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ORIGINALNI NAUČNI RAD

Obrazovni sistem i nova normalnost u učenju

Education system and the new normal in learning

Rezime

Posljednjih godina na globalnom nivou značajna sredstva su uložena u digitalne učionice, uvođenje e-nastave i inovativne digitalne alate za učenje. Iako je to bio cilj većine škola i način da se unaprijedi kvalitet školskog sistema, kriza pandemije COVID-19 pokazala je drugačije stanje u školama. U praksi ovaj cilj nije postignut na zadovoljavajućem nivou, a škole još uvijek nisu spremne za potpuni prelazak na onlajn nastavu. U isto vrijeme, pred postojeći školski sistem postavlja se zahtjev reforme obrazovnog sistema – onog koji će osnažiti sve učenike da istražuju svoju prirodnu kreativnost, otkriju svoje prave vještine i oblikuju svoju budućnost, a uz pomoć primjene digitalnih instrumenata. Globalno obrazovanje kakvo je danas bori se sa zastarjelim nastavnim programom, s visokim troškovima i fizičkim prisustvom u učionicama. Poznati savremeni kurikulum zasnovan na kompetencijama treba da bude osnovno jezgro integrisano sa najboljim praksama iz cijelog svijeta, kako bi omogućio personalizovani, multidisciplinarni i svrsishodan obrazovni sistem. Fokus treba da bude na učenju sa zadovoljstvom, školi koja promovise dobrobit, izgradnju karaktera i njeguje cjeloživotno učenje. Kriza pandemije COVID-19 primorala je mnoge škole i univerzitete da se odmah prebace na onlajn predavanja. Mnogim nastavnicima bilo je teško da u tako kratkom vremenu obezbijede efikasna predavanja putem interneta i ostalih dostupnih medija. Time su škole širom svijeta bile primorane da obezbijede efikasna rješenja za izvođenje nastave u novonastaloj situaciji. U primjenjivim digitalnim rješenjima, predmeti zasnovani na znanju mogu se lako predavati onlajn, a sticanje vještina i kompetencija slično kao i u tradicionalnim učionicama. Sistem treba da se kroz personalizovano učenje fokusira na vještine koje će studentima biti potrebne za što lakše zaposlenje i tržište rada. Glavni cilj je pružanje unaprijeđenog, visokokvalitetnog i pristupačnog obrazovanja za sve. Pandemija COVID-19 ne treba da bude samo prepreka dostupnosti kvalitetnog obrazovanja, već i otvorena mogućnost za novi način učenja.

Ključne riječi: obrazovni sistem, kriza COVID-19, e-učenje, ishodi učenja.

Abstract

In recent years, significant resources have been invested globally in digital classrooms, the introduction of e-learning and innovative digital learning tools. Although this was the final goal of most schools and way to improve current school system, the crisis has shown different facts. In practice this has not been achieved at a satisfactory level and schools are not yet ready for this type of teaching. At the same time a request is made for the new educational system – it should empower all students to explore their natural creativity, discover their true passions, and shape their future through digital instruments. Global education as it stands today is struggling with outdated, high cost and location-bound education. The renowned competency-based, modern curriculum as basic core integrated with best practices from around the world should create a personalized, multidisciplinary, and purposeful educational system. This places a strong focus on learning with joy, a school that promotes well-being, character building and fosters lifelong learning. The COVID-19 outbreak has compelled many schools and universities to immediately switch to the online delivery of lessons. It was difficult for many teachers to develop effective online lessons in such a short period of time. The COVID-19 crisis forced schools worldwide to wake-up to the lack of working solutions to new delivery of education. In a new education solution, knowledge-based subjects can easily be taught online and skills and competencies in traditional classrooms. The system focuses through personalized learning on skills that the students will need in the worklife instead of making student memorize knowledge. The main goal is to delivery of future-ready, high-quality and affordable education for everyone. The COVID-19 crisis should allow us to use the window of opportunity opened and not only being the obstacles to new knowledge.

Keywords: Education system, COVID-19 crisis, e-learning, learning outcomes.

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UVOD

Posljednje godine, pa i decenije, bile su izazov i presudna raskrsnica u obrazovnom sektoru. Pokazalo se da je od suštinske važnosti poboljšati trenutni globalni obrazovni sistem, ali i inovirati ga u cilju obezbjeđenja kvalitetnog obrazovanja za buduće generacije. Kriza COVID-19 primorala je škole širom svijeta da shvate koji su nedostaci za izvođenje kvalitetne nastave u vrijeme kada se klasičnom učenju i školama u fizičkom smislu ne može pristupiti. Čak i prije pandemije COVID-19, Svjetska banka je u izveštaju iz 2018. godine identifikovala uzroke krize učenja.

Danas se svijet suočava sa globalnom krizom učenja u školama. Globalni obrazovni sistem kakav je danas, nalazi se u borbi sa zastarjelim načinom držanja nastave, visokim troškovima i neophodnim fizičkim prisustvom. Škole širom svijeta i dalje se usredsređuju na nastavno znanje koje učenici pamte, umjesto na savladavanje vještina koje su učenicima potrebne prilikom ulaska na tržište rada. Ono što nam danas treba jeste obrazovni sistem koji će se zasnivati na kompetencijama sa savremenim kurikulumom i koji će se primjenjivati i uz pomoć inovativnih digitalnih instrumenata.

COVID-19 primorao je vlade da ubrzano uvedu ili prošire programe učenja na daljinu, a pitanje koje se postavlja jeste da li su preduslovi stvoreni za takvu brzu primjenu kvalitetno uspostavljeni širom svijeta. Obrazovanje i obuka polako ali sigurno digitalizuju onlajn sadržaje, časove, ispite i udžbenike. Polje obrazovanja i obuke takođe se mijenja u pogledu organizacije i pedagogije. Sve više su potrebni različiti alati za e-učenje, jednostavni za upotrebu, i novo rješenje za korišćenje ovih mogućnosti koje nudi kontekstualno učenje za sve, bez obzira na lokaciju.

Nova normalnost u učenju treba da obuhvati prilagođene digitalne resurse i platforme za učenje, da svakom učeniku omogući personalizovano učenje (učenje vlastitim tempom i interesovanjem), da pokaže napredak, postignuća i kompetencije iz svih aktivnosti i učenja u školi i izvan nje, i da poboljša samosvijest učenika i razumijevanje njihovog puta dostignuća.

Obrazovanje je dugo bilo presudno za dobrobit ljudi, ali još je važnije u vremenu brzih ekonomskih i socijalnih promjena. Prije nego

što je COVID-19 zatvorio škole, svijet je već bio usred globalne krize učenja koja je ugrozila napore zemalja da izgrade ljudski kapital – vještine i znanja potrebne za buduće poslove. Podaci Svjetske banke i UNESCO-a pokazali su da 53% djece na kraju osnovnog obrazovanja u zemljama sa niskim i srednjim prihodima ima loše uslove i, posljedično, ishode učenja (Svjetska banka, 2019).

1. PREGLED LITERATURE

1.1. Karakteristike globalnog obrazovnog sistema

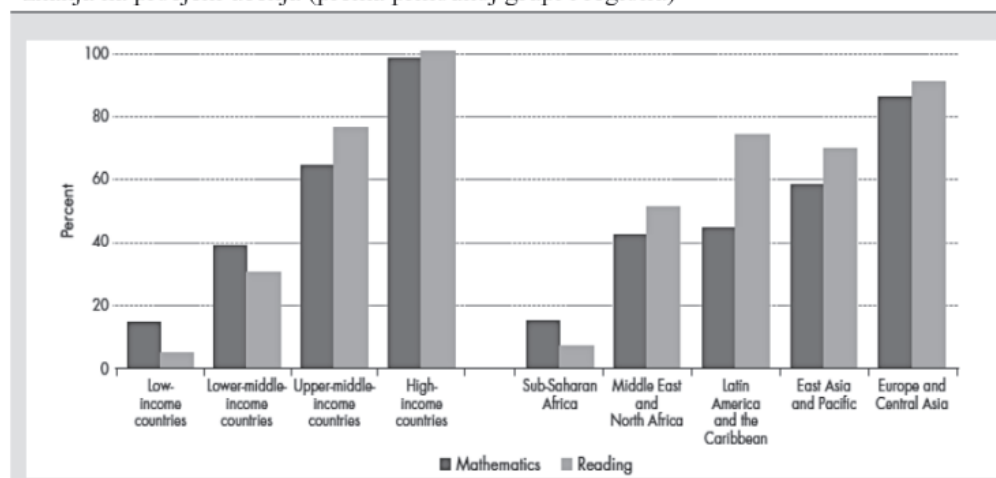
U izvještaju Svjetske banke za 2018. godinu identifikovani su uzroci krize učenja u školama, i to u tri osnovne dimenzije. U nastavku teksta ih izlažemo i analiziramo.

- 1) Loši ishodi učenja: nizak nivo znanja, velika nejednakost i spor napredak

Učenje koje bi trebalo očekivati u školama na osnovu formalnih programa ili izraženih potreba poslodavaca često se ne susreće u praksi. Još veća zabrinutost je što mnoge zemlje ne uspijevaju da obezbijede ni osnovno učenje za sve učenike. Pojedinci koji su već u nepovoljnom položaju u društvu zbog siromaštva, lokacije, nacionalnosti, pola ili invaliditeta, prema istraživanjima, imaju najmanje uslova za redovno učenje. Stoga obrazovni sistemi mogu proširiti socijalne praznine umjesto da ih sužavaju. U mnogim zemljama u razvoju tokom posljednjih nekoliko decenija, upis u obrazovanje nadmašio je istorijske pokazatelje današnjih najrazvijenijih zemalja. Na primjer, Sjedinjenim Državama je trebalo 40 godina – od 1870. do 1910. godine – da povećaju upis djevojčica sa 57 na 88 procenata. Broj godina školovanja koje je prosječna odrasla osoba završila u zemljama u razvoju više se nego utrostručio od 1950. do 2010. godine, sa 2,0 na 7,2 godine. Ovaj napredak znači da se većina praznina u upisu u osnovne škole smanjuje između zemalja sa visokim i niskim prihodima. Do 2008. godine prosječna zemlja sa niskim prihodima upisivala je učenike u osnovnu školu po skoro istoj stopi kao i prosječna zemlja sa visokim prihodima (Azevedo et al., 2020).

Slika 1. Procenat učenika osnovnih škola koji pređu minimalni prag znanja

Prosječni učenici u kasnoj osnovnoj školi koji su postigli ocjenu iznad minimalnog nivoa znanja na procjeni učenja (prema prihodnoj grupi i regionu)



Izvor: Izvještaj Svjetske banke za 2018. Dostupno na: <https://www.worldbank.org/en/publication/wdr2018>

2) Škole podbacuju učenike u očekivanjima

Trenutnim obrazovnim sistemima nedostaje jedan ili više od četiri ključna faktora za ostvarivanje boljih ishoda učenja. Prvo, djeca

često dolaze u školu nespriprema za učenje. U isto vrijeme, nastavnicima često nedostaju vještine ili motivacija da budu efikasniji. Nastavnici su najvažniji faktor koji utiče na učenje u školama (Ha-

INTRODUCTION

Recent years have been a challenge and a critical crossroads in education sector. It is of immense importance to try to improve the current education system, but also to innovate the new system that we strongly need for our next generation. The Covid-19 crisis forced schools worldwide to wake up due to the lack of a way to deliver quality classes at a time when classical and brick schools cannot be accessed. Even before the Covid-19 Pandemic the World Bank in a 2018 report identified this learning crisis.

We can say that world is facing a global learning crisis in schools. The global education system as it stands today is struggling with outdated, high cost and location-bound education. Schools around the world still focus on teaching knowledge that the students memorize instead of focusing on teaching skills that the students need when entering work life. What we need today is an education system that will be competency-based with modern curriculum and that will be implemented through innovative digital instruments.

COVID-19 has forced governments to rapidly introduce or expand distance learning programs and the question is whether the prerequisites created for such rapid implementation have been quality established worldwide. Still, as the pandemic has shown the core of education and training relies on physical presence in a classroom and moving towards remote or blended learning has been cumbersome. Education and training have slowly, but surely digitized through online content, exams and digital textbooks. The field of education and training is also changing with regards to organization and pedagogy. Now there is a need for easy to use, user-friendly e-learning tools and new solution to use this window of opportunity that offers contextual learning for everyone regardless of the location.

The new normal in learning should include customized digital resources and learning platforms, bring personalized learning to each student (learning at their own pace and interest), show the progress, achievements and competencies of students from all activities and learning inside and outside the school and to improve students' self-awareness and understanding of their learning path.

Education has long been critical to human welfare, but it is even more so in a time of rapid economic and social change. Before COVID-19 shut schools down, the world was already in the midst of a global learning crisis that threatened countries' efforts to build human capital - the skills and know-how needed for the jobs of the future. Data from the World Bank and UNESCO showed that 53% of children at the end of primary in low- and middle-income countries even suffer from learning poverty (World Bank, 2019).

1. LITERATURE REVIEW

1. 1. Global educational system characteristics

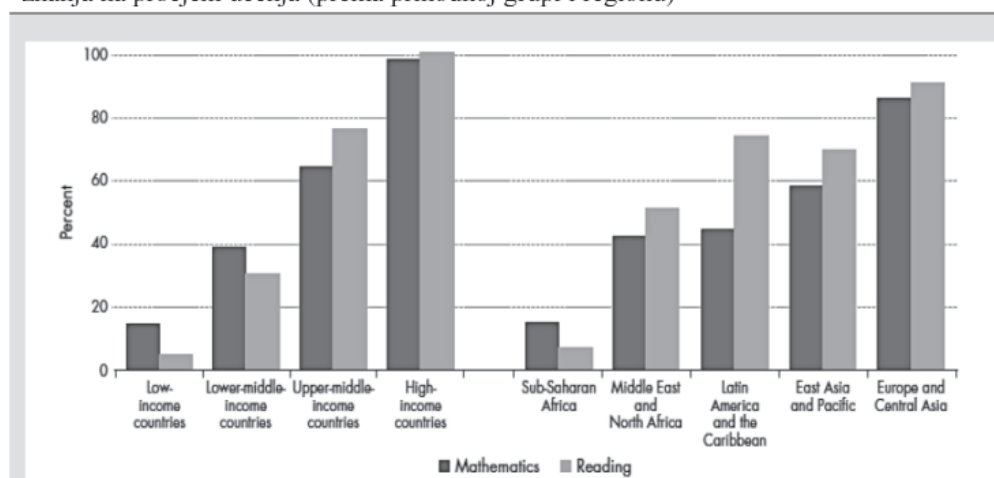
The World Bank 2018 Report identified learning crisis in schools and sorted them into three basic dimensions. In the further text we expound them and analyze.

1) *Learning outcomes are poor: Low levels, high inequality, slow progress*

The learning that could be expected in schools based on formal curricula or the needs of employers often does not happen. Of even greater concern, many countries fail to provide learning for all students. Individuals who are already disadvantaged in society due to poverty, location, nationality, gender or disability learn the least. Thus, education systems can widen social gaps instead of narrowing them. In many developing countries over the past few decades, net enrollment in education has far outpaced the historical performance of today's industrialized countries. For example, it took the United States 40 years - from 1870 to 1910 - to increase the enrollment of girls from 57 to 88 percent. The number of years of schooling completed by the average adult in developing countries more than tripled from 1950 to 2010, from 2.0 to 7.2 years. This progress means that most gaps in primary school enrollment are closing between high- and low-income countries. Until 2008, the average low-income country enrolled students in primary school at almost the same rate as the average high-income country (Azevedo et al., 2020).

Figure 1: The percentage of primary school students who pass a minimum proficiency threshold

Prosjeak učenika u kasnoj osnovnoj školi koji su postigli ocjenu iznad minimalnog nivoa znanja na procjeni učenja (prema prihodnoj grupi i regionu)



Source: World Bank Report 2018. Available on: <https://www.worldbank.org/en/publication/wdr2018>

2) *Schools fail students in expectations*

Secondly, struggling education systems lack one or more of four key school-level ingredients for learning. First, children often arrive in school unprepared to learn. At the same time, teachers often lack

the skills or motivation to be effective. Teachers are the most important factor affecting learning in schools (Hanushek, 2011). The acquisition of knowledge by students largely depends on teachers' creativity, ideas and readiness to transfer knowledge. Third, inputs

nushek, 2011). Sticanje znanja od strane učenika u velikoj mjeri zavisi od kreativnosti nastavnika, ideja i spremnosti za prenos znanja. Treće, inputi često ne uspijevaju da dođu do učionica ili da značajnije utiču na učenje. Posvećivanje i obezbjeđivanje dovoljno resursa za obrazovanje je presudno (Robinson, Lloid i Rove, 2008;

Vaters, Marzano i McNulti, 2003). Iako školsko rukovodstvo ne utiče direktno na podizanje kvaliteta učenja učenika, to čini posredno, poboljšavanjem kvaliteta nastave i obezbjeđivanjem efikasne upotrebe resursa. Loše upravljanje i neadekvatan obim sredstava za obrazovanje često podrivaju kvalitet školovanja.

Slika 2. Četiri glavna faktora lošijih rezultata u klasičnom učenju



Izvor: Izvještaj Svjetske banke za 2018. Dostupno na: <https://www.worldbank.org/en/publication/wdr2018>

3) Sistemi propadaju u školama

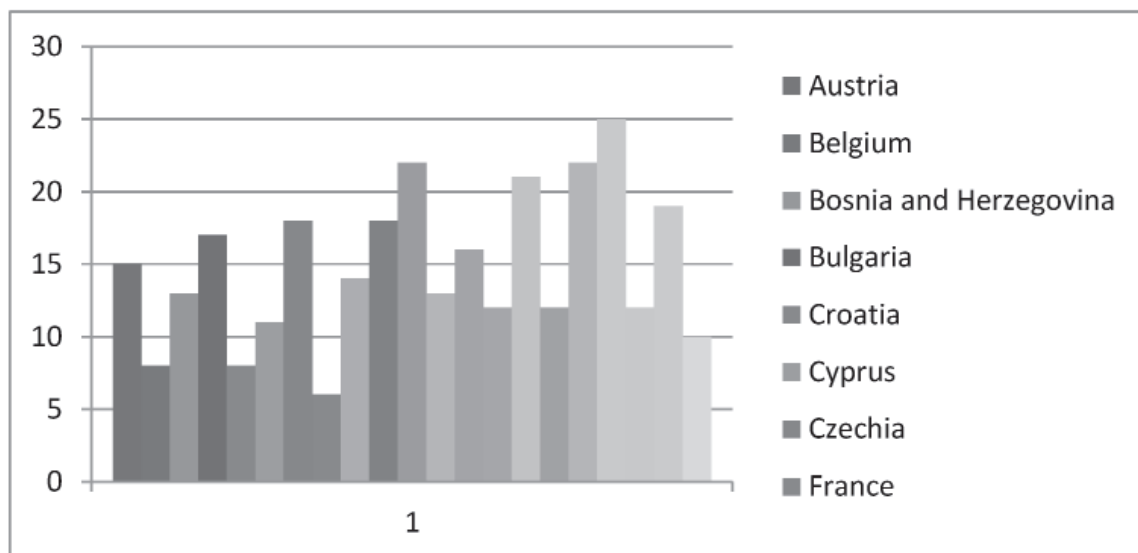
Tehnička složenost, administracija i politički uticaji često negativno utiču na obrazovne sisteme i učenje. Razni dijelovi sistema moraju biti usklađeni sa učenjem. Ali različiti akteri u sistemu imaju i različite ciljeve, a promovisanje učenja je samo jedan od njih. Nedostaci tokom školovanja na kraju se pokazuju kroz slabe vještine i kompetencije kada učenici stasaju za tržište rada. Budući da obrazovni sistemi nisu adekvatno pripremili buduće radnike, mnogi ulaze kao radna snaga sa neadekvatnim vještinama. Obrazovanje omogućava uzlaznu socioekonomsku mobilnost i ključ je za izbjegavanje siromaštva. Obrazovanje pomaže u smanjivanju nejednakosti i postizanju rodne ravnopravnosti i presudno je za podsticanje tolerancije i mirnijih društava. Globalni cilj je da svi steknu kvalitetno obrazovanje koje je temelj za poboljšanje života ljudi i održivi razvoj (Svjetska banka, 2018).

2. REZULTATI ISTRAŽIVANJA I DISKUSIJA

2.1. Pandemija COVID-19 i škole

Tokom prošle i ove godine svijet se bori sa neočekivanom i nevidljivom prijetnjom. Pod izazovom su se našli svi aspekti života, u suočavanju sa ekonomskim, humanitarnim i socijalnim posljedicama. Ipak, možemo reći da je ova kriza najviše pogodila obrazovni sistem. Zatvaranje škola zbog COVID-19 ostavilo je više od milijardu učenika van škole. Da bi se borile protiv COVID-19, više od 180 zemalja naložilo je privremeno ili potpuno zatvaranje škola, ostavljajući, na vrhuncu, početkom aprila, skoro 1,6 milijardi djece i omladine van škole. Do kraja maja 2020. godine, 20 školskih sistema se djelimično otvorilo, a oko 1,2 milijarde učenika ostalo je i dalje van škole (Svjetska banka, 2020).

Slika 3. Potpuno zatvaranje škola u odabranim evropskim zemljama zbog COVID-19 (izraženo u sedmicama)



Izvor: obrada autora, adaptirano sa UNESCO-ove globalne mape praćenja zatvaranja škola, <https://en.unesco.org/covid19/educationresponse>

often fail to reach classrooms or to affect learning when they do. Devoting enough resources to education is crucial (Robinson, Lloyd and Rowe, 2008; Waters, Marzano and McNulty, 2003). Although effective school leadership does not raise student learning directly,

it does so indirectly by improving teaching quality and ensuring effective use of resources. Poor management and governance often undermine schooling quality.

Figure 2: Four main factors of low results in classical learning



Source: Worldbank Report 2018. Available at: <https://www.worldbank.org/en/publication/wdr2018>

3) Systems are failing schools

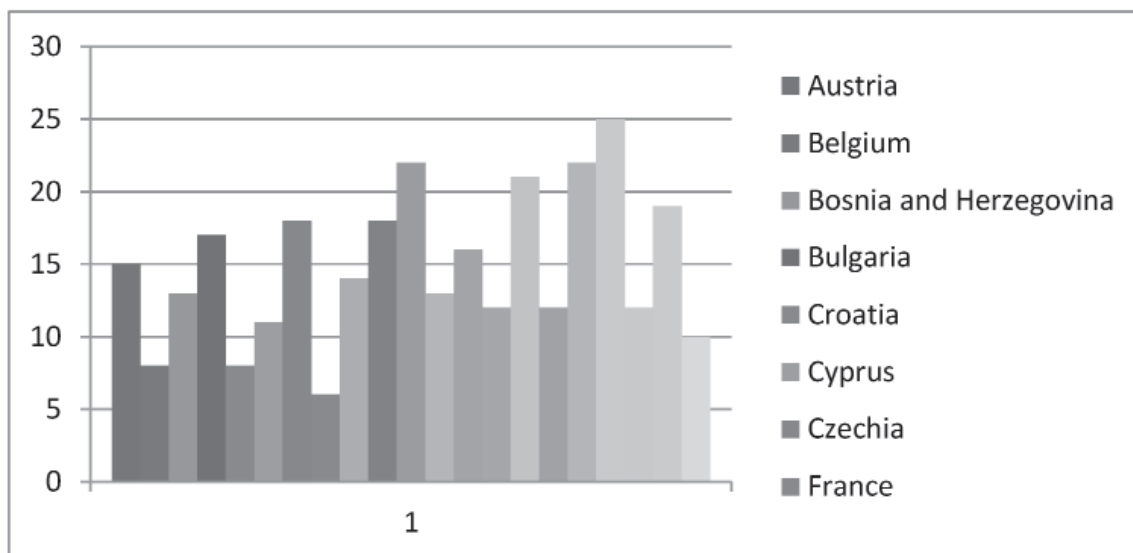
Technical complexities and political forces constantly pull education systems out of alignment with learning. The various parts of the system need to be aligned toward learning. But different actors in the system have other goals - some stated, some not. Promoting learning is only one of these, and not necessarily the most important one. Learning shortfalls during the school years eventually show up as weak skills in the workforce. Thus, the job skills debate reflects the learning crisis. Because education systems have not prepared workers adequately, many enter the labour force with inadequate skills. Education enables upward socioeconomic mobility and is a key to escaping poverty. Education helps reduce inequalities and reach gender equality and is crucial to fostering tolerance and more peaceful societies. The global target is for everyone to obtain a quality education which is the foundation for improving people's lives and sustainable development (World Bank, 2018).

2. RESULT AND DISCUSSION

2.1. Covid 19 & schools

During the past year the world is battling an unexpected and invisible threat. It challenged all aspects of life in dealing with economic, humanitarian and social consequences. The education sector is one of the most affected by this crisis. School closures due to COVID-19 have left more than a billion students out of school. To combat COVID-19, more than 180 countries mandated temporary school closures, leaving, at its peak in early April, close to 1.6 billion children and youth out of school. By the end of May 2020, 20 school systems had opened partially, and about 1.2 billion students remained out of school (World Bank, 2020).

Figure 3: Full school closures in selected Europe countries due to COVID-19 (in weeks)



Source: Author adaptation from the UNESCO global monitoring map of school closures <https://en.unesco.org/covid19/educationresponse>

Koje su procijenjene posljedice zatvaranja škola na duži period? Posljedice se mogu posmatrati sa više aspekata. Prije svega, neupitno je da je zatvaranje škola pomoglo sprečavanju širenja zaraze, i sa epidemiološkog stanovišta je potpuno opravdano. S druge strane, za sada se ne može reći da postoje određeni pozitivni efekti.

Zatvaranje škola može dovesti do skoka u broju napuštanja škole i dalje erozije u kvalitetu učenja. Prema autorima Aievedo i ostali (2020), povećane stope napuštanja škole jedan su od važnih kanala koji povezuju hitna zatvaranja škola i druge obrazovne poremećaje sa gubicima u prosječnom životnom postignuću. Generalno, kako djeca odrastaju, oportunitetni troškovi boravka u školi se povećavaju. To domaćinstvima može otežati opravdanje za slanje starije djece u školu nakon prisilnog prekida, posebno ako su domaćinstva pod finansijskim stresom. U epidemiji poliomijelitisa 1916. godine istraživači su pretpostavili da su djeca radnosposobnog uzrasta (13, u većini američkih država u to vrijeme) vjerovatnije napustila školu trajno nakon zatvaranja škola usljed te epidemije. Takvi efekti nisu ograničeni samo na iznenadne i neplanirane slučajeve u javnom zdravstvu. Smanjene stope upisa zabilježene su i u Indoneziji nakon ekonomskog prilagođavanja 1980-ih godina i turbulencija koje su se tada osjećale na tržištu.

Dokazi ukazuju na to da svaki prekid školovanja, uključujući planirane odmore, raspuste, može dovesti do gubitka učenja za mnogu djecu. Istraživanje Coopera i dr. (1996) otkriva da se u prosjeku rezultati uspjeha američkih učenika smanjuju za oko mjesec dana tokom tromjesečne ljetnje pauze. Kim i Kuinn (2013) otkrivaju da su ljetnim gubicima u kontinuitetu učenja posebno pogođeni studenti sa niskim primanjima. Slično tome, Alekander, Pitcock i Boulai (2016) otkrivaju da se oko 25 do 30 procenata učenja postignutog tokom školske godine gubi obično tokom ljetnjih praznika. Staviše, prekidi tokom kritičnih stadijuma školovanja mogu dovesti do mnogo lošijih ishoda. Na primjer, prekid tokom trećeg razreda, kada učenici savladavaju čitanje, može dovesti do veće stope napuštanja škole i lošijeg životnog standarda u budućnosti.

Neki od neželjenih efekata jesu i objektivno prisiljavanje roditelja mlađe djece da odsustvuju s posla, uzimaju slobodne dane da bi pratili nastavu s njima putem elektronskih medija i pomažu im da savladaju gradivo. Takođe, nedostupnost ili ograničenja interneta i medijskih sredstava komunikacije znatno otežavaju izvođenje onlajn vrste nastave.

Dugoročni efekti pandemije COVID-19 sada sugerišu da će posljedice biti značajne i trajne. Pored procjena neposrednih uticaja, u literaturi takođe nalazimo činjenice dugotrajnih posljedica šokova i roditeljske zabrinutosti zbog bezbjednosti u školama vezano za zarazne bolesti. Meiers i Thomasson (2017) dokumentuju da čak i nakon što su škole ponovo otvorene, mnogi roditelji nisu bili voljni da puste djecu da je pohađaju. Autori su otkrili da su mladi ljudi koji su tokom pandemije imali između 14 i 17 godina kasnije pokazali niže opšte obrazovanje u poređenju sa nešto starijim vršnjacima.

2.2. Učenje na daljinu i novo normalno u učenju

COVID-19 primorao je sve zemlje da uvedu onlajn predavanja ili da prošire programe učenja na daljinu. Idealni preduslovi za tako brzo uvođenje novog sistema učenja nisu obezbijedjeni u svim zemljama.

Strategije ublažavanja u vrijeme COVID-19 često se nazivaju učenje na daljinu – ono se izvodilo na različite načine: putem domaćih zadataka na papiru, programima na televiziji, radiju, preko mobilnih telefona, tekstualnih poruka i, svakako, uz internet podršku. Ono što se postavlja kao aktuelno pitanje jeste efikasnost tako oštrog prelaska na alternativne modalitete učenja tokom zatvaranja škola, u odnosu na dosadašnje klasično učenje.

2.2.1. Učenje na daljinu

Zvanične informacije o pandemiji COVID-19 ukazuju na to da je pogođeno više od milijardu djece širom svijeta (UNESCO). Djeca širom svijeta imaju veoma različite načine učenja dok su škole zatvorene. Obrazovni sistemi ovo pokušavaju da ublaže pružanjem učenja na daljinu. Učenje na daljinu pruža priliku učenicima i nastavnicima da ostanu povezani i angažovani sa nastavnim sadržajem dok rade od kuće. Mogućnosti za učenje na daljinu su obično povezane sa vanrednim situacijama koje predstavljaju prijetnju za sigurnost učenika i nastavnika.

Ovaj način predavanja razlikuje se od virtuelne škole ili programa virtuelnog učenja. Oni obično predstavljaju zvanični proces osnivanja škole, usvajanja mrežnog kurikuluma i stvaranja posebne strukture za podršku učenicima upisanim u školu. E-učenje koristi elektronske tehnologije za pristup obrazovnom programu izvan tradicionalne učionice. Struktura učenja na daljinu određuje uspjeh učenika i nastavnika sa iskustvom. Učenje na daljinu često kod učesnika izaziva dodatni stres, pa je važno ne dodavati više dužnosti nastavnicima i učenicima od redovne nastave. Da bi učenje na daljinu bilo efikasno, mora postojati dobro razvijena struktura koja će moći da podrži definisani kurikulum.

Kao što pokazuje praksa, glavni problem i razlike između škola i država postoje u odnosu na dostupnu tehnologiju. Tehnologija se može razlikovati u improvizovanim okruženjima za učenje na daljinu. Ako škole dozvoljavaju učenicima da nose mobilne aparate ili laptope iz kuće, tada bi učenici trebalo da dolaze spremni za učenje. Neke škole nemaju uređaje koje učenici mogu ponijeti kućama, pa učenici moraju da pronađu načine za pristup materijalima obezbijeđenim kroz tehnološke sisteme. Škole koje do sada nisu imale učenje na daljinu ili virtuelno učenje, moraju da obezbijede alternativne načine za učenike da primaju i vraćaju zadatke. Škole moraju da pruže vrlo jasne informacije o tome kako da pristupe bilo kojoj mrežnoj platformi tokom učenja na daljinu, posebno ako učenici, roditelji i nastavnici nisu navikli da redovno koriste takve alate. Tehničku podršku takođe treba da obezbijedi u cijelo okruženje, a ne samo da bude odgovornost nastavnika, koji drži nastavu na daljinu. Jasne informacije koje opisuju korake za rješavanje problema i kontakt informacije za dodatnu tehničku podršku trebalo bi da budu lako dostupne svima.

Učenje na daljinu nikada nije toliko efikasno kao nastava u učionici. Teško je kognitivno angažovati djecu sa svim distrakcijama u domaćinstvu, uređaji moraju da se dijele između braće i sestara, a porodicama može biti teško da prate cijeli televizijski program. Staviše, pristup televiziji ili internetu, glavnim kanalima pružanja učenja na daljinu, uglavnom je nejednak. Na sljedećem grafikonu možemo vidjeti procjenu dostupne tehnologije za učenje na daljinu u BiH za 2016. godinu, prije pandemije virusa korona.

Slika 4. Raspoloživa tehnologija za učenje na daljinu u BiH

Assets for remote learning in Bosnia and Herzegovina				
COVID-19 education indicators		Year	Source	Value
Households with Internet access	Total	2016	UNICEF Databases	50%
Households with personal computer	Total	2016	UNICEF Databases	45%

Izvor: UNICEF (2020), Education and COVID-19. Dostupno na: <https://data.unicef.org/topic/education/covid-19/>

What are the consequences of closing schools for a longer period? The consequences can be viewed from several aspects. First of all it is unquestionable that it helped prevent the spread of the infection and from the epidemiological point of view it is completely justified. On the other hand we do not have positive effects. School closures may lead to a jump in the number of dropouts and an erosion of learning.

According to the authors Ayevedo et al. (2020), increased dropout rates are one important channel linking emergency school closures and other educational disruptions to losses in average lifetime educational attainment. In general, as children age, the opportunity cost of staying in school increases. This may make it harder for households to justify sending older children back to school after a forced interruption, especially if households are under financial stress. In the 1916 polio epidemic, researchers hypothesize that children of legal working age (13 in most U.S. states at that time) were more likely to leave school permanently following epidemic-related shutdowns. Such effects are not restricted to public-health emergencies. Reduced enrollment rates were also observed in Indonesia after economic adjustment in the 1980s.

Evidence indicates that any interruption in schooling, including scheduled vacations, can lead to a loss of learning for many children. Cooper et al. (1996) find that, on average, U.S. students' achievement scores decline by about a month's worth during the three-month summer break. Kim and Quinn (2013) find that students from low income background are particularly affected by summer learning loss. Similarly, Alexander, Pitcock, and Boulay (2016) find that around 25 to 30 percent of learning achieved over the school year is typically lost during summer holiday periods. Moreover, interruptions during critical schooling stages of life can lead to much worse outcomes. For example, an interruption during third grade, when students are mastering how to read, may lead to higher dropout rates and worse life prospects including poverty.

Some of the side effects are forcing parents of younger children to be absent from work, taking days off to follow classes with them through electronic media, and helping them master the material. Also, the unavailability or limitations of the Internet and media means of communication make it significantly more difficult to conduct this type of teaching.

The long-term effects of COVID-19 now suggest that consequences will be large and lasting. Beyond estimates of immediate impacts, the literature also provides some insights on the long-lasting impacts of shocks and resulting parental concerns around school safety. Meyers and Thomasson (2017) document that even after schools reopened, many parents were reluctant to let their children attend. The authors found that young people who were aged 14-17 during the pandemic, later showed lower overall educational attainment compared to slightly older peers.

2.2. Remote learning and new normal in learning

COVID-19 has forced the government to rapidly introduce or expand distance learning programs and it is unlikely that the ideal preconditions for such a rapid introduction have been established around the world. Mitigation strategies at the time of COVID-19 are often referred to as distance learning – it was delivered in different ways: homework sheets on paper, radio, TV, mobile phones, text messages and the In-

ternet, both directed by an instructor and self-propelled. What is being raised as a topical issue is the effectiveness of the sharp transition to alternative learning modalities that governments provide during school closures.

2.2.1. Remote learning

The officially identified pandemic of COVID-19 is impacting more than billion children worldwide (UNESCO). Students around the world are having very disparate ways of learning as schools are closed. Education systems try to mitigate this by providing remote learning.

Remote learning provides an opportunity for students and teachers to remain connected and engaged with the content while working from their homes. Opportunities for remote learning are typically linked to emergency situations that pose a threat to student safety. Transitioning to remote learning can keep students on track to complete a work and to be ready for any scheduled assessments. Many of the requirements in a traditional classroom environment will be in play for remote learning environments, and the goal is to adhere to as many state and local requirements as possible.

This way of teaching is different from a virtual school or a virtual learning program. They usually represent the official process of establishing a school, adopting an online curriculum, and creating a special structure to support students enrolled in school. eLearning uses electronic technologies to access an educational program outside the traditional classroom. The structure of distance learning will determine the success of students and teachers with experience. Distance learning is often called in times of stress, so it is important not to add more duties to teachers and students. For distance learning to be most effective, there must be a well-defined structure that will be able to support a well-developed curriculum.

As practice shows, the main problem and differences exist from the available technology. Technology can vary in improvised distance learning environments. If schools allow students to carry home appliances, then students should be ready to learn. Some schools do not have devices to send home, so students must find ways to access the materials provided through technology systems. Districts that do not typically engage in distance learning or virtual learning in their traditional calendars must provide alternative ways for students to receive and return assignments. Schools need to provide very clear information on how to access any online platform during remote learning, especially if students, parents and teachers are not accustomed to using such tools on a regular basis. Technical support also needs to be provided throughout the district and not be the responsibility of the teacher, who will have enough to keep up with in the remote learning environment. Clear information describing steps for troubleshooting and contact information for additional technical support should be easily available for everyone.

Remote learning is never as effective as classroom instruction. It is hard to keep children engaged cognitively with all the distractions in the household, devices have to be shared between siblings, and it can be hard for families to decipher television programming. Moreover, access to a television or internet the main channels of delivering remote learning is highly unequal. In the following graph we can see the estimate of accessible remote assets technology in BiH for 2016, before virus crisis.

Figure 4: Remote assets technology in BiH

Assets for remote learning in Bosnia and Herzegovina				
COVID-19 education indicators		Year	Source	Value
Households with internet access	Total	2016	UNICEF Databases	50%
Households with personal computer	Total	2016	UNICEF Databases	45%

Source: UNICEF data (2020), Education and COVID-19. Available at: <https://data.unicef.org/topic/education/covid-19/>

Prema najnovijim podacima iz UNICEF-ovog izvještaja, u mnogim zemljama sa nižim prihodima mogućnosti onlajn učenja imaju ograničenu dostupnost. Ne samo da mnogim domaćinstvima nedostaju internet veze, već i kada su dostupne, one možda neće biti dovoljno brze za preuzimanje. Pored toga, domaćinstva možda nemaju računar ili možda nemaju dovoljan broj za upotrebu roditeljima i djeci ili za više djece. Ako u obrazovnim politikama nedostaju informacione tehnologije, osnovni uslovi koji omogućavaju povezanost, pristup uređajima, kvalitetan sadržaj, praćenje i podrška, izostaju, a nastavnici i učenici neće imati minimalne uslove da integrišu tehnologiju za podršku njihovom učenju. Uspješna strategija učenja na daljinu oslanja se na višestruke pristupe putem interneta. COVID-19 je pokazao da postoji digitalni jaz i razlike koje nesrazmjerno utiču na siromašne zemlje i siromašne zajednice u zemljama. Za zemlje sa visokim prihodima, efikasnost ublažavanja može se kretati od 15% do 60%, što takođe odražava i veći pristup domaćinstvima tehnologiji i očekivanu efikasnost onoga što se nudi. U zemljama sa nižim i srednjim prihodom, taj razmjer se kreće od 7% do 40%, jer je pristup domaćinstava računarima, internetu i mobilnim telefonima znatno bolji. Efikasna upotreba digitalne tehnologije vođena je ciljevima učenja i poučavanja, a ne određenom tehnologijom. Nova tehnologija ne dovodi automatski do većeg postignuća. Istraživanja su pokazala da obrazovne promjene ne odgovaraju situaciji u kojoj nastavnici i učenici mogu jednostavno zamjeniti učenje uz pomoć računara i tradicionalno učenje na bilo kom nivou i sa istim rezultatom (Bettinger i ostali, 2020).

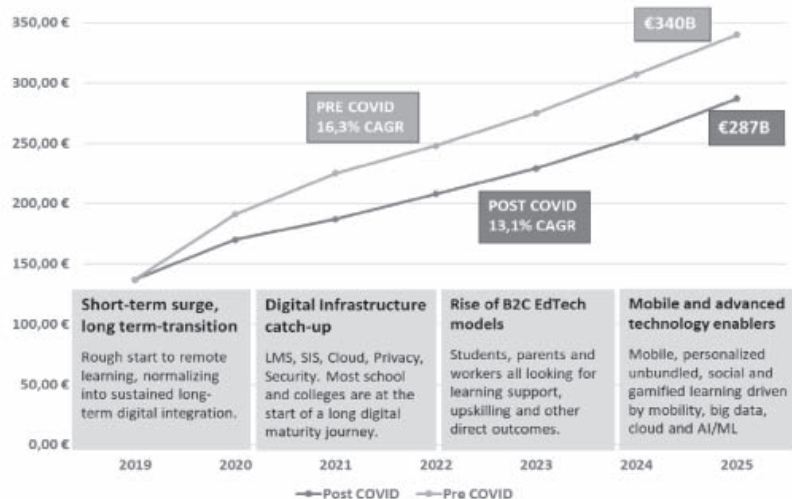
Motivacija učenika da koriste tehnologiju ne znači uvijek i efikasnije učenje, posebno ako upotreba tehnologije i željeni ishodi učenja nisu usko povezani.

2.2.2. Nova normalnost u nastavi i e-učenje

Pandemija COVID-19 pokazuje da škole globalno nisu bile i još uvijek nisu pripremljene za isključivo onlajn inovativno obrazovanje putem e-učenja. Oštar prelazak na novi oblik nastave primorao je škole da shvate potrebu za učenjem na mreži i ubrzao je prihvatanje onlajn i inovativnih modela nastave. Ovo treba gledati kao priliku da nova škola postane „novo normalno“ u obrazovanju. Osnova za prelazak na digitalnu nastavu, kako za postojeće, tako i za nove modele, jesu šira očekivanja potrošača vezano za tehnologiju, a u pogledu mobilnosti, personalizacije, socijalnog i gamifikovanog učenja. Učenje putem interneta, iz perspektive tržišta, ima dovoljno prostora za kontinuirani rast čak i izvan pandemije.

Tržište ulaganja u infrastrukturu obrazovanja procjenjuje se na 9.000 milijardi evra, a rast iznosi 4,9% CAGR¹ i procjena je da će dostići 16.000 milijardi evra do 2030². Privatne investicije, digitalizacija i novi načini rada služe kao pokretači rasta ovog tržišta. Trenutno je manje od 3% globalnih troškova za obrazovanje povezano sa tehnologijom. Međutim, očekuje se da će se digitalna potrošnja brzo povećati jer se predviđa njen porast na 342 milijarde dolara do 2025. godine. Broj stanovnika kontinuirano raste, a zemlje intenzivno ulažu u obrazovanje.

Slika 5. Globalni izdaci za ulaganje u tehnologiju obrazovanja, milijarde USD



Izvor: HolonIQ, 2020³. Dostupno na: <https://www.holonIQ.com/notes/global-education-technology-market-to-reach-404b-by-2025/>.

Očekuje se da će se kratkoročni rast potrošnje na tehnologiju koja se koristi u nastavi, a do koje je došlo usljed COVID-19, proširiti na dugoročnu integraciju digitalnih tehnologija i prelazak na mnogo veće usvajanje onlajn obrazovanja tokom narednih godina. Dio ove tranzicije uključuje značajnu infrastrukturu potrebnu za upravljanje učenjem, podacima i administracijom, jer je većina škola i fakulteta još uvijek na samom početku dugog digitalnog putovanja. EdTeh modeli su u porastu kako studenti, roditelji i nastavnici sve više traže podršku u učenju, savladavanju gradiva i usavršavanju za dodatne i direktnije ishode učenja i rezultate.

Da li će učenje putem interneta postati novo normalno u post-COVID svijetu? Kriza je efikasno ubrzala dugoročne strukturne promjene u načinu na koji studenti uče. Ove promjene bismo vjerovatno vidjeli u narednih nekoliko godina i bez krize, ali činjenica je da nova si-

tuacija ima značajan uticaj. Možemo prepoznati nekoliko prednosti e-učenja. Prije svega, pristup učenju za sve učenike – bilo kada i bilo gdje. Širenje pristupa na načine koji dramatično smanjuju troškove pristupa kvalitetnim obrazovnim resursima i iskustvima, na udaljenim lokacijama ili u situacijama kada izazovi poput slabog upisa učenika čine tradicionalni školski model nepraktičnim.

Tradicionalne škole se još uvijek ne fokusiraju dovoljno na upotrebu tehnologije kao mogućnosti učenja. Bolje korišćenje vremena nastavnika i učenika automatizacijom rutinskih zadataka omogućava nastavnicima da se fokusiraju na aktivnosti visoke vrijednosti. Činjenica je da mnoge države sa niskim i srednjim prihodima nisu mogle da pruže podršku svim studentima tokom pandemije COVID-19, pa je neophodno svim učenicima obezbijediti kvalitetan pristup obrazovanju. Takođe, personalizovano učenje nadovezuje

¹ Složena godišnja stopa rasta (CAGR – Compound annual growth rate) mjeri stopu povraćaja za investiranje preko perioda investiranja, najčešće pet ili 10 godina.

² Goldman Sachs, The Future of Learning: Transforming Education in the digital era (2019).

³ HolonIQ je industrijska platforma koja pruža podatke i analizu razvoja na svjetskom tržištu obrazovanja.

According to the latest data from a UNICEF report, in many lower-income countries, online learning options have limited utility. Not only do many households lack internet connections, but when available, these may not be fast enough for downloading. In addition, households may have no computer or, might not have a sufficient number for the parents and children to use, or for multiple children to use. If ICT in education policies lack the basic enabling factors (connectivity, access to devices, quality content, and teacher training, monitoring, and support), it is more likely that teachers and students will not have the minimum conditions to integrate the technology to support their learning. A successful remote learning strategy relies on multiple delivery approaches. COVID-19 has exposed the digital divide and the differences that disproportionately impact poor countries and poor communities within countries. For high-income countries, mitigation effectiveness could range from 15% to 60%, also reflecting both greater household access to technology and the expected effectiveness of what is offered. In lowermiddle and upper-middle income countries, the ability of governments to mitigate this shock may be higher, ranging from 7% to 40%, since household access to computers, the internet, and mobile phones are significantly better.

Effective use of digital technology is driven by learning and teaching goals rather than a specific technology. New technology does not automatically lead to increased attainment. An important finding is that educational production does not appear to fit a situation in which teachers and students can simply substitute between computer assistive learning and traditional learning at any level with the same result (Bettinger et al., 2020). Students' motivation

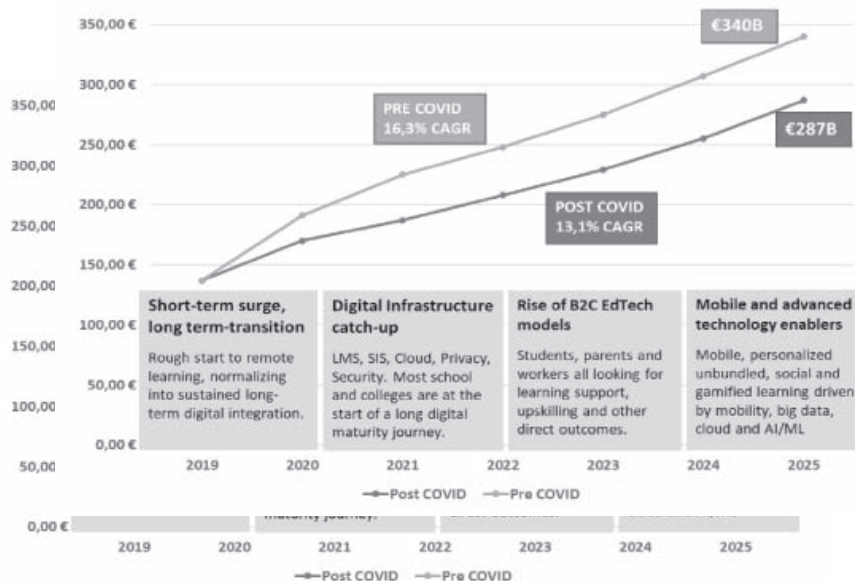
to use technology does not always translate into more effective learning, particularly if the use of technology and the desired learning outcomes are not closely aligned.

2.2.2. Impact of new normal and e-learning

The Covid-19 Pandemia proves that schools globally have not been and still are not prepared for online or innovative education through e-learning. The sharp transition to a new form of teaching has forced them to understand the need for online learning and has accelerated the acceptance to online and innovative models. This should be seen as an opportunity for a new school to become the "new normal" in education. The basis for the transition to digital, for both existing and new models, are the broader expectations of consumer technology in terms of mobility, personalization, social and gamified learning.

Online learning, from a market perspective, has ample room for continued growth even beyond the pandemic. Education is estimated over €9000B industry, growing at CAGR¹ 4.9% reaching €16000B by 2030.² Private investments, digitalisation and new ways of working serve as market growth drivers. Currently, less than 3% of global education expenditure is technology related. However, the digital spend is expected to increase rapidly as it is forecasted to grow to \$342b by 2025. The population is growing and the countries in the regions are heavily investing in education. Especially the private school sector is growing rapidly, but investments still result in an outdated way of teaching and organizing education.

Figure 5: Global EdTech expenditure, USD billions



Source: HoloniQ, 2020³. available on: <https://www.holoniq.com/notes/global-education-technology-market-to-reach-404b-by-2025/>

The short-term increase in EdTech spending brought on by COVID-19 is expected to widen to a longer-term integration of digital technologies and transition to much higher adoption of online education over the coming years. Part of this transition includes significant infrastructure required for managing learning, data and administration as most schools and colleges are still at the very start of a long digital maturity journey. EdTech models are on the rise as students, parents and workers increasingly seek learning support and up-skilling for supplemental and more direct academic and career outcomes.

Will online learning become the new normal in a Post-COVID World? The crisis has effectively accelerated long-term structural changes in the way students learn. We would probably see these changes in the next few years even without the crisis, but the fact is that the new situation has significant impact. We can recognize several benefits of e-learning. First of all, access to learning for all students – anytime and anywhere. Broadening access in ways that dramatically reduce the cost of access to quality educational resources and experiences, in remote locations or situations where challenges such as low student enrolments make the traditional school model impractical.

¹ Compound annual growth rate (CAGR) is the rate of return that would be required for an investment to grow from its beginning balance to its ending one.
² Goldman Sachs: "The Future of Learning: Transforming Education in the digital era" (2019)
³ HoloniQ is an industry intelligence platform that provides data and analysis of developments in the global education market

se na studentska interesovanja, što može rezultirati povećanom motivacijom, smanjenim vremenom potrebnim za rješavanje zadataka i na kraju boljim ishodima učenja.

Na kraju, sa pomenutim razvojem alata za e-učenje i digitalnim učenjem, neophodno je prilagoditi nastavni plan i program koji je spreman za budućnost i usredsrediti se na učenje kako učiti. Kurikulumi koji ne prate trendove i nove potrebe tržišta uzrokuju loše ishode učenja. Očekuje se da će škole i vlade smanjiti troškove obrazovanja i poboljšati održive ishode učenja. Inkluzivno obrazovanje koje pruža pristup učenju za svako dijete i omladinca bez obzira na to sa kojom se poteškoćom može suočiti.

Uprkos ovim prednostima, nedavna istraživanja Hewa i ostalih (2020), putem anketiranja 11.141 članova fakulteta iz 131 američke institucije pokazuje da samo 9% fakulteta više voli da predaje u potpunosti onlajn. Drugim riječima, ostalih 91% koledža ne želi da predaje u potpuno umreženom okruženju. Mišljenja studenata o potpuno onlajn predavanjima nisu mnogo bolja. Nedavno studentsko istraživanje koje je sproveo EDUCAUSE na više od 40.000 studenata na 118 američkih univerziteta pokazalo je da čak 70% ispitanika generalno ili potpuno preferira okruženja za učenje licem u lice, dakle klasičnim predavanjima (Gierdovski, 2019).

Onlajn učenje je često stigmatizovano kao slabija opcija koja pruža obrazovanje nižeg kvaliteta od učenja licem u lice (Hodges i dr., 2020). Stoga mnogi studenti ne vide vrijednost sveobuhvatnog učenja isključivo na mreži, uprkos činjenici da onlajn učenje u određenim oblicima postoji već decenijama.

ZAKLJUČAK

Obrazovanje predstavlja unutrašnju vrijednost, koja omogućava pojedincima da ostvare svoje pune potencijale u svim oblastima života. Ono ima presudnu ulogu u njihovom intelektualnom, moralnom, društvenom, kreativnom i fizičkom razvoju i promovisanju osnovnih socijalnih i građanskih vrijednosti, kao što su jednakost, tolerancija, poštovanje, društvena angažovanost i jačanje socijalne kohezije. Potreba za novim vještinama i kompetencijama zahtijeva od pojedinca doživotno učenje kako bi mogao odgovoriti na dinamične promjene zahtjeva na tržištu rada. Funkcionalna znanja i vještine, motivacija za učenje, stavovi i vrijednosti neophodne za formiranje nacionalnog i kulturnog identiteta neophodni su za aktivan i konstruktivan život u savremenom društvu.

Ubrzan tehnološki razvoj postavlja nove izazove za sve nivoe obrazovanja, a međupovezanost obrazovanja sa ekonomskim, političkim i kulturnim razvojem jednog društva postaje izraženija. Unapređenje kvaliteta obrazovanja ima suštinski značaj jer se smatra presudnim za razvoj inovativnosti, međunarodnu konkurentnost i ekonomski razvoj jedne ekonomije. Da bi se u nacionalnoj privredi ostvarila ekonomska isplativost obrazovanja, neophodno je uskladiti obrazovne programe i tržište rada, obezbijediti primjenjiva znanja i vještine, posebno iz razloga transformacije tradicionalnog koncepta privređivanja u sferu digitalnog poslovanja.

Izbijanje pandemije COVID-19 primoralo je mnoge škole i fakultete da se odmah prebace na onlajn predavanja. Čak i kad su bile dostupne mrežne alternative, nastavnici i učenici širom svijeta suočavali su se sa poteškoćama u smislu pristupa, sadržaja i kvaliteta e-učenja ili čak pristupa internetu. Zatvaranje škola može dovesti do povećanja stope napuštanja škole, jer postoji značajna veza između prekida nastave i drugih obrazovnih poremećaja sa gubicima u prosječnom životnom postignuću u obrazovanju. Usljed krize izazvane virusom korona, pokazala se snažna potreba za novim

obrazovnim modelom koji će biti „novo normalno“ kao rješenje za škole širom svijeta. Rješenja za digitalno učenje mogu ponuditi zanimljive mogućnosti za korišćenje multimedijalnih informacija i primjenu akademskih i profesionalnih vještina za rješavanje stvarnih problema i situacija koje se mogu povezati, simulirati ili izraziti kao virtuelna stvarnost u školama.

Nemogućnost fizičkog pristupa školi ili radnom mjestu ne bi trebalo da spriječi obrazovanje i razvoj vještina. U osnovi novog normalnog je vjerovanje da učenik uči kroz interakciju sa svojom okolinom, bilo da je to fizičko ili digitalno okruženje. Iako se očekuje da će ulaganje u obrazovanje u svijetu neprestano rasti, očekuje se da će internet tržište rasti mnogo bržim tempom. Tehnologija se može koristiti za masovnu personalizaciju obrazovanja i poboljšanje ishoda učenja; radi se na interesovanjima učenika, što rezultuje povećanom motivacijom, smanjenjem vremena izvršenja zadataka i, na kraju, boljim ishodima učenja.

Cilj održivog razvoja za kvalitetno obrazovanje za sve treba da obezbijedi sveobuhvatno i pristupačno rješenje za učenje, a e-učenje takođe pomaže da se postigne cilj da se značajno poveća broj mladih i odraslih sa odgovarajućim vještinama, neophodnim za tržište rada. COVID-19 primorao je države da razviju pametnije i održive strategije za pružanje kvalitetnog obrazovanja za sve, omogućavajući djeci da uče bilo gdje i u bilo koje vrijeme. Uvažavajući potrebu i važnost predavanja uživo i licem u lice, neizbježno je prilagoditi novu normalnost i prema e-učenju koje je složen proces, ali ovaj proces je takođe neophodan za poboljšanje nivoa kvaliteta obrazovanja i poslije COVID-19 pandemije.

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Traditional schools still do not focus enough on the use of technology as a learning opportunity. Better use of teacher and student time by automating routine tasks allows teachers to focus on high-value activities. The fact is that many low- and middle-income countries have not been able to provide support to all students during the Covid-19 pandemic, so it is necessary to provide quality access to education for all students. Also, personalized learning builds on student interests, which can result in increased motivation, reduced task time, and ultimately better learning outcomes.

Finally, with the mentioned development of e-learning and digital learning tools, it is necessary to adjust the curriculum that is ready for the future and focus on learning how to learn. Curriculum that does not follow trends and new market needs cause poor learning outcomes. Schools and governments are expected to reduce education costs and improve sustainable education outcomes. Inclusive education that provides access to learning for every child no matter what disability they may face.

Despite these advantages, recent research by Hew et al. (2020), shows surveys of 11,141 faculty members from 131 U.S. institutions found that only 9% of faculty prefer to teach entirely online. In other words, a whopping 91% of colleges don't want to teach in a fully networked environment. Students' opinions about completely online lectures are not much better. A recent student survey conducted by EDUCAUSE on more than 40,000 students at 118 U.S. universities found that as many as 70% of respondents generally or completely prefers face-to-face learning environments (Gierdowski 2019).

Online learning is often stigmatized as a weaker option that provides lower quality education than face-to-face personal learning (Hodges et al. 2020). Therefore, many students do not see the value of comprehensive learning exclusively online, despite the fact that online learning has existed for many decades.

CONCLUSION

The importance of education as an integral element of quality life and a key driver of sustainable development has clearly increased globally. Capacity in education for sustainable development can be developed through various modalities, such as face-to-face training, professional exchanges, online courses as well as introducing digital learning solutions. Education and training have slowly, but surely digitized through online content, exams and digital textbooks. Still, as the pandemic has shown the core of education and training relies on physical presence in a classroom and moving towards remote or blended learning has been cumbersome.

The outbreak of COVID-19 has forced many schools and colleges to immediately switch to online delivery of lessons. Even if online alternatives are available, teachers and learners around the world struggled with usability, content and quality of e-learning or even with access to internet. School closures could lead to increased dropout rates since there is important link between school closures and other educational disruptions with losses in average lifetime educational attainment. This highlights the importance of increasing the readiness of education systems to teach children at the right level. Covid-19 was a wake-up call for the strong need for a new education model that will be the "new normal" education solution to schools worldwide. Digital learning solutions can offer engaging opportunities for utilising multimedia information and applying academic and vocational skills to solving real work problems and situations that could be connected, simulated, or expressed as virtual reality in schools.

Inability to physically access a school or a workplace should not prevent education and skills development. At the core of new normal is a belief that pupil learn through interacting with their environment, whether that environment is physical or digital. While education spend in the world is expected to grow constantly the online market is expected to grow with much more rapid pace. Through integrating technology and adopting various blended learning models, the capital intensity of delivering education can be lowered substantially. Technology can be used to scale the mass personalization of education and improve outcomes of learning; it builds on student interests, which result in increased motivation, decreased time on task, and ultimately better learning outcomes.

The sustainable development goal for quality education for all, and through offering a cheap and accessible learning solution, e-learning helps to reach the goal of substantially increasing the number of youth and adults who have relevant skills, including technical and vocational for employment, decent jobs and entrepreneurship. COVID-19 has compelled countries to develop smarter and sustainable strategies for delivering quality education for all, enabling children to learn anywhere and in any time. While respecting the need and importance for live and face-to-face lectures, it is inevitable to adapt a new normal in e-learning which is complex process, but this process is also necessary to improve education both during and after the COVID -19 pandemic.

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