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Introduction to Human Capital Investigation in Kazakhstan. Designing Courses to Teach School Children to the Self-Learning Skill

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Abstract

Goals and objectives of the research: To raise awareness about maintaining self-learning skill for the students of schools and their parents in order to investigate into human capital. The objective is to identify the advantages, disadvantages of blended learning in Math classes at schools with Kazakh linguistic groups and find out the proper implementations considering culture and perception of Kazakhstani families of the middle class.

Mixed methods such as surveys and experimental classes were used.

Results/Findings: The self-learning skill is not developed in a majority of the students, however, there are bunch of problems related to this obstacle. Starting from the technological limits and internet access, ending with the not sufficient developments of the content for Kazakhstan's students online.

Novelty/Originality/Value: The work with the students is performed in a relatively short period of time (3 months) by conducting classes. This is the first research done in ordinary comprehensive school and in Kazakh linguistic group on the usage of digital resource in English within the class of Kazakh linguistic Math class.

Theoretical or Practical Implications: The results of the experiment can be related to the primary data. The implication of the research can be used in conducting experiments in other schools to identify the tendencies of students in raising self-

learning skill to invest into the human capital and its perspectives in economic sphere which includes education.

Keywords: education, economic growth, human capital, teaching methods, adaptation of methods to teach and learn.

Introduction

In the XXI century the world is changing into more informational environment where the capital of the country can be distinguished by intellectual features of human. The situation with lockdowns that had a place from 2020 in most of the countries is showing the importance of changing an approach to teach and study. The century of globalization is making big changes in the economics of countries; thus, it affects policies governments are making.

This article's topic is dedicated to the blended learning method used abroad to teach and learn Mathematics. According to UNCIEF (2020) due to COVID-19 lockdown, about 190 countries decided to close schools for quarantine which affected 1.5 billion children and young people, so in Kazakhstan the schools and the staff with students shifted offline classes to online classes too. Mostly there were 10-minute videos by channels on television and radio on each topic every day from company Bilimland (www.bilimland.kz). However, the teachers were sending the assignments and receiving the answers, and the main duty of them were giving feedback and assessing the works of students. This is not the main and important function of the teachers as we stated in chapter one, because teachers first of all need to up bring the students to motivate them learn deeper, to learn how to research and ask questions.

The research question of this research is about why effective digital resources in the face of Khan Academy (in English) not implemented into Mathematics classes in Kazakh common schools. The experimental observation in the school of Almaty (common comprehensive school) was conducted from January 27 and till Apri l

18. In the process of observation, it was found that limited access to the technologies, internet connection and pedagogy approach on teaching Mathematics in English were the main challenges in this experimental class. However, in the lockdown situation, the government solved the issues with the technology and access to the internet connection. And even when there was a problem of internet in different points of the country, it was solved by translating study videos on main channels of television. So, children were able to watch the tutorials and explanations through the TV channels. Digitalization of the Mathematical course came spontaneously with the help of government and paid websites like "Bilimland" and new "DarynOnline" with Kazakh content on several subjects with interactive videos. We can assume, when there is a strong need in using digital resources to teach and learn, all the resources can be found if there is a great force from the Ministry of Education and Science. However, the problem of attitude towards the internet learning of Mathematics by students, parents and teachers is still the issue to work on due to novelty in the traditional classrooms.

Before conducting the research, we analysed and compared the researches done in Chile by Light and Pierson (2014), because of the similarities in the schooling system. In that research we have identified other challenges to prepare for and could identify the possible solutions for our experiment at school. Additionally, we outlined the advantages of using Khan Academy in Math classes. In the second part of the second chapter we described the experiment and surveys conducted during the practice work of the master student.

By the end of the research we have defined that it is very hard to use online learning of Mathematics with CLIL method in English in Kazakhstan's common schools, especially in Kazakh forms effectively, but still it is possible. However, during the experiment we were taking notes for solving occurring problems related to the studies and the feedbacks from the students itself. Those notes can be used as guidance for making new experiment for Mathematics groups. Also, we took notes on the improvement of students who voluntarily took the part in this experiment

to improve the results on Mathematics test. The results of progress saved on the website of Khan Academy but secured for private issues.

Tasks were completed. 1) We examined the effectiveness of e-learning with partial substitution of teacher in the classroom both in developing and developed countries with the similar researches. As in the USA, the usage of Khan Academy had a good impact on the learners and teachers, because there were more volunteer participants. What about developing countries like Kazakhstan and Chile, the challenges of technological equipment were existing, also the attitude of students towards e-learning was quite out of trust. Overall, the good results were shown in the improvement of 11 grader student who voluntarily participated in faculty classes to work on gap in knowledge of Mathematics.

2) The questionnaire for parents and caregivers of the students in the focus group was also distributed. We have found out, that majority of parents these days do not help students with their home assignments or difficult topics. But those who help, they explain the concept by themselves, with the help of specialists or apps with solutions. However, it showed that parents mostly do not use internet and technologies to learn independently from school, but dependent on the textbooks and opinions of specialists who are available through the social platforms.

3) In the process of application of the methods used in the research for daily basis, we have deduced several ways of improvements that can be recommended to make affordable and free education for everyone within our circumstances of 2019-2020. They are written in the Chapter III in the section of recommendations and findings. Also, the challenges that can be constrained by the limits of the school financing or scheduling the classes.

Nowadays, it is possible to move freely online and offline from one university/study groups to another in order to gain specific skills and knowledge in need. The online platforms are creating new approaches to study, and the legacy of admission of

certificates become more flexible than ever, so everyone who has a desire and need to learn - able to do it in every corner of the country and the world. However, in Kazakhstan it is popular to study offline rather than online at schools and universities. That is the possible opportunity to raise awareness on gaining a skill on how to learn and teach online for the further usage by students and teachers to have advantage in investigation into human resources.

Literature Review

The definition of human capital first appeared in the works of the economist Theodor Schultz (1961) and it compares the developed countries with countries of the third world. There is written that undeveloped countries have natural resources, land as also main capital for economic growth, but human capital as a knowledge. By widening the knowledge people can choose in way more options, so the needs will be satisfied and then the country might have a proper working system by deviation.

This term of human capital is revised and reviewed several times, so the recent official definition for it is written in the United Nations (2009) that it is a productive wealth incorporate in skills, knowledge and labour. This might be acquired through formal and informal education. This might include the education as a self-awareness (including health issues related questions, wellbeing by understanding financial education and so forth) and gaining skills and knowledge itself. Thus, the knowledge and understanding how things work can affiliate the main sustainable development goals to fight against hunger, poverty, inequality, and then grow economically and become stable in political way. Because creating new and more opportunities will increase a demand on skilled and educated labour, which might be beneficial for the sustainable economic growth that is different from economic development (United Nations, 2015).

The human capital can be measured by Human Development Index (HDI) which is mostly and directly influenced by education. Kim (2010) wrote that education plays

crucial role for the labour in handling a new technologies and approaches by being flexible and professional.

As Professor Schultz (1963) explained, education is needed not just for moral and cultural satisfaction in learning, but it also plays more important role in building human capital starting even from the kindergarten and ending with professional trainings.

The educational reforms in Kazakhstan as explained (Zhanguzhinova, Magauova, & Nauryzbaeva, 2016) are creating new methods and approaches to become student-centred at schools and higher educational systems, so the students will be able to gain skills and knowledge related for modern needs. Thus, it is considered to learn how to learn through the digital resources and not being attached to the location of the resident as a dependence.

The impact of Human Capital on economic growth was also researched by Angui Macham (2015) and the findings inform us that there might be a link between human capital and economic growth. So, this idea can be applied to research in qualitative method for the further studies in the case of Kazakhstan.

According to Diego Lanzi (2004) in his paper Capabilities, Human Capital and Education, the well designed and developed educational policies may influence the several aspects of educational profits for the human capability. He wrote that development in educational policies will influence not only professional skills, but also skills for the life as reasoning, interpersonal/intrapersonal relationships, working within the group considering the peers' points of views and so forth. We think it is an advantage of educational provision to make Education for all considering the needs of the students and teachers, and especially local needs.

Also, the importance of teaching how to learn and interact matters more than scores of the test on the finishing of the school or classes. We should shift the focus

of the teaching methods not on just getting higher points on Mathematics, but we need to teach students to cooperate, be compatible in subject matter and to gain skills that will be helpful for the further researches, entrepreneurship and so forth.

According to the report of UNDP on Capacity Development (UNDP, n.d.) the criteria to measure the capacity development can be divided into three levels: individual level, organizational level and enabling level. The idea of implementation of this point is to increase the effective methods in each level. For example, teaching how to learn effectively and be cooperative, then giving chances by creating organizations to gather people with ideas to change economics based on local needs (starting with regional problems) and then supporting with a reforms and other policies that will be encouraging such activities. In the end we will have social active entrepreneurs raised from the school or kindergarten that help in the local growth and then in country's economic growth.

Returning to the education, we should input the idea of multiple intelligence of Gardner (Lane, C., n.d.) into the everyday working style of each teacher, so the students will study in a safe environment and with their own way of learning style. However, to come for this result we need to prepare resources which means teaching skills for educating strong minds. Mostly, the good quality workshops or classes are designed on the feedbacks of majority who are practicing the learnt materials. So, that is why the content of the classes that are changing based on the feedbacks is ca be considered as good quality too, we assume.

In this paper we are going to expand the individual level comprehension. Because we should identify are the schools ready to change the learning methods or not yet. And stakeholders of this process are teachers, students, administration and parents.

Methods

The research was conducted in mixed approach: literature review, survey and conducting experimental class in order to identify the local needs of the students

and parents. The case study is related to common Kazakhstan's school (Kazakh linguistic form) in Almaty by conducting a survey how children's attitude towards learning way (of mathematics) and then trying to recreate blended learning class. Mixed methods are used in this research, because the factors needed to be recorded from several perspectives and taking into consideration the availability to collect the data. First is the conduction of experimental classes with school students on learning with the help of digital resource in the face of Khan Academy in English. The second is surveys on the learning preferences of the students to study Mathematics and survey on parents' approach of helping the child to study.

Sample

There were studied 25 students of 7th grade and 2 students of 11th grade. 7 graders were learning Mathematics with the help of Khan Academy in required way, whereas the 11 graders came to the new faculty class voluntarily to close the gaps in knowledge. We also asked parents of the students on helping to the students with Math and their way usage of internet for learning. They were surveyed voluntarily. In the classwork was used for the first-time online platform named Khan Academy to conduct math classes in English with tutorials and assignments in there.

Research questions of this paper:

- *What is the connection between education investment and economic growth?*

To have an employee who would be able to work at special places we need more than (at least) 13 years or 18 years (10 or 12 years of school, then college or university for 4 years or 7 years for medical university, and then master degree for 2 years and postgraduate studies prolong for 3 years) to prepare and train employee to start a career. The quickest way is to hire a professional abroad. However, we should consider the problems that are related to unspoken or unwritten culture of locals. Because still in Kazakhstan we might have the cases of racism, ethnicity conflict problems and other problems related to differentiation of societies or individuals. Also, we should take into account the cases when the nation wants to keep its

"purity of blood lines" which can consist of saving the culture from the foreign influences.

There is another question for this sub-question: if the country's nation has literacy level above 95%, then could this fact predict the economic success of that country? The answer is - it is complicated, because people who only finished a school cannot have a high-paid job due to skills and specific systematic knowledge, so most of them have to work in a low position job, even if they know all the program of the school. It is still not enough to work on tolerance of the older generation, thus younger generation (their children, siblings, grandchildren, other relatives and social ties).

- *What can be changed to raise properly new human capital that can be perfect to do job in homeland?*

We assume based on literature review, that students who learnt several skills and gained a knowledge to use it for solving problems of local systems, markets and so forth can be more successful than the foreigner who wants to implement the same method which worked effectively in developed country. The tendencies in the local place are more understandable in intellectual and sometimes instinctive way to the person who raised in that area than just adapting a methods and social development programs without knowing and understanding the culture and way of thinking of the local people.

Thus, it would be better to raise the open minded and well-rounded individuals to help to create small businesses in the beginnings and then encourage in governmental level with policies. Still there is a need to explain to individuals the need in self-learning to improve skills needed to change the local life into the better one if there are problems. The individuals and groups should not just rely on the government, because not all 100% of the individuals use the opportunities given by government because sometimes, they are just not ready to act.

- *How new approach can change the students' attitude toward self-learning and blended learning?*

A new approach of learning due to governmental quarantine which is online teaching, might have an effect to open new ways to learn in customized path and time to learn new programs in a high quality. For example, UNESCO published list of useful sources on their official webpage, so kids who were able to understand and use English for learning could get differentiated content from all over the world (2020). Also, it might raise the self-determination of human capitals for the further studies.

The skills that are generating productivity can be compatible against of traditional way of lecturing and learning/studying. The influence of informational society can change the understanding of pragmatic skills and knowledge above the educational system writes Becker and Murphy (2003).

Data Collection

Starting with the first survey, there were approached 27 students, but answered for 100% only 12 of them. 8 of them were girls and 4 boys. The questions were as following:

Which of the following methods are the easiest way to learn new concept in mathematics? The answers were: reading the textbook, listening the explanation of a teacher, doing practice works and watching how to solve the problems. The answers had to be given the 5 places, where 1 means "I like this method most" and 4 "I do not like this method at all". Most of the answers that took number 1 related to the method of practice on your own how to solve a problem. Least desired method was related to reading a textbook where most respondents chose to put 3, 4, 5.

And the other interesting question related to the educational quality was "How do you think, what is the most inconvenient obstacle in studying mathematics". The

answers were: “Not having a sufficient enough time to learn”, “Not being able to recall the last topics related to new topic”, “The method of teaching of the teacher”, “The lack of problems to solve”, “the lack of feedback on problems and the ways how they are solved”.

The answers had the same meanings as the previous one where 1 means agreeing most and 5 means agreeing least. So, the children chose to give number one as “Not being able to recall the last topics related to new topic”. the number two is considered as “Not having a sufficient enough time to learn”, what about less agreed (5) it is “The method of teaching of the teacher”.
The next survey is conducted with the parents of the students in the focus group. The 19 respondents mostly women and parents of 7 graders. They had asked several questions, and there are some of them:

1. Have you ever hired a tutor for mathematics? The answers: 63.2% - no, 36.8 - yes.
2. Have you ever used online websites and platforms to learn how to solve similar problem on mathematics? Answers: 57.9% - no, 42.1% - yes.
3. And there was a question how frequently they were using a website. The answers of respondents: 52.6% - never, 21.1% - sometimes once in a week, 15.8% - very rare once or twice in a month, 5.3% - every time, 5.3% - sometimes.

Mostly parents and children were using YouTube and Khan Academy for learning purposes, and other rest of the parents encouraged to use Kazakh platforms as Bilimland. There were section with their own answers, so respondents answered they do not use exactly one website or do not use it, some of the respondents openly told they are using app called Photomath.

The results of the experiment with using Khan Academy with 7 graders showed, that not all of the students ready to use online platforms and electronic devices to study and to connect to internet. The 7th grade has enrolled to Khan Academy class as 28 students, where 12 students never used the app to do assignments. And from the 11th grade there were 2 students where only one of them were using actively the app to study Khan Academy.

Findings and Discussion

It is important to note, that researcher (author) was leading the research in pedagogical way at school, so the results might be narrow related to teaching and studying mathematics. However, in a parallel way we were monitoring the results from reports on how many minutes each student spend in the Khan Academy (www.khanacademy.org) during learning concepts and what were their attitude when they faced the problem that they could not solve (did they use hints, passed with several tries or skipped).

In the research we have faced findings from the results of the experiment:

1) There is a need to educate parents to internet literacy. The parents influence to the coherence of the students on points to use modern technologies as the peers. If parents will be in the same direction as teacher of Mathematics, then the flow from offline class to blended learning class will be smoothly held in and out of the classroom.
2) Learning Mathematics for students mostly associated with the instructions on how to solve the equations and other problems. The survey results showed, that students mostly learn from the demonstration of the problem's way of solution rather than working in a group and listening to the lectures. This explains why the teacher in the class plays several roles, starting from the manager, administrator, leader, instructor and ending as a lecturer.
3) The finding that English as a language to study Mathematics crushed (with 7 graders), because it was impossible to flow in the short time of period into completely English environment in the class. The students need a proper explanation in Kazakh to learn faster how to solve Mathematical problems, that is why they were not interested in studying the subject in other language and consume time and energy to learn language rather than Mathematics. It was related to time issues at school and schedule that does not allow to work more than 40 minutes per day. Also, it was dependent on the students' thoughts on their marks and points, as well as control summative and formative assessments where they must show their knowledge on curriculum topics in Kazakh. So, there

was no opportunities to demonstrate the benefits of using English in Kazakh classes at that moment. Although, English is widely used language in the world and majority of the new information comes with this language first.

Although, the results of students using Khan academy shows us that they started to spend more time on doing assignments on Mathematics with visual progress. As students told in the class, they do not afraid of making mistakes (and get low scores or points from the teacher) while solving equations, but they are disappointed to earn less points when they cannot solve something right in a row. However, instead of 40 minutes every day of Mathematics, students were spending more than an hour to challenge themselves and each other by sharing their scores and gained skills to solve problems quicker than they were doing. The students of faculty also mentioned that they could learn Mathematics after the school and with feedback, and they started to understand and use English for Mathematics. In the test from the Ministry of Education and Science the 11th grader Nursultan Nurmaganbet (personal communication, May 13, 2020) was able to prove his that the points earlier on Math he reached were 5 on Math and about 15 on Math literacy, and in March he got 16 on Mathematical literacy and 23 on Mathematics itself. From this we can assume that this method should be approved in the faculty classes on Mathematics with volunteers rather than in Mathematics class where a lot of obstacles can be the challenge to conduct a proper research.

Possibilities to make this research different and more successful:

1) It will be beneficial to work with more than one researcher for the one classroom to conduct a research, because in most of the computer classes, students need the instructor and the assistant.
2) There will be questions regarding to the processes, so the researchers or teachers need to be ready to manage class effectively. They expected to know the subject, English and the aim of the research.
3) To design surveys with contacts of each asked student/parent/teacher, so it can be used for the further interviews or clarifications on some points to interpret

the answers right. The survey design should be improved and asked to encourage interviewee to complete the survey for 100%.

4) It will be beneficial to conduct a parallel research on how using blended or distance learning approach might influence on student's improving the skills on time management, self-learning independence and so on which are not related to Mathematics but related to personal effectiveness.

This research accidentally turned to the best option of using distance learning tools due to COVID-19 lockdown. However, in the peaceful time, the results might be worse. However, with this research now we have more opportunities to gain data from several sources to analyse what helps to students to stay on streak while learning Mathematics with digital resources and what kind of tutorials are engaging for the students of Kazakhstani schools.

Significance of the Study

It is the first case study with the experiment on students of Kazakh (speaking) classes to use English platform to learn mathematics and see the results. The results for 2020 is quite less developed, but the results of the using the content and language integrated learning is good as expectations for the first time. Most of the students proved that they are learning more than they were studying in traditional classes, because they could use their free time to learn by competing with each other rather than spending it to other not productive activities. Also, students mentioned that they are using English to study Mathematics and by repetitive commands of tutor in the video they did fine job on learning new words and phrases for everyday use. This means those children who were using continuously the platform improved their language in natural way and also improved the understandings of some Mathematical concepts. However, the problems of the study were about lack of researchers and lack of devices and internet access in the classroom. Mostly students were studying in our online class from home. Although, the new informational environment which is developed by quarantine due to COVID-19 is giving more opportunities to students to have access to online classes and courses

with a teacher. So, it might be a great opening research article for those who are going to research the effectiveness and role of (online) education to gain skills, knowledge for productive encouragement to study and become new qualified human capital of the economics of Kazakhstan. The education out of curriculum might trigger the learning more and deeper to widen choices for every new generation and might lead to economic growth by having in a capital sufficient professional.

The results of the research can be used in different ways. Firstly, as a starting point for the new research related to implementation of digital resource in English in Mathematics class. Because this thesis paper consists of the pioneer walkthrough route which explains what kinds of problems will be facing the teacher and how to solve those problems. The teachers or researchers can contact by creating a network to study implementation of digital resource in English in Mathematics class for Kazakh or Russian language groups to create more reports for the future insights. Secondly, the scientists or researchers can use my report for their studies in qualitative and quantitative research how it is implementing in other school in Kazakhstan.

Conclusions

Firstly, the education and human capacity has a close tight relationship to influence economic growth in gaining sustainable development by fighting against poverty starting in local regions and hunger, leading to equality between people and many more. Therefore to increase the capacity the overall works should be done in 3 levels, starting from individuals that are ready to get the new skills which will be helpful for professional and personal growth, and ending with reforms that will take into consideration the needs of the groups of locals. This would be beneficial if the reforms are working for nation and individuals who are using opportunities within the country.

Secondly, the research shows that local views on using digital resource in foreign language to get the information for free and in a high quality was quite

unpredictable. Children can work with resources, but there is a lack of technologies or access to the internet to cover all 100% children. Also, the perception of the internet by parents and their children as a entertainment and social interaction source is quite devastating, because this might stack the progress of learning through the internet to get a degree or skill.

Lastly, the quarantine is opening a new approach to teach and learn how to study by itself through the gaining of learning and research skills. This is beneficial to have a new generation that will have a critical and analytical skills to work with big data and enormous information. This time students will be leading by teachers and will have encouragements from parents by staying at home and learning through digital platforms.

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