Research in Open and Distributed Learning*, vol. 17, no. 2: n.p.

UNESCO. 2013. *UNESCO Country Programming Document For Mongolia 2012-2016*. Geneva: UNESCO.

UNESCO. 2017. *Mongolia Case Study on Accountability in Education*. Geneva: UNESCO.

Unwin, T. 2009. “Development agendas and the place of ICTs.” In: T. Unwin, ed. *ICT4D: Information and Communication Technology for Development.* Cambridge: Cambridge UP.

Uyanga, S. 2014. “Baseline Analysis on ICT In General Education of Mongolia.” *Informatics in Education*, vol. 13, no. 1, pp.121-140.

Van Doodewaard, M. 2004. “Mongolia: Who Bridges the Digital Divide?” *IIAS Newsletter*, vol. 33: no.12.

Weidman, J. C. 2002. “Developing the Mongolia Education Sector Strategy 2000-2005: Reflections of a Consultant for the Asian Development Bank.” *Current Issues in Comparative Education*, vol. 3, no. 2: pp. 99-108.

Weidman, J. C., & Yoder, B. 2010. “Policy and Practice in Education Reform in Mongolia and Uzbekistan during the First Two Decades of the Post-Soviet Era.” *Excellence in Higher Education*, vol. 1, pp. 57-68.

Wikiversity. 2018. Instructional design/SAMR Model/What is the SAMR Model? [online]. Available at: https://en.wikiversity.org/wiki/Instructional_design/SAMR_Model/What_is_the_SAMR_Model%3F [Accessed 28 March 2020], graph.

Wilson, D. N. 1994. “Comparative and International Education: Fraternal or Siamese Twins? A Preliminary Genealogy of Our Twin Fields.” *Comparative Education Review*, vol. 38, p. 4, pp. 449-486.

World Vision/OneHope. 2014. *Mongolian Youth Research Report*. World Vision/OneHope.

Yembuu, B. 2010. Mongolia. In: P. Peterson, E. Baker, & B. McGaw, eds. *International Encyclopedia of Education*, vol. 5. Oxford: Elsevier.