

**Emergency Remote Education at a Kazakhstani Private University:
Identifying e-learning competencies and measuring student preparedness for
compelled distance learning**

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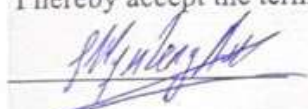
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Emergency Remote Education at Emergency Remote Education at a Kazakhstani Private
University: Identifying e-learning competencies and measuring student preparedness for
compelled distance learning
has been approved by the Graduate School of Education Ethics Committee of Nazarbayev
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Yours sincerely

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Abstract

For the last year, education has changed a lot due to the COVID-19 pandemic. Local universities were forced to shift from a traditional on-campus mode of lesson delivery to distance learning. In a short period, students were isolated from social lives and were stuck in front of computer screens to take courses through the internet. In this regard, the purpose of this study is to determine students' most required e-learning competencies for compelled distance learning at first, and then, based on identified necessary competencies, to study students' actual preparedness for that. The identification of the aforementioned e-learning competencies for their subsequent correlation with the academic performance during distance learning, might become a starting point in the further investigation of the problem.

If so, I planned a mixed method case study with a holistic approach to investigate this issue. I conducted focus group discussion with 10 university stakeholders in the face of students, teaching staff, and administration members. Also, I send anonymous web-based surveys to the whole students' population and teaching staff at one private university in Kazakhstan, receiving 1436 responses from students and 43 from teachers. The research questions that lead this study are: (1) What are the students' primary e-learning competencies required for effective performance during compelled distance learning? (2) To what extent students from one private university in Kazakhstan rate their preparedness for compelled distance learning? (3) To what extent does teaching staff from one private university rate students' preparedness for compelled distance learning? (4) Is the relationship between e-learning competencies and students' academic performance significant? (5) Is there a difference in the preparedness level of students of different genders, faculties, and years of study for emergency remote education?

Findings showed that students of one private university in Kazakhstan are well-prepared for emergency remote learning. Both students and teachers highlighted difficulties

related to balancing work, social life, family and remote studies. Furthermore, students reported all time-management related competencies equally challenging. Along with that, it was found that there is a significant correlation between e-learning competencies and academic performance, which means that students who possess well-developed e-learning skills tend to have higher GPA results during online semester. Connectedly, significant differences in preparedness for distance learning were found between males and female students, where females indicated their competencies comparatively higher than males.

Based on the results of the study and the unprecedented COVID-19 pandemic, it is suggested to consolidate training for learners prior to the beginning of the academic year to advance satisfaction with a distance learning environment.

Аңдатпа

Соңғы бір жылда COVID-19 пандемиясының салдарынан білім беру саласы қатты өзгерді. Жергілікті университеттер сабақ берудің дәстүрлі режимінен қашықтықтан оқытуға көшуге мәжбүр болды. Қысқа мерзім ішінде студенттер қоғамдық өмірден оқшауланып, компьютер экранының алдында оқуға және Интернеттегі сабақтарға қатысуда өздерін тапты. Осыған байланысты, бұл зерттеудің мақсаты алдымен білімгерлердің мәжбүрлі қашықтықтан оқыту кезеңіндегі ең қажетті электронды білім дағдыларын анықтау, содан кейін анықталған құзыреттіліктерге сүйене отырып, студенттердің қашықтықтан оқытуға нақты дайындығын зерттеу болып табылады. Жоғарыда аталған электрондық оқыту құзыреттіліктерін, білімгерлердің қашықтықтан оқыту кезінде академиялық көрсеткіштермен өзара байланысын анықтау, әрі қарай зерттеудің бастапқы нүктесі бола алады.

Егер солай болса, мен бұл мәселені тергеуге біртұтас көзқараспен аралас әдісті зерттеу жүргіздім. Мен университетке қатысы бар 10 адаммен, оның ішінде студенттермен, оқытушылар құрамымен және әкімшілік мүшелерімен фокус-топтық пікірталас өткіздім. Сонымен қатар, бір жеке университеттің студенттері мен оқытушыларына анонимді интернет-сауалнамалар жібердім, студенттерден 1436 жауап, ал оқытушылардан 43 жауап алдым. Осы зерттеудің негізіндегі сұрақтар төмендегідей: (1) мәжбүрлі қашықтықтан оқытуда жетістікке жету үшін қажетті электрондық оқыту дағдылары қандай? (2) Қазақстандағы бір жеке университеттің студенттері қашықтықтан оқуға дайындығын қаншалықты бағалайды? (3) Жеке университеттің профессорлық-оқытушылық құрамы студенттердің қашықтықтан оқуға дайындығын қаншалықты бағалайды? (4) Электрондық оқыту құзыреттілігі мен білімгердің оқу үлгерімі арасындағы байланыс бар ма? (5) әр түрлі жыныстағы,

факультеттегі және оқитын жылдардағы студенттердің мәжбүрлі қашықтықтан оқытуға дайындық деңгейінде айырмашылық бар ма?

Нәтижелер көрсеткендей, Қазақстанның бір жеке университетінің студенттері мәжбүрлі қашықтықтан оқытуға жақсы дайындалған. Студенттер де, оқытушылар да жұмыс, отбасы және қашықтықтан оқытуды үйлестіруге байланысты қиындықтарды атап өтті. Сонымен қатар, студенттер барлық уақытты басқару дағдылары бірдей қиын екенін атап өтті. Сонымен қатар, электронды білім беру құзыреттілігі мен оқу үлгерімі арасында айтарлықтай байланыс бар екендігі анықталды, демек, электронды оқыту дағдылары дамыған студенттер онлайн семестрде жоғары оқу үлгеріміне ие болады. Осыған байланысты қыз мен ерлер арасындағы қашықтықтан оқуға дайындықта айтарлықтай айырмашылықтар анықталды, ал қыздар олардың құзыреттілігі ерлерге қарағанда салыстырмалы түрде жоғары екенін көрсетті.

Зерттеу нәтижелеріне мен COVID-19 пандемиясының бұрын-соңды болмаған жағдайына сүйене отырып, қашықтықтан білім беру ортасына қанағаттануды арттыру үшін оқу жылының басталуына дейін студенттерді онлайн режимінде оқытуға дайындық сабақтарын өткізу ұсынылады.

Аннотация

За последний год образование сильно изменилось из-за пандемии COVID-19. Местные университеты были вынуждены перейти от традиционного режима проведения уроков к дистанционному обучению. За короткий период студенты были изолированы от общественной жизни и оказались перед экранами компьютеров, чтобы обучаться и посещать уроки через Интернет. В связи с этим цель данного исследования состоит в том, чтобы сначала определить наиболее необходимые навыки электронного обучения учащихся в период вынужденного дистанционного обучения, а затем, на основе выявленных компетенций, изучить фактическую готовность учащихся к дистанционному обучению. Выявление вышеупомянутых компетенций электронного обучения для их последующей корреляции с академической успеваемостью во время дистанционного обучения может стать отправной точкой в дальнейшем исследовании проблемы.

Если так, то я провел тематическое исследование смешанного метода с целостным подходом к исследованию этой проблемы. Я провел обсуждение в фокус-группах с 10 людьми причастными к университету, в лице студентов, преподавателей и членов администрации. Кроме того, я отправил анонимные интернет-опросы всем студентам и преподавательскому составу в одном частном университете в Казахстане, получил 1436 ответов от студентов и 43 от преподавателей. Вопросы, лежащие в основе данного исследования, следующие: (1) Каковы основные навыки электронного обучения, необходимые для успешной учебы во время вынужденного дистанционного обучения? (2) Насколько студенты одного частного вуза в Казахстане оценивают свою готовность к принудительному дистанционному обучению? (3) В какой степени преподавательский состав одного частного университета оценивает готовность студентов к принудительному дистанционному обучению? (4) Существует

ли взаимосвязь между компетенциями электронного обучения и академической успеваемостью студентов? (5) Есть ли разница в уровне подготовленности среди студентов разных полов, факультетов и лет обучения к экстренному дистанционному обучению?

Результаты показали, что студенты одного частного вуза в Казахстане хорошо подготовлены к вынужденному дистанционному обучению. И студенты, и учителя подчеркнули трудности, связанные с совмещением работы, общественной жизни, семьи и дистанционного обучения. Более того, студенты отметили, что все навыки, связанные с управлением временем, одинаково сложны. Наряду с этим было обнаружено, что существует значительная корреляция между компетенциями электронного обучения и академической успеваемостью, что означает, что студенты, обладающие хорошо развитыми навыками электронного обучения, как правило, имеют более высокие результаты среднего успеваемости в течение онлайн-семестра. В связи с этим были обнаружены существенные различия в готовности к дистанционному обучению между студентами мужского и женского пола, при этом женщины указали, что их компетенции сравнительно выше, чем у мужчин.

Основываясь на результатах исследования и беспрецедентной ситуации с пандемией COVID-19, предлагается проводить подготовительные сессии для онлайн обучения учащихся до начала учебного года, чтобы повысить удовлетворенность средой дистанционного обучения.

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Chapter 1: Introduction

Background of the study

In today's world, education is a substantial life component of the modern person. Getting educated leads to lessening life challenges and improving quality of life. Comparatively, more and more people are investing their time and finances to receive an education of a good quality. Likewise, in most countries, primary education is a compulsory minimum for everyone, which positively affects the functional literacy of future adults. Compulsory minimum refers to attending school and getting through primary educational programs. According to Roser and Ortiz-Ospina (2016), in their research for Oxford Martin School and University of Oxford, in 1940-1950, more than 50 percent of the world population was illiterate; nowadays, only 15-17 percent of the world population is unable to read and write. These statistics show that access and demand for education increased dramatically year by year. At the moment, to be more precise, during the COVID-19 pandemic, humanity realizes that the world is in the hands of highly educated people. And while the brightest minds of us are fighting against the invisible enemy, the field of education evolves and adapts to the existing realities. Briefly saying, kindergartens, schools, colleges, universities were forced to switch to distance mode with the enlarged implementation of e-learning tools. The abrupt transition to distance learning has made educational issues widely discussed and very extensive. Looking at the world today, we understand that online education is getting important and will remain relevant for a long time to come, as new perspectives are being opened up through adding digital components to the learning process.

Right now, it is difficult to imagine education without online platforms, video conferencing software, mobile applications, messengers, and other electronic tools. It is important to emphasize, that the demand in online education is not something new to our age. Undeniably, the COVID-19 pandemic acted as the main catalyst of the shift to a distant

mode of lesson delivery and increased use of online opportunities, but the gradual transition to online education picked up the speed long ago. It has been explained by several factors like the expansion of busy workers who are willing to receive a formal education but are not able to devote themselves to traditional full-time courses (Wang, 2010), the predisposition of modern society toward digital technologies (Margaryan, Littlejohn & Vojt, 2011), and globalization process in general. Along with that, it is worth saying that step-by-step digitalization has impacted on the progressive transition of educational materials and resources to e-format, which is another step toward online education. This is reflected in the work of Prensky (2001), who mentioned that modern society is divided into “digital natives” and “digital immigrants”, where the first group is born surrounded in a technology-enabled online learning environment, and the second group is forced to adapt toward existing conditions. Today’s digital natives are all “native speakers” of the computer language, digital-video games and the Internet. Obviously, they are surrounded by digital tools and tend to be technology-savvy in terms of education too. Returning to the situation with the compelled shift to online format, despite the fact that all of the above factors indicate that the process of online learning for modern society, predominantly for students, should be painless due to inherited predisposition to digital technologies, there is still concern about the actual preparedness for a sharp transition from traditional to distance learning.

As mentioned, the coronavirus (COVID-19) pandemic dictated its own rules, and all universities were forced to restructure themselves in order to adequately respond. The World Health Organization (WHO) has suggested adhering to social distancing practices and considering the practice of online lessons. As for the beginning of September 2020, UNESCO Institute for Statistics informed that more than 800 million learners were affected by the educational institutions closure, and shifted to online lessons in 41 countries (UNESCO, 2020). That was a reason for the demand in effective and quality online courses,

as well as well-trained staff and prepared students. While Levy (2003) stated that faculty and university infrastructure face numerous challenges when shifting from traditional to online environments, Arif (2001) questioned the level of student preparedness for online classes. Precisely, student preparedness for distance learning was rated according to the level of competency in computer technology, web search, skills in self-assessment and judgement, and readiness to abandon old studying techniques (Arif, 2001).

As literature suggests, the main actors involved in online teaching and learning are students, faculty, and parents. While each participant of the online education process faces a number of opportunities and challenges, the original motivation for this work is to delve deeper into the lens of students' perspective on distance learning. Being a practicing teacher during an emergency shift, I bore the burden of responsibility for the welfare and education of my students. Complaints from students about difficulties and pressures led to the idea of developing a study that would focus on identifying students' e-learning competencies required to perform effectively during online studies, measuring students' preparedness for compulsory distance learning based on these competencies, and reflecting on the relationship between e-learning competencies and academic performance during the distance learning period. To be precise, during the first quarantine in the Spring-2020 semester, I received many emails from students about academic failure and burnout. That raised my anxiety about the issue that students might not be ready for distance learning at the very beginning. So, the fundamental idea of this research is to provide a picture of students' preparedness level for emergency remote education and serve as a starting point in offering assistance for learners.

Indeed, educational institutions have made every effort to adapt and prepare for the forced transition to distant mode. Teaching staff and university infrastructure were pulled up to online mode of lesson delivery: digital literacy workshops were organized, electronic equipment was purchased, online learning environments were set up, responsible

departments and distance learning policies were reconsidered. However, in this turmoil the factor of student preparedness was underestimated. During the transition from traditional to online environments, educational institutions usually emphasize on what they have to be like neither what students need to do (Parkes, Stein & Reading, 2015). Creating the image rather than proposing actions might be considered as a temporary solution for the issue, but on a long run, more attention should be given to the subsequent actions than to the image that is formed. In this regard, this study attempts to examine the preparedness of students at one private university in Kazakhstan for emergency remote education based on the identified core e-learning competencies, and analyze the possible impact of e-learning competencies on academic performance, as this problem arose unprecedentedly during worldwide pandemic COVID-19.

Statement of the problem

In the middle of March 2020, the State Commission for ensuring the state of emergency under the President of the Republic of Kazakhstan announced the start of the state of emergency due to the widespread Coronavirus disease (COVID-19) (Press Service of the Prime Minister of the Republic of Kazakhstan, 2020). Local universities were forced to shift from a traditional on-campus mode of lesson delivery to distance education. In a short period, universities shifted to distance education and attempted to provide faculty with digital literacy workshops and required-for-teaching electronic equipment. While instructors all over the country rushed to update their curriculum in order to fit it to online education and began to teach remotely, students were isolated from social lives and were stuck in front of computer screens to take courses through the internet. It is important to emphasize that due to the rapid transition to distance learning, universities could not be fully prepared for the ushering of online education for learners, and there was a lack of understanding of student

preparedness for that. This could have happened because universities were loaded with transition issues and lost sight of the big picture.

Connectedly, there is a concern that due to the quick transition to online learning, students were not thoroughly prepared, which might negatively affect their academic performance. In this regard, there is a need to determine students' most required e-learning competencies for compelled distance learning at first, and then, based on identified necessary competencies, to study students' actual preparedness for that. The identification of the aforementioned e-learning competencies for their subsequent correlation with the academic performance during distance learning, might become a starting point in the further investigation of the problem. This paper attempts to measure students' preparedness for emergency remote education in one Kazakhstani private university and address the gap in the existing literature.

Purpose of the study

The purpose of this study is (a) to identify students' corresponding e-learning competencies for effective performance during online classes by adapting the framework of a process called Hybrid Behaviorally Anchored Rating Scale (Hybrid BARS) developed by Parkes, Reading and Stein (2013), and (b) to measure learners' preparedness level for emergency remote education in one Kazakhstani private university, and (c) to reflect on the correlation of e-learning competencies with academic performance during the distance learning period. In addition, another purpose of this study is (d) to determine the possible difference in the level of preparedness of students of different genders, years of study and faculties for the urgent distance learning.

Research questions

The research questions for this study are the following:

1. What are the students' primary e-learning competencies required for effective performance during compelled distance learning?
2. To what extent students from one private university in Kazakhstan rate their preparedness for compelled distance learning?
3. To what extent does teaching staff from one private university rate students' preparedness for compelled distance learning?
4. Is the relationship between e-learning competencies and students' academic performance significant?
5. Is there a difference in the preparedness level of students of different genders, faculties, and years of study for emergency remote education?

Hypothesis of the study

Along with mentioned research questions, this study is designed to look at the hypothesis that students with higher e-learning competencies perform better than students with lower e-learning competencies during distance education. So, the null-hypothesis is that there is no correlation between e-learning competencies and academic performance. And the alternative hypothesis is that there is a correlation between e-learning competencies and academic performance.

Significance of the study

The study about student preparedness for an emergency remote education can shed the light on existing problems during the transition to distance learning in the context of Kazakhstani higher education, and be used as a guide by other educational institutions in implementing and eliminating issues associated with online mode. Potentially, outcomes of this research may benefit educational institution's distance learning strategies and future plans, by delivering the data which might support the efficiency of remote classes by providing the status of student preparedness for distance learning. Furthermore, this study is

significant, as the findings of this study can fill the gap in existing literature due to a lack of scientific works in the field in the context of Kazakhstan. Consequently, the identified data can be applied by relevant authorities to develop the local distance education. Also, the significance of this study is that it might become a tool for university administration and teaching staff for meeting the distance education standards and how students need to be prepared for them, as well as what to stress attention on. Along with that, if the impact of e-learning competencies on the academic performance of students will be confirmed, then it will be possible to consider the issue of honing these competencies directly during the classes. Accurately, this study may point out students' skills and competencies related to distance learning that are in need of improvement. Thus, the results might also help in consolidating training for learners prior to the beginning of the academic year. Finally, university may take into consideration this work while preparing students for future online experiences and advancing satisfaction with a distance learning environment.

More specifically, the weight of this study is in analyzing the current state of student preparedness for distance education, as well as to set up the ground for further studies in the field. So, it is not only about defining the problem, but also about setting up the ground for a new phase in Kazakhstani distance education.

Definitions of key terms

Distance learning

Widespread usage of technologies in the field of education has led to the situation when student attendance patterns, understanding of classroom environment, lectures and seminars have changed. While some learners complete their studies without setting foot on campus, the majority are combining online classes with face-to-face sessions. And yet, all the variants are somehow called Distance Learning. In this regard, Wales (2013) stated that “online, distant, blended, external learning concepts are blurred”, as all the models are

integrating technologies to some extent. For this study, “distance learning” concept, which is also referred to online education or e-learning, is formulated as a mode of lesson delivery when students and an instructor are working from different locations, interacting among each other with the help of various digital platforms synchronously and asynchronously, and exchanging educational resources in the university-provided Learning Management System (LMS).

Emergency remote education

The emergency remote education is a temporary shift of lesson delivery format from one to an alternate-online model due to crisis circumstances, which is contrasting to intentionally prepared online courses. In our realia, the crisis circumstance is COVID-19 lockdown. Emergency remote education involves the integration of fully remote teaching and learning instead of face-to-face or blended courses, that otherwise would be delivered traditionally and will return to that format once the crisis or emergency will abate (Hodges, Moore, Lockee & et al., 2020). The primary objective in the conditions of emergency remote education is to provide temporary access to instructions and instructional supports in a manner that is capable of quickly replacing the existing educational process.

COVID-19

On December 31, 2019 pneumonia cases with unknown etiology were reported by Wuhan City Health Committee (2019). Later, it was named COVID-19 disease and designated as a new coronavirus. By the end of January 2020, there were 295 laboratory-confirmed cases (European Centre for Disease Prevention and Control, 2020). Since that time, the number of infected people has grown substantially all around the world, including about 13 million confirmed cases by mid-July, 2020 (World Health Organization situational report - 175, 2020). COVID-19 disease was declared a pandemic, which led to quarantine orders and compelled shift to online education.

E-learning competencies

E-learning competencies is referred to the set of skills that are required to have a successful online learning experience. While e-learning makes reference to online learning or electronic learning, e-learning competencies are competencies required to complete a course or a program remotely with success (Horton, 2016). Commonly, e-learning competencies are associated with the ability to use web-browser, mastery of online platforms, fast typing and self-management skills.

Conclusion

The Introduction Chapter has described the focus of the thesis, which is to identify students' e-learning competencies for effective performance during compelled distance learning; to measure their preparedness for online mode of lesson delivery based on identified e-learning competencies; and to reflect on the relationship of e-learning competencies and academic performance during the distance learning period. This chapter highlighted the background information and rationale for the researched issue, as well as described the purpose of the study and five research questions that defined the study direction. Along with that the significance of the study and definitions of key terms are provided in the introduction chapter.

Overall, this study is proposed in six chapters. The second chapter is fully devoted to the literature review related to distance learning issues and e-learning competencies. Structurally, it is organized in themes like online/distance learning, background of Kazakhstani online education, COVID-19 and worldwide education, shift to compelled emergency remote education, instruments to measure preparedness for online education, e-learning competencies, theories about online learning, and etc. The third chapter explains methodology, data collection and analysis procedures. The fourth chapter presents data analysis and findings in relation to research questions separately. The following chapter

presents discussion of findings pertaining to the literature review. Finally, the summary of the whole work consists of brief review of the study, recommendations and implications for future studies.

Chapter 2: Literature Review

The world is changing faster now than it did years ago. The principle is deeply explained within the exponential technological change law, which says that the future is faster than we think it is. According to Prensky (2007), during the time of constant active educational modernization, high-speed access to new technological achievements leads to radical changes in how education looks like. For the last decade, e-learning systems are being integrated into educational environments gradually, and students, as well as teachers, are being influenced by these modifications painlessly. However, during the COVID-19 pandemic, the natural transition to the implementation of e-learning was replaced by a compelled drastic shift to distance learning, which might cause negative consequences including poor academic performance and burnouts. Connectedly, the purpose of this study is to identify students' corresponding distance learning competencies for effective performance during online classes, to measure learners' preparedness level for emergency remote education, and to identify potential correlation of e-learning competencies with students' academic performance. Research questions that drive this study are:

1. What are the students' primary e-learning competencies required for effective performance during compelled distance learning?
2. To what extent students from one private university in Kazakhstan rate their preparedness for compelled distance learning?
3. To what extent does teaching staff from one private university rate students' preparedness for compelled distance learning?
4. Is the relationship between e-learning competencies and students' academic performance significant?
5. Is there a difference in the preparedness level of students of different genders, faculties, and years of study for emergency remote education?

In the literature review chapter, along with the theoretical and conceptual framework of this study, the main differences between online, distance, and emergency remote education are described. Along with that, main theories related to distance learning, e-learning competencies, as well as attitudes toward distance learning are reviewed. Thereafter, the formation of online education in Kazakhstan is portrayed with distinct reference to the Ministry of Education and Science of Kazakhstan. Prior to the end of the literature review, the COVID-19 pandemic situation is thrown light on with a specific look to the field of education all around the world and Kazakhstan particularly. Lastly, existing instruments to measure student preparedness level for online education along with attitude toward remote studies are reported.

Structurally, while several chapters of the literature review are closely related to the theoretical and conceptual framework, defining various concepts of distance/online education, and the effect of COVID-19 on the field of education; subsequent chapters are more about theories connected to online education and competencies to compare and contrast student preparedness for remote learning.

Theoretical and conceptual framework

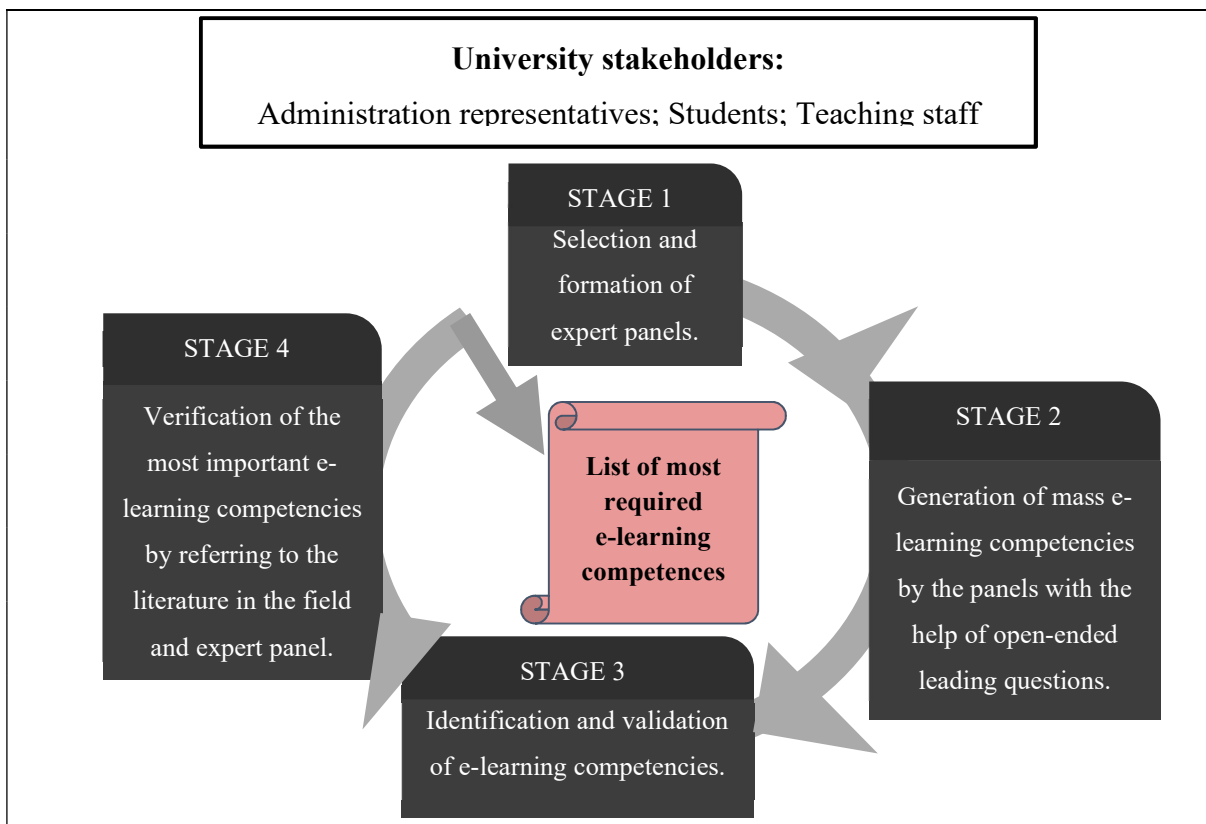
Since this study considers the possibility of investigating several issues within the five research questions sequentially one after the other, it was decided to use conceptual and theoretical frameworks that would together unify all the problems studied. Looking ahead, in this chapter, I would like to describe two frameworks, which are the theoretical framework of social constructivism and the conceptual framework of cause and effect.

To describe the first framework that was applied in this study, the first research question needs to be referred to. More precisely, the first research question is about identifying e-learning competencies required for effective performance during compelled distance learning. To construct a well-defined answer to this research question, it is decided

to use the theoretical framework of social constructivism, where the university stakeholders, namely teaching staff members, students, and university administration are exposed to work together on developing a list of e-learning competencies and classify them according to their relative importance based on their own distance learning experiences. While university stakeholders are expected to produce a list of most required e-learning competencies within the social constructivism framework, the stages of developing the list of competencies were adapted from the work of Parkes, Reading, and Stein (2013), and called the Hybrid Behaviorally Anchored Rating Scale (Hybrid BARS); and implemented during data collection. It is believed that the Hybrid BARS process in the framework of social constructivism will represent ideal conditions for responding to the mentioned research question.

Figure 1

Hybrid BARS process in Social Constructivism Framework



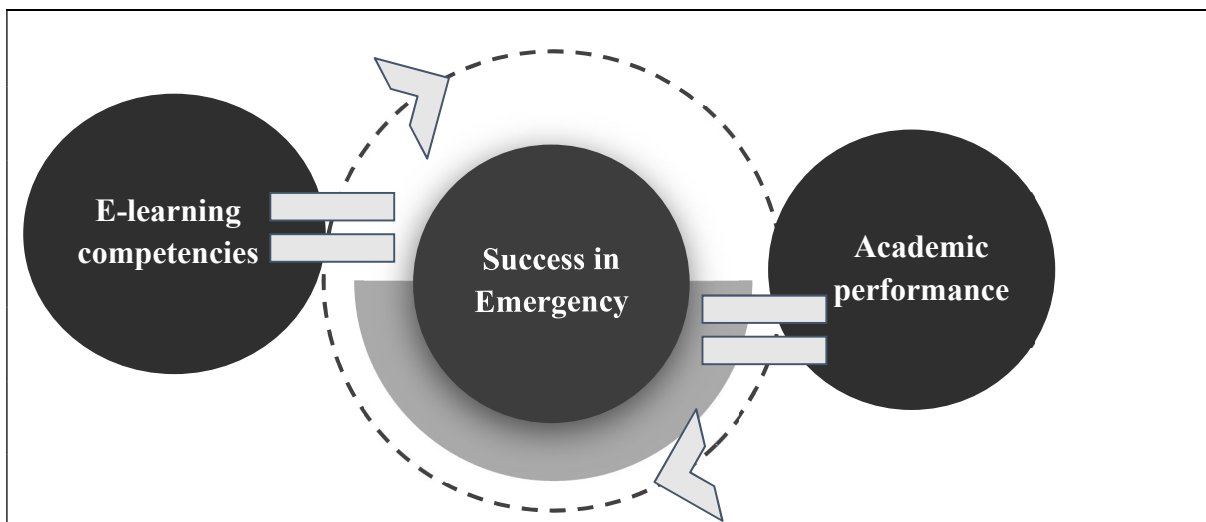
Note. Hybrid BARS - adapted from the work of Parkes, Reading, and Stein (2013); Social Constructivism Framework - interpreted from Vygotsky.

The next four research questions imply using an identified list of the most required e-learning competencies and measure students' preparedness level for compelled distance education as well as finding relationship between e-learning competencies and academic performance. As there is an assumption that students who demonstrate high scores in e-learning competencies, also tend to be successful during remote studies, which results in having high GPA score, it is decided to use a cause-and-effect conceptual framework, as it helps to demonstrate how multiple factors occur simultaneously for an outcome to happen (Population Survey Analysis, 2014). Connectedly, the hypothesis for this study is developed as:

- *the null-Hypothesis (H_0) is - there is no correlation between e-learning competencies and academic performance;*
- *the alternative Hypothesis (H_a) is - that there is a correlation between e-learning competencies and academic performance.*

Figure 2

Conceptual Framework of cause and effect



Note. Hypothetical relationship between e-learning competencies and academic performance.

According to Bello et.al (2018), understanding causal mechanisms among variables is important for the positive management of the study process. In the frames of this research, it is crucial to understand how well do students rate their preparedness level for online

learning, and at the same time to check whether there might be any correlation between e-learning competencies rate and GPA results.

We believe that, having high e-learning competencies is crucial for online education. But there are some additional requirements needed in order to have success in remote studies. Regarding that, having access to the resources, comfortable conditions for studying, laptop or tablet, good internet connection are some reasons that also may affect the success during the learning process (Gierdowski & Galanek, 2020; Dev, 2021; Tiwary, 2020; Prescott, 2020).

Distance Education and Compelled Distance Education

Traditionally, classes are divided into on-campus, online, or blended. However, COVID-19 mixed all the cards. Compelled transition to distance education led to the emergence of hybrid disciplines that were planned as traditional on-campus courses but were forced to be conducted online. In this regard, it is worth mentioning the basic concepts from the literature in the field. This section presents a brief comparison between distance education, online learning, and compelled distance learning.

While distance and online education are comparatively new phenomena, Bower and Hardy (2004) informed that prototypes for these terms were first mentioned in the 1850s. In the 20th century, education was enriched by satellite technologies and fiber-optic systems, which can be counted as ancestors for modern online educational tools (Bower & Hardy, 2004). Nowadays, it is popular to get a degree without setting foot on campus, and even traditional programs include online-led sessions in their curriculum. Revealing this, Wales (2013) concluded that the “online, distant, blended, external learning concepts are blurred” because all include technologies to some extent. Despite the distance and online education interchangeably appear in different studies (Roman, Kelsey & Lin, 2010; Johnson & Berge, 2012), the primary difference is that distance education is about instructor and students who

are working from different locations throughout the whole program, and the online education is an e-tool that enables internet software to be present in campus-based classroom interaction (Stauffer, 2020). Based on this, it can be said that the goal of organizing distance education is a delivery of solely on-distance courses; and online education is a supplementary digital strategy for the teacher-student interaction within traditional or blended courses. On the contrary, Allen and Seaman (2014) defined online education in a different way combining it with distance learning, which contradicts Stauffer's logical explanation. They said that online courses are any courses having 80-100% of online delivered content, blended courses have a percentage of 30-80%, and traditional courses include less than 30% of online instruction delivery. This is very similar to Kentnor's interpretation of online/distance learning. According to Kentnor (2015), distance or online learning is a method of lesson delivery when students and a teacher are physically located in different places. To sum up, it can be said that the concepts of distance and online learning are interchangeable to some extent, but there is still a difference between them. As for this study, the conditions are predetermined by the COVID-19 worldwide pandemic, and this is not particularly important to hold these concepts separate. Moreover, the unprecedented age gave a rise to the term called Emergency Remote Education.

According to Hodges, Moore, Lockee, Trust, and Bond (2020), the term emergency remote teaching was paid attention to prior to the spread of Coronavirus disease. Briefly saying, emergency remote education can be a temporary solution to an occurred problem (Golden, 2020). Undeniably, it is not the same as online education because a compelled shift to remote learning is not an option, but an obligation. While debating over the advantages and disadvantages of distance learning and emergency remote learning is meaningless, it is clear that emergency remote education can be considered as a subcategory of online classes. It involves the integration of fully remote teaching and learning instead of face-to-face or

blended courses, that otherwise would be delivered traditionally and will return to that format once the crisis or emergency will abate (Hodges, Moore, Lockee & et al., 2020).

Theories related to distance learning

The proliferation of distance learning and online education has influenced the development of several learning theories in this area. Most of them are based on basic learning theories such as behaviorism, cognitivism, and social constructivism (Picciano, 2017). When we talk about learning theories related to online education, it should be noted that the foundation began with the theories mentioned above. In this chapter, several theories will be discussed in terms of the relatedness to the online learning environment.

Community of Inquiry (CoL)

One of the most popular models for the online learning environment was developed by Garrison, Anderson, and Archer (1999), and called Community of Inquiry (CoL). The idea is based on the concept of three distinct “presences”: cognitive, social, and learning. This model supports the design of online courses as active learning communities, where proactive teachers and learners are experiencing ideas, information, opinion sharing in three dimensions. CoL emphasizes social presence, teaching presence, and cognitive presence as essential elements to facilitate successful learning in a distance learning environment.

Table 1

Community of Inquiry

Concept	Definition
<i>Social Presence</i>	The ability of participants to identify with the community, communicate purposefully in a trusting environment, and develop interpersonal relationships by way of projecting their individual personalities.
<i>Cognitive Presence</i>	The extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical Community of Inquiry.

Teaching Presence The design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes.

Note. Community of Inquiry by Garrison, Anderson and Archer (1999).

According to Garrison (2007), CoL originated from the constructivist approaches to education, where through respectful collaboration students take on the responsibility of actively constructing and validating knowledge.

Siemens' Connectivism theory

Connectivism theory is a learning model that recognizes the difference of knowledge diffusion, growth, and change due to vast data networks in the past and present. Siemens (2004), stated that the internet changed the way people learn from internal, individual lessons to group, collective, and even mass training. Within the framework of connectivism, learning is not centered on a person, but exists as an independent process, a flow of information. Precisely, knowledge is focused on connecting information sets that allow people to learn more and more (Siemens, 2004). In connectivism, learners must understand and experience the navigation and recognition of ever-changing and evolving information on the web.

Harasim's Online Collaborative Learning theory

The theory of Online Collaborative Learning (OCL) was developed by Harasim (2012), and focuses on the power of the Internet to establish a learning environment that promotes collaboration and knowledge. OCL is described as a new learning theory that focuses on collaborative learning, the accumulation of knowledge, and the use of the Internet as a means of reshaping formal education (Harasim, 2012). Similar to Community of Enquiry theory, Online Collaborative Learning is derived from social constructivism learning theory as students are encouraged to jointly solve problems through discourse, and the teacher plays the role of a facilitator, as well as a member of the learning community (Picciano, 2017).

Attitude toward distance learning

From the moment of a pandemic lockdown, distance learning and other things that are associated with COVID-19 appeared in our lives. Life, our daily routine as well as education have also changed a lot. Forced transition to distance learning created both excitement and worries for all stakeholders of the educational process. However, as mentioned earlier, online learning appeared long before COVID-19, and attitudes towards this type of learning activity have always been diverse. Here, we will focus on exactly how distance learning has made its changes in the lives of students, teachers, and parents; and on the general perception of this type of learning.

For parents and the older generation, distance learning, in the context of COVID-19, is something dubious, not completely reliable; for students, it is sitting out of their youth at the computer and becoming a prisoner of four walls. But distance learning is good in the lives of working people who are also family people, for whom this type of learning is a relief and a solution (Mathew & Ebelelloanya, 2016).

As it was already mentioned, in today's realities, every single student all around the world has experienced remote studies. However, even aside from COVID-19 and its effects, many modern students have experienced online learning to some extent. Furthermore, remote studies are gaining popularity due to fundamental differences from traditional classes, such as the accessibility to learning materials regardless of time and space, flexible timing, and scheduling opportunities (Bourdeaux & Schoenack, 2016). These factors are crucial for those learners who are attempting to combine work and study, which may lead to stress due to the lack of time and having many roles and commitments (Morris, Brooks & May, 2003). On the contrary, it is no secret that during online learning, students are given more homework, project works, and assignments (Sanchez, 2020). Teachers began to assign group work more often, which in turn made it possible for students to get to know each other

better. If during traditional learning, students completed assignments individually, went to classes according to an individually selected schedule, which often led to the fact that students often did not know each other well, during distance learning, students are given a large number of joint project work for a certain amount of time. During this time, students create group chats, they discuss the plan/strategy for completing the task on a daily basis. After presenting their work, they share their insights and impressions. This kind of close-knit work creates certain memories, even friendships that continue in the future (Bowman, 2015). In this regard, the attitude toward the online mode of learning varies from individual to individual.

Traditional teaching forced people to see each other on certain days, at certain times. On the contrary, people in quarantine use all possible methods of communication, such as video/audio calls, conferences, and texting through instant messengers, and etc. Furthermore, the pandemic showed humanity how important it is to communicate with people, with the outside world. Students, in turn, forced to stay at home in their best years, are the main users of current methods of social communication, make new acquaintances, friends and try to communicate with their peers as much as possible.

Formation and background of online education in Kazakhstan

A brief overview of the establishment of online education among Kazakhstani universities is presented in this section. According to Dalayeva (2013), in 2009 over 28 universities offered distance learning technology, then by September 2012 the distance learning was being offered on websites of about 50 higher schools in Kazakhstan. Currently, 132 universities of different types offer various programs at undergraduate, graduate, and postgraduate levels.

With the numerous changes in national regulatory documents, since 2018 the Ministry of Education in Kazakhstan has provided academic freedom to higher educational

institutions and allowed them to design their own academic policies (Kazakhstan Today, 2018). This led to the conditions when universities without hesitation started to experiment with partly and fully online courses and programs. According to (Ivashenko, 2020), 71 universities have registered online programs in 2020 before the COVID-19 pandemic. It is worth noting that online education had been practiced in Kazakhstan long before, but was not extensively introduced among a great number of universities. Despite academic freedom in designing curriculum and setting up the method of lesson delivery, there are still some regulatory documents that frame educational standards. Furthermore, an abrupt transition to emergency remote education gave birth to a couple more orders. Nowadays, the government partly dictates the online education policies and standards by:

1. The Law of the Republic of Kazakhstan dated July 27, 2007, No. 319-III "On Education";
2. Order of the Minister of Education and Science of the Republic of Kazakhstan "On approval of the Rules for organizing the educational process on distance educational technologies" dated March 20, 2015, No. 137;
3. Order of the Minister of Education and Science of the Republic of Kazakhstan "On additional measures to ensure the quality of education during the transition of the educational process to distance learning technologies for the period of the COVID-19 coronavirus infection pandemic" dated April 08, 2020, No. 135;
4. Methodological recommendations on the organization of intermediate and final certification in institutions of higher and (or) postgraduate education during the COVID-19 coronavirus infection pandemic, approved by order of the Minister of Education and Science of the Republic of Kazakhstan dated May 04, 2020, No. 179.

Delving into the literature, distance learning in Kazakhstan was recognized as a type of education in 1999, through the normative documents of the Ministry of Education and Science of Kazakhstan "On Education". According to Alshanov (2009), the first "distance learning instructions" project was presented in 1999, with the co-initiation of the Ministries of Education of Russia and Kazakhstan. This project involved two universities from both

countries: Tomsk State University and Kazakh State Pedagogical Institute. The fundamental aim of this collaboration was an elaboration and introduction of different forms of teaching and the preparation of experts with higher education degrees (Sapargaliyev, 2012). Remaining on this wave, Kazakhstan started to negotiate the project called "E-Learning Systems" within the Ministry of Science and Education in 2011. Key lines of this policy were accompanied in 8 stages (Dalayeva, 2013).

While the formation of online education in Kazakhstan is still in the baby steps, it is becoming a popular form of learning. The Kazakhstani educational community actively implements and explores different methods of using the online learning prospects (Sapargaliyev, 2020), as it is clear that online education is the chance to expand knowledge and use various information resources.

World practices in the introduction of distance learning during COVID-19

Taking into consideration that the COVID-19 pandemic was not in the plans of any human being, we should admit that it made its changes, that we face every day as a new challenge. It is not the first virus that the world is facing, but it has the highest speed and power to go around the globe (Firdoussi, 2020). It affected every part of the system we are living in, starting with healthcare and finishing with the economy. It is important to emphasize that education is a field that is having a huge amount of immediate, urgent, and total changes.

Relying on the raw data, about 25 percent of the world population goes to school and 6.7 percent goes to the university (UNICEF, 2020). It makes up that one third of all people on Earth faced some challenges and changes related to the way they were getting the education. During the lockdown, more than 100 countries have applied nationwide closure, influencing approximately 90 percent of the world's student population and threatening their education comfort (Firdoussi, 2020). Since people all around the globe could not directly

adjust the educational system to the conditions of a pandemic, a variety of methods of obtaining an education were sampled in different countries. In other words, different countries had different epidemiological situations. Accordingly, the type of learning was adjusted due to the epidemiological state of the country.

Most of the countries required or recommended schools to close at the beginning of March 2020. Almost all schools were transferred to remote education. But, after some time, some countries decided to use a phased approach (King & Schmidt, 2020). The phased approach provides the re-opening of certain educational institutions. For example, some countries decided to open kindergartens for a time, students were recommended to be on campus on final exam days.

Some countries have not imposed lockdowns at all. They are Sweden, South Korea, Turkmenistan, and Tajikistan. Despite the fact that South Korea “was one of the worst-hit nations during the early stages of disease outbreak, it has remained to be one of the few that has managed to keep the situation under control without a lockdown” (The Indian Express, 2020). Italy also had a very dangerous and severe epidemiological condition, which led the Italian education system to be closed at all levels of educational institutions till the next autumn term (King & Schmidt, 2020). Israel made early steps and knuckled down for the pandemic at the very beginning. Israel closed all schools from the start of the COVID-19 pandemic, and “by June, it was being lauded internationally for containing the spread of COVID-19” (Spires, 2020). But this was only for June. After reopening schools and other crowded, public places there was a dramatic increase in COVID-19 cases, which led to the closures again. Sweden didn’t close schools at all and Donald Trump was the one who supported Sweden’s decision (Spires, 2020). To mention, the epidemiological situation in Sweden was the same as in neighboring Finland which decided to close all educational institutions (Spires, 2020). An important moment to emphasize is that Finland is a country

that coped well with the global virus. Japanese schools had different strategies and were more precautionary than other countries. They “attend class in person on alternating days, so that classrooms are only half full. Lunches are silent and socially distanced, and students undergo daily temperature checks” (Spires, 2020). This kind of precaution rules led to keeping the quality of education not harming the health.

Despite all these facts of how education systems of different countries struggled and challenges that were mostly faced at the beginning, we can say that as time passes, we are becoming more experienced and surely, challenges faced today, will bring their fruits tomorrow.

COVID-19 pandemic situation in Kazakhstani educational context

Immediately after the World Health Organization proclaimed that COVID-19 is a pandemic, European-influenced areas declared that pupils at schools and colleges should be sent home and face-to-face classes will be changed to web-based, figuring out how to limit the nearby communications among students and teachers (Wired, 2020). Parallely, on March 13, 2020, the first two cases of COVID-19 were detected in Kazakhstan, and the very next day, school students were sent home and had to stay at home in quarantine from March 16 to April 5, also starting from March 16 all lessons in colleges and Universities switched to online (Tengrinews, 2020). Subsequently, it turned out that the quarantine was extended for a longer period.

Across Kazakhstan, 131 universities, 801 colleges, and 7398 schools switched to distance/online learning mode during the second half of March 2020 (Information and Analytical Center, 2020). Traditionally in Kazakhstan, a long spring break occurs in the school year during that period. This period was used by the education institutions to prepare themselves for a switch to distance learning, with the full transition beginning in early April (Baza Yurist (Lawyer database), 2020).

An urgent transition to distance learning had a serious impact on all participants of the educational process. Theoretically, more than 6 million citizens of Kazakhstan were expected to immediately become active participants of online studies, including students, teachers, and educational authorities (Information and Analytical Center, 2020). There was little time to solve the immediate challenges with this transition. In many parts of the country, a lack of access to high-speed Internet at home made the prospect of streaming lessons difficult to realize. In addition to this issue, many learners lacked access to electronic devices such as computers, webcams, or even mobile phones. Furthermore, there were indicated that many schools – particularly in the rural areas – did not have the effective infrastructure to develop and disseminate online lessons (Information and Analytical Center, 2020). Many teachers and school officials also did not have sufficient technological literacy to produce effective content, or they otherwise had problems with adapting to online teaching.

All mentioned above displays the challenges of emergency remote education in Kazakhstan. Both students and teachers had to create unique learning environments, which implies all the peculiarities of local challenges.

Preparedness for distance learning measurement tools

While online learning is a required condition during the COVID-19 pandemic, the proliferation of online education increased its popularity, especially in higher education institutions, a long ago. Logically, students who are willing to work and study or are situated far away from educational institutions benefit from distance learning. Several scholars were interested in measuring how well students, teachers, and the infrastructure are prepared for remote learning, and developed tools to evaluate those factors. In this chapter, some existing tools to measure preparedness for distance learning will be reviewed.

The literature in the field depicts that many studies rely on the same tools while developing ideas to measure readiness for online. For instance, many researchers (e.g.,

Atkinson & Blankenship, 2009; Blankenship & Atkinson, 2010; Smith, 2005; Smith, Murphy, & Mahoney, 2003) applied the *Readiness for Online Learning* questionnaire developed by McVay (2000), that attempts to use attitude and behavior of students as a predictor of preparedness for online learning. Interestingly, the application of the same measurement tool to different contexts led to completely different conclusions, varying from suggestion to teaching students time management and self-directed skills, and ending up with outlining that students are extremely comfortable with remote lessons.

While McVay's questionnaire remains a popular tool for measuring student preparedness for e-learning mode, different instruments were developed too. Watkins, Leigh, and Triner (2004) created an *E-learning readiness scale in six dimensions*, where students were asked to rate themselves in terms of access to technology, online-based skills, and communication, motivation, online audio/video, web discussions, and importance to success.

Similarly, there was another multidimensional instrument for measuring students' online learning preparedness level, developed by Hung, Chou, Chen, and Own (2010). The main difference of this survey was that it has only a learner skills-oriented question set, which means that there were not any questions regarding the quality of internet or electronic devices.

Another approach was used in the study of Dray, Lowenthal, Miskiewicz, Ruiz-Primo, and Marczyński (2011), who decided to construct a survey that aimed to measure both learner competencies and technological capabilities. While the "learner competencies" subscale was aimed to define characteristics of a successful learner in an online learning environment, "technological capabilities" expanded the access to and frequency of confronting technology use questions. Logically, the factor analysis technique was applied in most of the mentioned studies.

Conclusion

Throughout the section of the literature review, I have reviewed the fundamental difference between online, distance, and emergency remote education. Main theories related to distance learning were compared to each other, stating that most of them originated from behaviorism, cognitivism, and social constructivism. Along with describing attitudes to remote studies, local and worldwide practices of introducing online classes were reviewed. Based on the literature review, several instruments to measure preparedness for distance learning were found and analyzed.

Next, the Methodology chapter will present the research design, data collection method, and instruments; provide information on the research site, sampling strategy, ethical issues, and limitations of the study.

Chapter 3: Methodology

This study aims to identify the most important e-learning competencies of students and measure student preparedness for emergency remote education. Broadly, the work can be divided into two halves. In the first half, which includes the Social Constructivist Framework and an adaptation of a redesigned process called Hybrid BARS, the panel of university stakeholders is asked to work on a list of e-learning competencies; and identify relatively most important ones based on their own experience in remote education. In the second half, relying on the identified core e-learning competencies, students' preparedness level for compelled online education and correlation of e-learning competencies to academic performance will be measured in the Cause and Effect conceptual framework.

Undeniably, the COVID-19 pandemic has had a huge impact on education and the way people live in general. Social isolation and lockdown took away jobs from many people all around the world. At the same time, students also have experienced difficulties due to the issues with adaptation to new realities of distance learning, as not everyone had the necessary competencies and skills. In this regard, there is a need to determine students' must-have e-learning competencies at first, and then, based on found necessary competencies, estimate students' preparedness for compelled online education. Finding out the e-competencies for their subsequent correlation to the level of preparedness for distance learning might become a starting point in studying this global problem. It is worth mentioning that while previous studies in the field emphasized problems that occurred during remote education (Bigatel, Ragan, Kennan, May & Redmond, 2012), this work is more about determining competencies that are needed for successful emergency remote education.

The Methodology chapter presents the following topics: the research design, data collection methods and instruments, sampling procedures, ethical issues, limitations of the study, research site as well as data collection and analysis procedures.

Research design

This study will employ a mixed-method research design because it helps to strategically combine both quantitative and qualitative research methods' characteristics to form multi-sided research. According to Johnson and Christensen (2019), the overall idea of mixed methods is that the whole is greater than the sum of its parts. On the one hand, mixed methods cover qualitative collection of the voices from university stakeholders, who are being actively involved in distance learning, with the aim to identify core e-competencies for emergency distance education. On the other hand, mixed methods allow for collecting quantitative data from a large number of participants, students and instructors, who rated learners' preparedness for distance education based on previously identified e-learning competencies. This benefits the research because the results, based on quantitative and qualitative approaches, would consist of a descriptive interpretation of students' e-learning competencies, students' preparedness level for the compelled remote education, and the relationship of e-learning competencies and students' academic performance. In particular, researchers applying this method will benefit from addressing complex and multifaceted issues (Creswell, 2013). Exploring the university's urgent transition to an online format is the purpose of this work, and the versatility of this process is another justification for the choice of mixed methods. According to Merriam (1998), who emphasizes the importance of profound research, a thick and enriched perspective toward the study will form a complete picture of the situation. Connectedly, we believe that the mixed methods approach will bring thickness and richness to the investigation.

Moving further, a single case study with the holistic approach was selected as a particular research design. While the case study is "a contemporary bounded system (a case) which is studied through in-depth data collection involving multiple sources of information which reports case description" (Creswell, 2013, p. 97), it is also focused on a

comprehensive view on the particular context or settings. In the framework of the case study, e-learning competencies and students' compliance with them during a compelled shift to online education was considered on the basis of one Kazakhstani private university. This likely means that the stakeholders of this private university have identified e-learning competencies that would be consistent with the successful online learning of only this university's students. In other words, the competencies selected by the stakeholders of this private university were addressed directly to the students of this university and may not be valid for other educational institutions.

Data collection methods and instruments

In this section, data collection methods and instruments are described. Since the first stage of collecting data in the mixed method study is qualitative, and about asking university stakeholders to participate in the online group discussion process, focus group, personal experiences in online learning are the central phenomenon that require exploration and understanding (Creswell, 2014). Here, students, teaching staff members and administration personnel are about to participate in the group discussion about the most important students' e-learning competencies with the primary aim of collectively developing a list of them. With the help of the Hybrid BARS process, which is the framework for the focus group discussion, the competencies are about to be described in "multidimensional, behavior specific terms" (Anshel & Webb, 1991, p. 32), as they would be validated from stakeholders' side and reflected in the literature in the field. While the Hybrid BARS process originally consisted of five stages and was first introduced by Smith and Kendall (1963) predominantly for sport; for this research, the Hybrid BARS process was revised from the work of Parkes, Stein and Reading (2015), and only four stages were considered to apply.

Table 2

Revised stages of Hybrid BARS

Stage 1	Selection and formation of the expert panel (focus groups); <i>The selection of members for the expert panel is based on having experience in online learning and personal will to take part in the research.</i>
Stage 2	Collectively generation of mass e-learning competencies and dimensions that can group similar competencies, with the help of open-ended leading questions and a sample list of e-learning competencies; <i>Several leading questions about most important competencies (skills) needed for online studies and whether they can be grouped together; Classification of important/unimportant competencies.</i>
Stage 3	Identification, validation, and consolidation of e-learning competencies; <i>After stakeholders developed their own lists of most required e-learning competencies, similar (synonyms, interchangeable) words are to be grouped together and coded.</i>
Stage 4	Verification of the most important e-learning competencies by referring to the literature in the field and back to the expert panel. <i>Validation of developed list of e-learning competencies from the literature in the field; and presenting them back to the stakeholders to ensure that all the competencies offered by them have been correctly interpreted</i>

Note. The process of conducting group discussion with the revised stages of Hybrid BARS.

The main open-ended leading questions for the group discussion are:

Q1: Can you define different dimensions (categories) of competencies (skills) required for effective performance during compelled distance learning?

Q2: Which competencies (skills) are included in each dimension?

Q3: List at least three competencies (skills) from each dimension?

Q4: Can you classify all the competencies from each dimension according to the essential (must have), important (should have), or unimportant?

As the result of the qualitative part of the data collection, the list of the most frequently mentioned, and considered as the most important, e-learning competencies is to be created. Later, in the next stage, these competencies will be applied to measure student preparedness for distance learning.

The second stage of the data collection is a quantitative survey designed for students and teaching staff separately, with the same questions in it. During this stage, participants

will be asked to take part in the web-based online survey, where they will be asked to rate students' preparedness for distance learning in relation to formulated e-learning competencies, using a five-point Likert scale items, where 1 is low and 5 is high. While students will be asked to rate themselves and indicate their GPA for the last semester, teachers will rate all students' preparedness level in the aggregate, indicating which faculty they teach predominantly at. It is believed that demographic variables in the survey, such as year of study, specialty, and gender, will serve as a narrowing tool for manipulating the data.

Sampling procedures

In this part, the sampling procedure is described. For this research, all participants are selected from one Kazakhstani private university. The data collection procedure involves three different groups of participants that will be recruited independently, with different sampling methods.

While potential participants for the qualitative part of the study were initially filtered and thereafter recruited via email, the quantitative part of the study included all students and teaching staff members of one private university willing to participate in a web-based survey. It is worth mentioning that for the qualitative part of the study, a minimum of ten participants were to be invited, and for the quantitative part, all 300 teaching staff members and about 6000 students were requested to participate.

For the qualitative part, precisely for focus group discussions with leading questions, 10 participants were considered among university administration, teaching staff and students. They were selected upon the purposive snowball sampling method based on having previous experience with distance learning. According to Creswell (2014), a purposeful sampling strategy suits the conditions when participants are able to share their perspectives on a specific topic in a more detailed way. As the main objective was to formulate the list of students' most important e-learning competencies, belonging to distance mode of lesson

delivery and proactivity were considered as an important factor during the sampling process. The final list of participants consisted of 3 university administration members who were active in establishing distance learning policies, 4 students who have been experiencing remote studies for 2 semesters, and 3 teachers conducting classes online.

For the quantitative part of the study, participants were composed of students from different faculties and cohorts; and teaching staff all around the one private university. They were asked to rate students' preparedness for online learning based on the competencies identified previously during the qualitative part of the data collection. The random sampling technique was applied to cover students and teachers from different stratum (faculties, cohorts). While it was predicted to engage about 10% to 15% of all students and teachers, 1436 students and 43 teachers responded to the quantitative surveys.

All the participants were recruited voluntarily, and the informed consent was used to confirm their willingness to participate.

Research site

One Kazakhstani private university with more than six thousand students was chosen as the research site. All the data collection process was held online due to the COVID-19 pandemic.

Data collection procedures

Once I received an approval from my thesis supervisor and the Nazarbayev University Institutional Research Ethics Committee (IREC), I prepared to launch my data collection process in January 2021. The data collection was organized in three stages: (1) online group discussions for the qualitative part of the research, (2) an anonymous web-based survey for students, and (3) an anonymous web-based survey for teaching staff.

Qualitative focus group discussion

For the qualitative part of the research, I used a purposive sampling method and invited a total of 10 participants via Nazarbayev University corporate Gmail account, explaining the purpose of the study in general, and particularly the aim of this data collection stage. I also explained that the data collection process would be held online - in the Cisco WebEx video conferencing platform and asynchronously - in Google Documents, one after another. Besides, I attached the informed consent form, introducing the research topic, the aim of the research, potential benefits, risks, confidentiality statement, and contact information of the researcher, and waited for the replies. Participants were informed about their option to withdraw from the study any time without causing any harm to the study. Logically, I should have asked participants to sign a consent form. However, since the data collection took place online, and not everyone had the opportunity to print and scan signed consent forms, a written agreement signified that participants voluntarily signed it.

After the recruitment process finished, I sent out additional information about the group discussion process to participants with sample leading questions and a list of existing e-learning competencies taken from McVay (2000); Watkins (2003); Parkes, Stein and Reading (2015), and provided two options for the time of an online meeting. By sharing lists of existing e-learning competencies, I expected that the participants would prepare for the discussion and would form a general understanding of the e-learning competencies. Also, I clarified that the data will be destroyed approximately four months after thesis submission and defense.

Concerning the online video conferencing platform WebEx, I explained that I would not video record the meeting but would audio record the discussion process to the Dictaphone in order to transcribe it later for the analysis. The expected duration of group discussions was about 40 minutes to 1 hour. At the agreed time (02/16/2021 and

02/18/2021), the participants gathered in the WebEx platform, where I introduced them to the current state of affairs, and said what I expect from the discussions. At the beginning of the group discussion, I thanked them for accepting the invitation and gave final regulations about the discussion. To make sure participants understood everything correctly, I brought out a shortlist of exemplary e-learning competencies on a slide, and the group began the discussion. As a moderator, I started to ask open-ended questions one by one, and the whole activity was to determine the most necessary e-learning competencies in the context of this particular university. During the meeting, I tried to note down all the important discussion details. Interestingly, while some of the participants were dominating the discussion due to personality traits, none of them was tense or reserved. I believe this is due to the differences in age, experience, status and personality of each participant.

Moving to the stage of asynchronous work in Google Documents, I prepared the spaces for each participant in one shared Google document, where they had to finalize their personal lists of e-learning competencies and could reflect on lists of other participants to make adjustments to their own lists and help other respondents. Within one week, participants provided me with their own lists of competencies, explaining why this particular competence is important for students of this particular university. In detail, respondents firstly wrote down their suggested e-learning competencies, then put them in order from more important to less important, and then reflected on the proposed lists of other participants. Finally, after qualitative data collection ended, I started transcribing the online group discussions and code lists of e-learning competencies from Google Documents.

Quantitative web-based survey for students and teaching staff

Turning to the web-based quantitative survey for students and teaching staff, it was developed after the participants of group discussions formed a list of most required students' e-learning competencies. The researcher analyzed competencies and developed the Likert

scale survey that reflects the competencies from the list. Both students and teachers were asked to rate student preparedness for distance learning based on e-learning competencies from the qualitative stage. The competencies from the list were redesigned as a questionnaire, with five-point Likert scale items, where 1 is low, and 5 is high. The literature suggests that a five-point scale appears to be less confusing and increases the rate of responses (Babakus & Mangold, 1992; Devlin et al., 1993; Hayes, 1998). Along with that, Marton-Williams (1986) noted that a five-point scale is readily comprehensible to respondents, making it easier to go through the survey. Additional demographic variables in the survey, such as year of study, specialty, gender, were added to serve as a narrowing tool for manipulating the data.

Since the random sampling technique was applied here, I contacted the gatekeeper, the director of the Quality Assurance Division of the university, to allow me to send the survey link to all students and teaching staff. After getting the permission for mailing, I prepared the survey in English, Kazakh and Russian languages, attached the consent letter with brief information about the study and all required details, and sent the survey to all students and teaching staff separately. The survey was available to fill in for two weeks, and I sent one reminder after one week. In total, among more than six thousand students, I have received 1 436 responses and 43 responses from more than 250 teachers.

Ethical issues

The study guarantees the anonymity of the participants' identities and their responses throughout the research procedure to all reviewers and readers. In order to do this, all the direct identifiers were replaced or encoded. The names are known only by the researcher, and pseudonyms were used. Throughout the thesis writing process, electronic data were stored on the researcher's laptop and in Google Drive, where they are protected by a password. Furthermore, data was kept private with shared access only to the thesis

supervisor. The data will be destroyed approximately four months after thesis submission and defense.

Limitations of the study

Among the limitations of this study, the data collection period is particularly noteworthy. Despite the fact that the topic implies the preparedness of the students during the emergency transition to distance learning, the data was collected when the students had already studied online for one semester. Therefore, the data may be slightly distorted since in one semester, students could develop some skills for online lessons. Ideally, the data should have been collected during the Spring-2020 or before the Fall-2020 academic semester.

Another limitation of this work is in the stage of collecting qualitative data. In the process of group discussions, I was forced to provide the participants with an approximate list of e-learning competencies, so that they could understand what e-learning competencies look like and what the outcome of the discussion should be at the end. The lists which I provided may have influenced the way university stakeholders collectively brainstormed, and some e-competencies might have been taken directly from there. However, it should be noted that participants did a great deal of work in identifying the most required e-learning competencies for the students of the particular university.

Finally, being a novice researcher and dealing with online education myself may bring some biased ideas to the research in general.

Data analysis procedures

Qualitative data analysis

After the qualitative data collection was completed, the initial step was to transcribe online group discussions and then move to personal lists of the most needed students' e-learning competencies in Google Documents.

As it was already mentioned, during online group discussions, the participants shared their suggested e-learning competencies and relied on the list that was sent previously, which turned out to be more convenient for me, as a researcher, to code the obtained qualitative data relying on the literature. The method of coding I applied for my study is called thematic analysis or structured coding. It refers to the conditions when the researcher has a list of codes or themes beforehand, and all he has to do is to match the data to existing codes and themes. Along with that, it is worth noting that I was still prepared for unexpected results.

Next, after each group discussion, I verbatim transcribed recorded sessions within a few days, and applied the structured coding technique, where I relied on existing e-learning competencies and was searching for similar ones in the discussions. Verbatim transcription was compulsory, so I could analyze participants' words directly, not a paraphrase, as re-listening and re-reviewing may yield insights to make sense of the data (Lapadat & Lindsay, 1999). After transcribing, I prepared a list of dimensions for e-learning competencies, where I was able to put together similar or connected competencies. Precisely, three main dimensions were formed where most competencies could be put together.

Next, I proceeded to the analysis of the individual lists of e-learning competencies prepared in Google documents. From 10 participants, I had 10 lists with approximately 7 to 10 e-learning competencies in each. I have written the codes for competencies and arranged them into themes (dimensions). Later on, I joined many codes and was able to reduce the number of items in each dimension. I have used emerging and predetermined codes, as well as created several new codes. Final list consisted of three dimensions of e-learning competencies with six to eight competencies in each.

Quantitative data analysis

Moving on to the procedure for analyzing quantitative data, presented in the form of a web-based survey for students and teachers on a five-point Likert scale, it is worth noting that it all started with data cleaning, measuring internal consistency and reliability of the survey questions. For that, I used the Z-value test, Factor Analysis and Cronbach's Alpha. Afterwards, I started to work on defining general descriptive statistics about the number of participants, percentage of respondents by gender, year of study, faculties. For the analysis of demographic variables, I used frequency and percentage tables for nominal variables, which resulted in data tabulation.

After analyzing demographic variables, I proceeded to the descriptive and inferential data connected to my research questions. Since the second and third research questions involve measuring the preparedness of students for compulsory distance learning, I needed to find a suitable tool that would show an overall picture of students' preparedness for online learning in different dimensions separately. It was decided to use the Mean of all variables. Since the data were normally distributed, did not contain significant outliers, and the variable was scaled as an interval, this approach best suited to the conditions at hand. To conclude the process, I also needed to apply the Standard Deviation to find how far measurements were spread from the average, which might have been significant in observing how much students' preparedness for emergency remote education differs from each other individually. Basically, I needed to work with the means of each e-learning competence, with each of the three dimensions, and with one common mean that combines all three dimensions together. Additionally, I wanted to build the connection between the second and third research questions, as they were both directed to measure student preparedness. While the second question was intended for students to evaluate their e-learning competencies, the third research question implied teachers to measure student preparedness. Since demographic

variables allowed us to match students from one faculty to teachers of the same faculty, we could compare whether there are any differences in how well students measure their own preparedness and teachers evaluate students' preparedness. The difference could be noted within each e-learning competence, dimension, and as an overall tendency.

Moving to the data analysis procedures for the fourth research question, which is about the relationships of e-learning competencies and students' academic performance, it was decided to apply Spearman's correlation. In this research, it helps to measure the strength and direction of the relationship of e-learning competencies to students' GPA score. Moreover, since GPA is an ordinal variable, it is suggested to apply Spearman's correlation coefficient, as a measure of the relationships between e-learning competencies and academic performance.

Moving to the final research question about possible differences in the preparedness level of students from various populations for emergency remote education, an independent samples T-test and One-Way ANOVA (Analysis of Variance) were applied. Particularly, One-Way ANOVA was used to compare the means of preparedness for emergency remote education of students of different faculties, and years of study.

Conclusion

To conclude, this chapter presented and described the chosen research design, data collection methods and instruments, sampling procedures, research site, ethical issues, limitations and data analysis procedures of the study about measuring student preparedness for compelled distance learning at one university in Kazakhstan. The following chapter presents the findings revealed from the group discussion and web-based survey.

Chapter 4: Data Analysis and Findings

In this chapter, I will describe the data analysis of the research and demonstrate findings. In the context of this research, it was possible to identify students' corresponding e-learning competencies for effective performance during compelled distance classes, and measure learners' preparedness level for emergency remote education in one Kazakhstani private university. Also, we could reflect on the correlation of students' e-learning competencies with academic performance during the distance learning period, and determine differences in the level of preparedness of students of different genders, faculties and years of study.

There were five research questions to be answered in this study and to understand the phenomenon of student preparedness for emergency remote education. They are as follows:

1. What are the students' primary e-learning competencies required for effective performance during compelled distance learning?
2. To what extent students from one private university in Kazakhstan rate their preparedness for compelled distance learning?
3. To what extent does teaching staff from one private university rate students' preparedness for compelled distance learning?
4. Is the relationship between e-learning competencies and students' academic performance significant?
5. Is there a difference in the preparedness level of students of different genders, faculties, and years of study for emergency remote education?

The data analysis and findings chapter is organized in six sections. To answer the research questions, the mixed-method research design was used. So, I conducted focus group discussions with university stakeholders and ran web-based questionnaires.

Moving onto the detailed structure of the chapter, in the first section I will describe demographic characteristics of the participants. Then, I will analyze and present the findings about the most important e-learning competencies required for effective performance during compelled distance learning. After that, I will share the results of a survey on how well students rate their preparedness level for emergency remote education based on their e-learning competencies. Along with that, teachers' attitudes toward student preparedness for compelled distance learning is also referred to. Next, the descriptive and inferential analysis about the relationship between e-learning competencies and academic performance will be displayed. Finally, the findings about differences in the preparedness level of students of different genders, faculties, and years of study will be presented. To complete all this, I will apply qualitative data analysis techniques: memo coding, structured coding; and quantitative data analysis techniques: mean of all variables, Spearman's correlation, independent samples T-test, and One-Way ANOVA (Analysis of Variance) tests. So, while the qualitative data was verbatim transcribed and structurally coded; the quantitative data was cleaned, coded and inserted into the SPSS program. In consort with that, Factor Analysis and Cronbach's Alpha were implemented to find the consistency of the questions in the survey and to check the reliability of the survey.

Demographic characteristics of the participants

Before reporting the findings, it was decided to refer to the demographic characteristics of the participants. This section portrays the demographic data of the participants in the qualitative and quantitative data collection.

For qualitative data collection, ten participants were involved. Among them three teachers, three administration team members and four students. In total, there were 6 female and 4 male participants. Within the 6 university staff members, 5 have more than 5 years of experience. The general attitude toward distance education was equally reported as 5 people

- positive and 5 - negative. Amid the students, there were not any freshmen as they were considered having minor experience in distance learning at university level.

Table 3

Demographic characteristics of the participants of group discussions

#	Participant	Gender	Work experience/ year of study	Attitude toward distance learning
1	Student 1	female	2	negative
2	Student 2	female	2	negative
3	Student 3	male	3	positive
4	Student 4	female	4	positive
5	Teacher 1	male	8	positive
6	Teacher 2	female	4	positive
7	Teacher 3	female	11	negative
8	Administration 1	male	11	negative
9	Administration 2	male	6	negative
10	Administration 3	female	10	positive

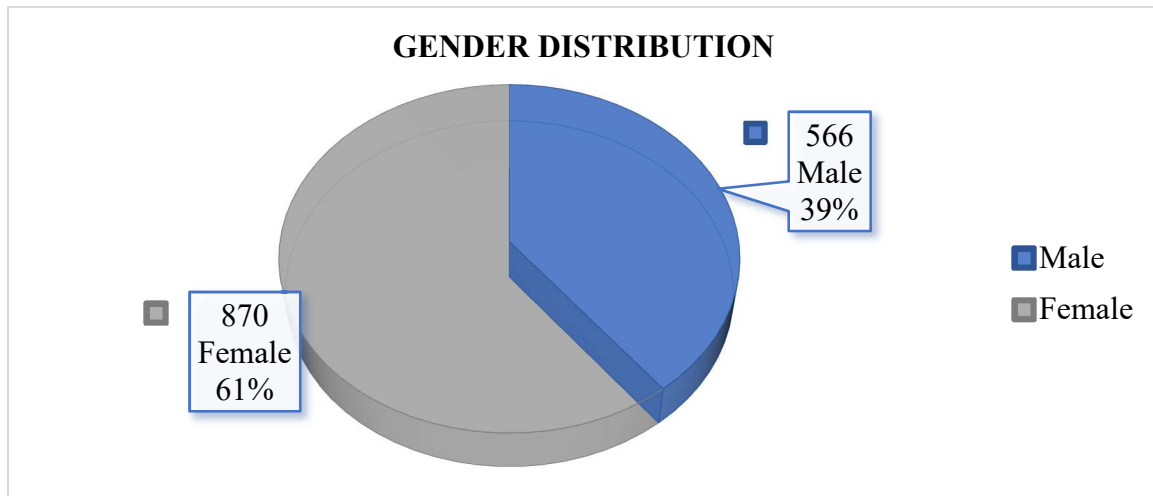
Note. Participants were selected based on their previous experience in distance learning

Moving to demographic statistics of the web-based survey for students, the survey population was 5,623 students, and response rate was 1,436 (25,5%) students from four faculties and 22 study programs. I used Frequency and Percentage figures for nominal variables, which resulted in data tabulation. The Figures below present demographic characteristics of the students, participated in a web-based survey.

Figure 3 shows the gender distribution, and it could be noticed that 6 out of 10 survey participants are female students.

Figure 3

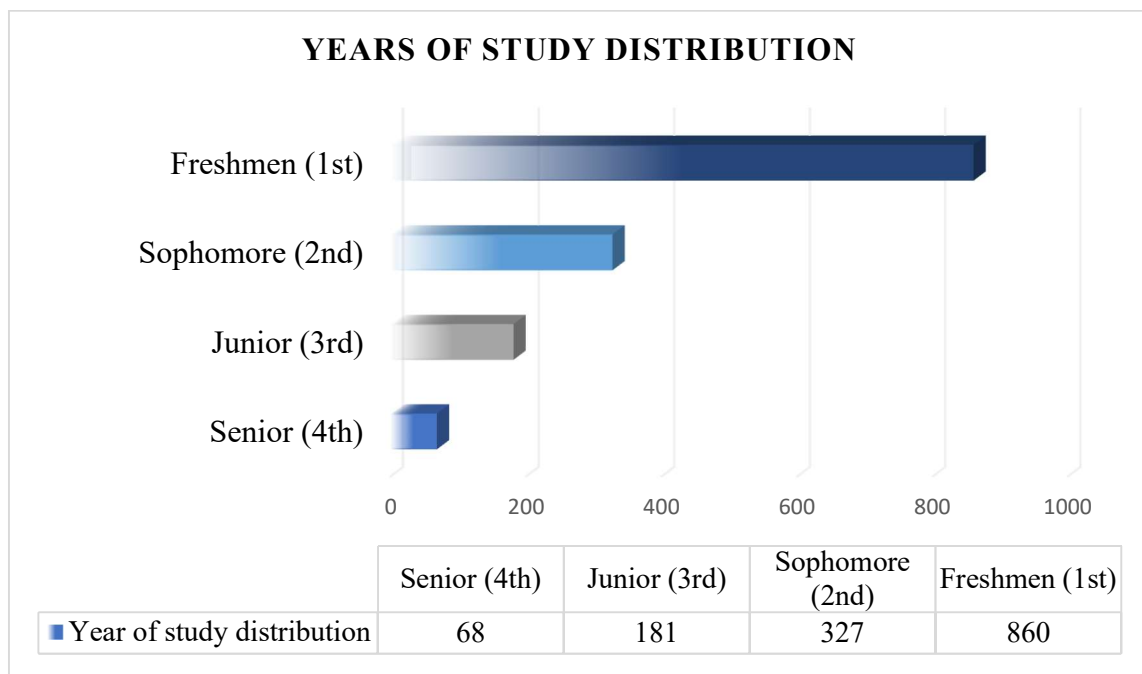
Student-respondents' gender distribution



Next, Figure 4 demonstrates the survey respondents' distribution by the year of study, almost 60% of the respondents are 1st year students, when the least active group is the 4th year students.

Figure 4

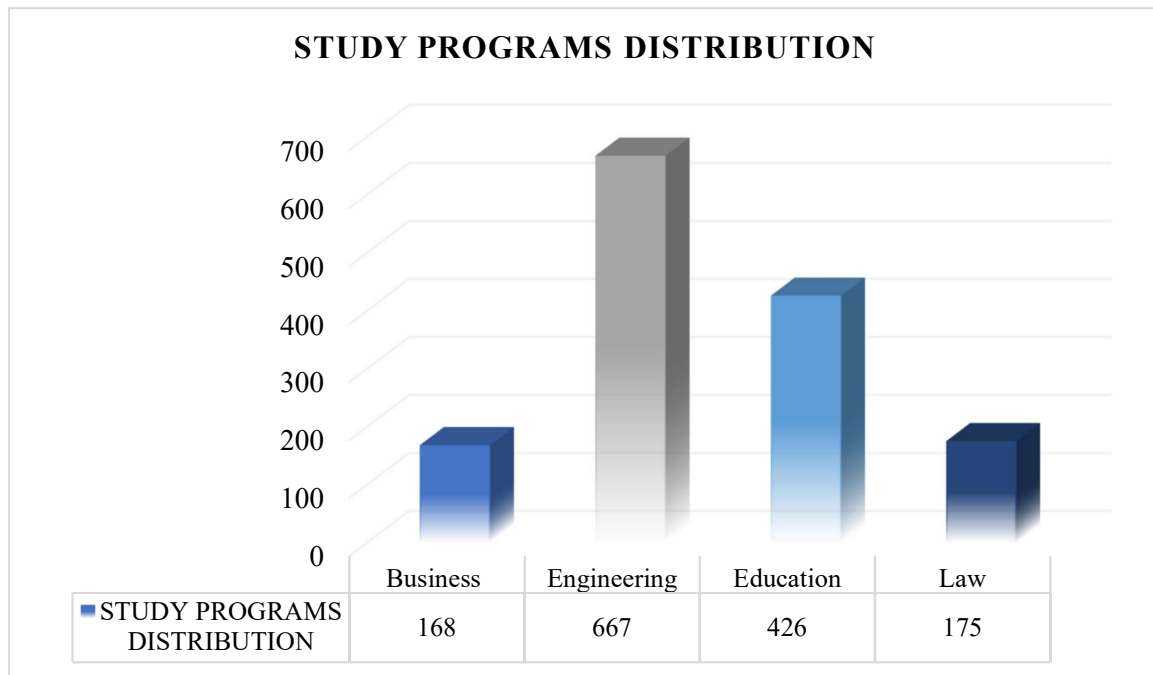
Student-respondents' distribution by year of study



According to study programs, students were divided into 4 faculties. Figure 5 displays that about half of the students are from engineering faculty, while law and business students are less than 25% together.

Figure 5

Student-respondents' distribution by study programs



Parallely to students, the teaching staff members were also asked to complete a web-based survey, and 43 teachers from 4 faculties responded. Again, I used frequency and percentage figures for nominal variables, which resulted in data tabulation. The Figures 6 and 7 present demographic characteristics of the teaching staff representatives, who participated in a web-based survey.

Gender distribution among teaching staff members had similar patterns with students and indicates that 65% of all respondents are female teachers.

Figure 6

Teacher-respondents' gender distribution

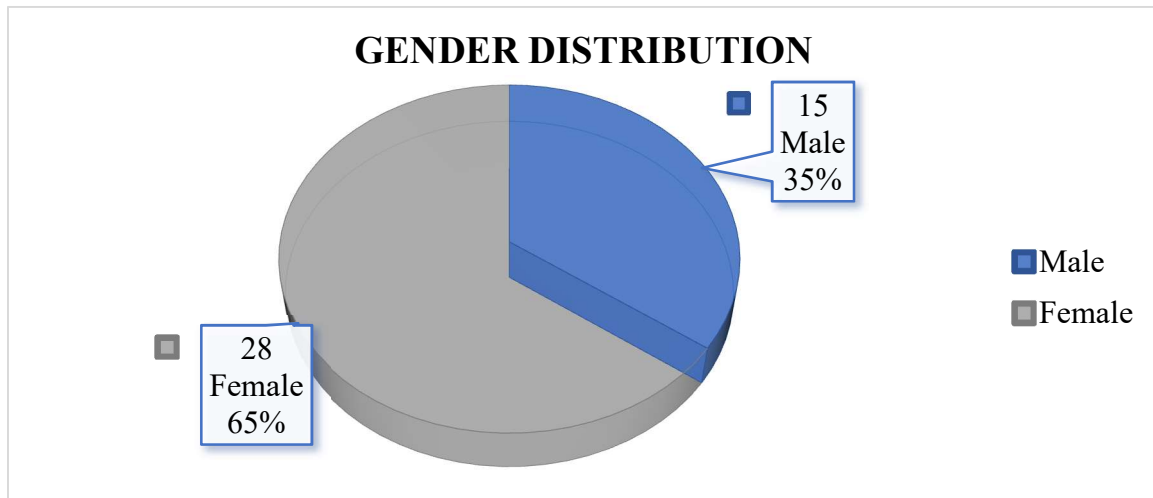
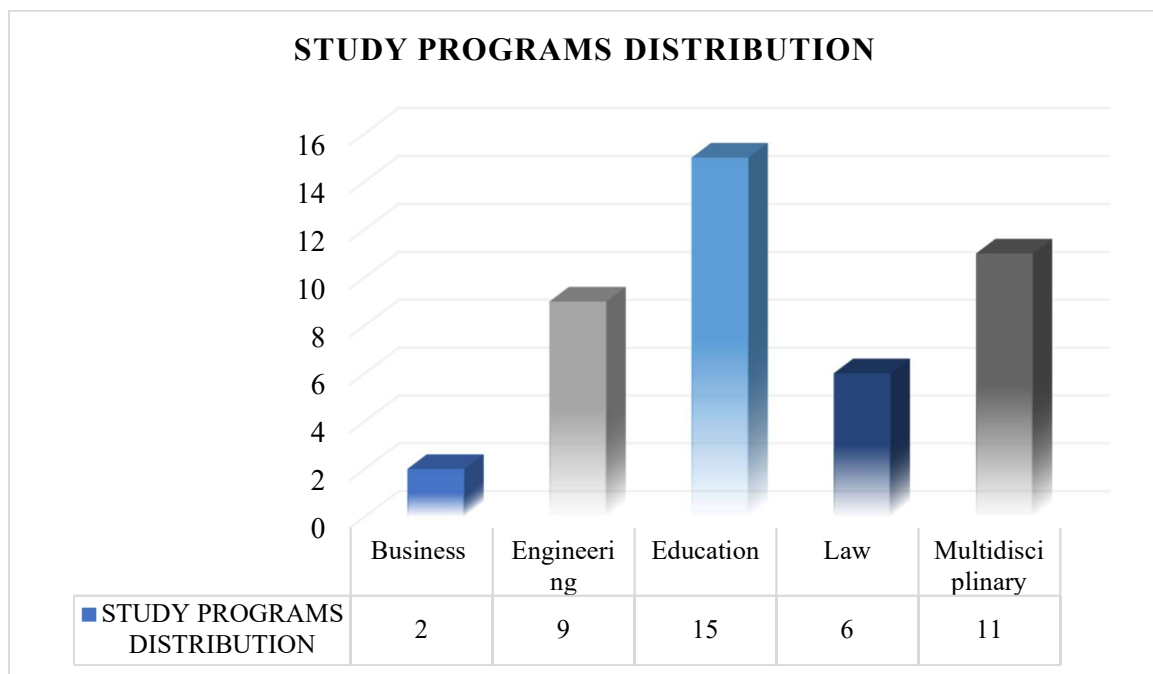


Figure 7 illustrates at which faculty do teachers work. It can be noticed that the number of education faculty teachers is dominating with 35%. Also, there are 11 teachers who teach multidisciplinary courses at several faculties.

Figure 7

Teacher-respondents' distribution by faculties they work at



RQ1: What are the students' primary e-learning competencies required for effective performance during compelled distance learning?

As it was already mentioned, the initial question in this research was to identify student e-learning competencies required for compelled distance learning. This was planned to be accomplished in two steps, which are online focus group discussions and subsequent individual formulation of competencies in Google Documents.

For the purpose of the first step, ten university stakeholders were asked to participate in group discussions with the final aim to collectively develop a list of e-learning competencies through Social Constructivist Framework, and discussing over open-ended leading questions.

For the analysis of online group discussions, I verbatim transcribed the discussions and applied memo coding, which is about highlighting a word, line, sentence or even a paragraph and giving it a label (Rapley, 2011). This helped me to trace the ideas of the participants and identify common patterns of competencies that were later grouped together. Despite the fact that participants could not clearly state e-learning competencies at the beginning, they progressed in finding sets of skills for successful online learning by answering leading questions. This helped a lot during the second step, where participants were asked to propose their own individual lists of e-learning competencies in Google Documents. Discussions served as a collaborative formation of accepted-by-all categories of competencies (dimensions) that students need to have in order to succeed during online classes.

Analyzing the group discussions, it came to the attention that the background of participants affected which e-learning competencies they considered more important for students. For example, Teacher 1 from engineering faculty is more than sure that competencies that are related to the application of learning tools are way more important

than being able to cope with a huge amount of assigned homework. The reason for this may be the fact that students of the engineering faculty use a huge number of different platforms, training programs, but the number of tasks is less, compared to other faculty students. At the same time, students of the education faculty use a limited number of tools to complete a huge number of tasks, so they considered multitasking related competencies to be more important.

Starting from the beginning of the pandemic and lockdown, disagreements in families have increased. The reason for this may be the fact that a large number of people are sitting at home and the house has become a place of both daily life and a place of work and study, which in turn removed all boundaries between these areas of life. Therefore, Student 2 and Student 3, as well as the Teacher 2 mentioned that an extremely important skill for learning during a pandemic is the ability to separate work or studies from everyday family life.

The administration staff representatives believe that the most necessary competencies that students need are the ability to use applications, platforms that teachers use, and be able to allocate time well for assignments. Teachers and students alike feel that these skills alone are not enough to be successful in online learning.

Additionally, it is worth mentioning that Teacher 2 and Teacher 3 said that students who were once more active during traditional learning became quieter, not as active as they were before. They said that the reason for this is shyness and inability to feel comfortable and free during online learning, compared to traditional learning. The ability to freely express thoughts via web-camera, not to be afraid to ask for clarification in case of misunderstanding also could be considered as an essential e-learning competence.

There also were some skills that were mentioned by almost all participants. Since emergency remote education is something new for our country, students also encountered problems related to poor internet connection or because of some other inconveniences

related to teacher-led classes, so “self-study related skills are something required for each and every student”, participants say. Teachers claimed that assigning a task for a group of students was something that they started to deal with more frequently since the beginning of online classes. In this regard, all teachers and students mentioned that it was harder to work in a group during online learning. Connectedly, teamwork, ability to work in groups is another essential skill.

Furthermore, during transcribing the discussions, there were frequently mentioned words then taken as keywords. These keywords were: ability to work productively, time management, basic technical skills, online learning tools, online interaction.

After the discussion, it was hard to precisely define all the e-learning competencies that were considered important for compelled distance learning. But it was much easier to categorize the skills mentioned by the participants into three dimensions. These dimensions are related to (a) the management of the online studying process, (b) ability to work with the given materials and tasks, and (c) the ability to keep in touch with people who are somehow related to the learning process. After referring to the literature in the field, three dimensions for this study were formed as:

-Management of learning process at the e-learning environment;

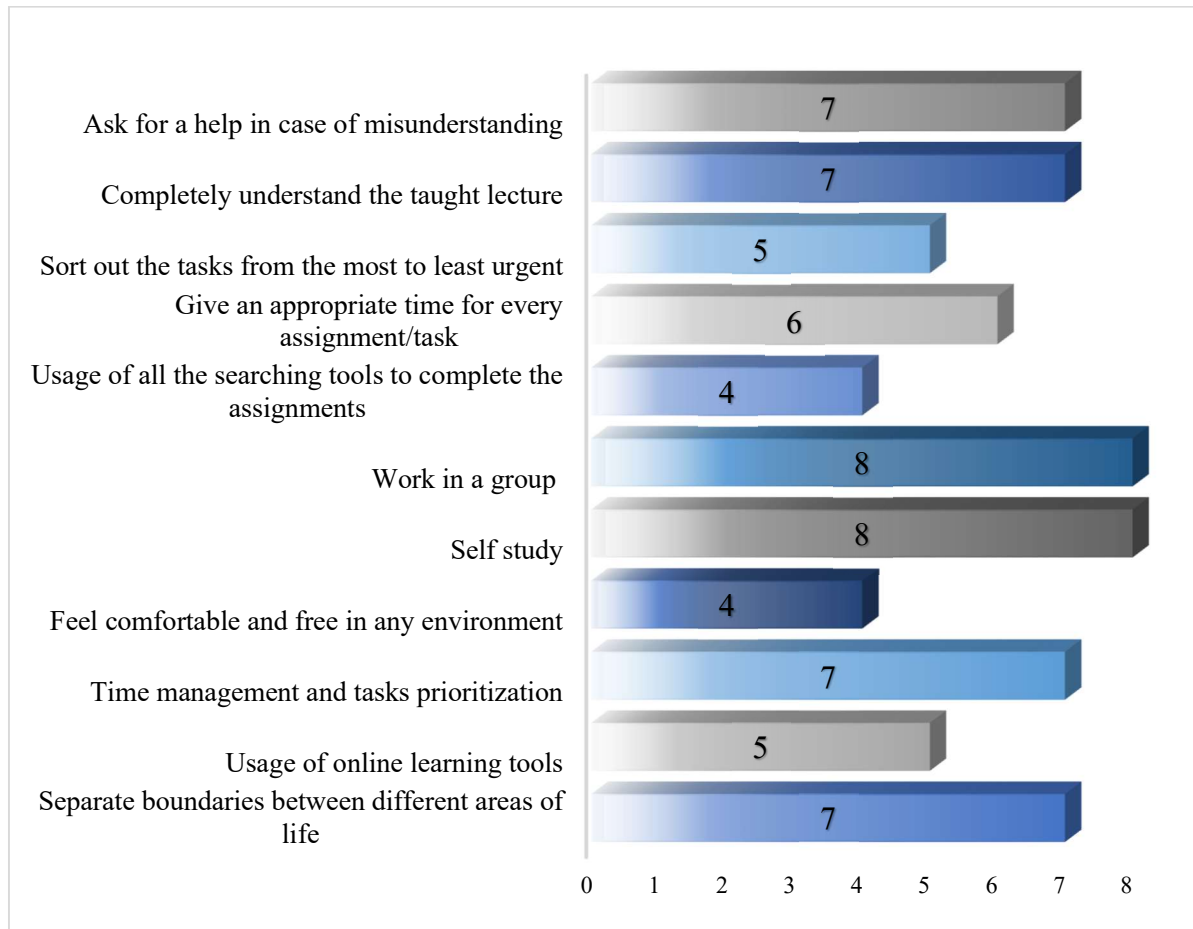
-Interaction with the learning content during distance learning;

-Interaction with the e-learning community.

After the group discussions, participants had one week to write their own individual lists of most important e-learning competencies in Google Documents separately. The Figure below shows e-learning competencies, most frequently mentioned by the participants in Google Documents.

Figure 8

E-Learning competencies most frequently mentioned by university stakeholders



Furthermore, analyzing and coding the lists from Google Documents, 22 essential e-learning competencies divided into three dimensions were found, they are in the list below.

Table 4

Final list of the most important e-learning competencies divided into three dimensions

Dimension	code	E-learning competencies
Management of the learning process at the e-learning environment.	X1	- ability to balance work, social life, family and remote studies;
	X2	- ability to adapt own learning style to distance learning;
	X3	- ability to plan an appropriate strategy to undertake a project task;
	X4	- ability to prioritize competing tasks within the time available;

	X5	- ability to arrange schedule for regular online sessions and work in a strict timeframe;
	X6	- ability to use search engines in the Internet effectively and strategically;
	X7	- ability to use a web browser with skill and purpose.
Interaction with the learning content during distance learning	Y1	- ability to distinguish between relevant and irrelevant information;
	Y2	- ability to process and work with the large bodies of content;
	Y3	- ability to form connections between prior knowledge and new knowledge;
	Y4	- ability to identify and rectify gaps in one's own understanding;
	Y5	- ability to read and type at an appropriate level;
	Y6	- ability to download and upload information and resources to/from required platforms;
	Y7	- ability to identify the requirements and instructions that are necessary to complete a task;
	Y8	- ability to go outside the technology and learning community to seek information.
Interaction with the e-learning community	Z1	- ability to feel comfortable to ask for guidance or seeks clarification for misunderstandings;
	Z2	- ability to provide responses in clear, concise and unambiguous language;
	Z3	- ability to apply the rules of netiquette consistently and respond to others with respect;
	Z4	- ability to seek information through either my own enquiries or the questioning of others;
	Z5	- ability to determine when it's time to 'listen' to or contribute a response;
	Z6	- ability to work with others to collaboratively construct knowledge;
	Z7	- willingness to have ideas challenged.

Note. Competencies that will be used to measure students' preparedness for emergency remote education

RQ2: To what extent students from one private university in Kazakhstan rate their preparedness for compelled distance learning?

The second research question involves the use of a five-point Likert scale survey, created as a proprietary research instrument based on previously identified e-learning competencies. Therefore, in order to find consistency of questions and validate the reliability of the survey, Factor Analysis and subsequent Cronbach's alpha test were implemented

before actual analysis. Along with that, the data cleaning procedure was implemented by detecting the normality of distribution and eliminating the outliers through checking the Skewness and Kurtosis coefficients. After cleaning the data, the means of each e-learning competence were compared to each other, and students' preparedness level for compelled distance learning was found. So, the answer to the second research question helped to determine the extent to which students rate their preparedness for compulsory remote education.

Data cleaning

To clean the data, the Skewness and Kurtosis coefficients were checked. As a standard rule for Z-values, it was decided to change the items where the Z-values were out of -3 and +3. The outliers were replaced with average values, which normalized the overall coefficient. Together with that, several missing values were detected and excluded from the analysis. Significant outliers were detected in the “interaction with the learning content” dimension. The elimination of outliers led to the data normalization, which impacted on the obtaining of clean data. Finally, after data cleaning procedure 1 396 responses were left out of initial 1 436. Statistically, the values were considered acceptable after cleaning, since the distribution lies between -2 and +2.

Table 5

Skewness and Kurtosis coefficients after data cleaning

	N	Std. Deviation	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
X1	1396	1,247	-,346	,065	-,850	,131
X2	1395	1,263	-,661	,066	-,607	,131
X3	1393	1,226	-,520	,066	-,642	,131
X4	1392	1,197	-,641	,066	-,487	,131
X5	1394	1,260	-,558	,066	-,758	,131
Y1	1393	1,109	-,650	,066	-,284	,131
Y2	1395	1,139	-,401	,066	-,588	,131

Y3	1390	1,090	-,651	,066	-,210	,131
Y4	1394	1,095	-,577	,066	-,349	,131
Y5	1396	,921	-1,124	,065	,163	,131
Y6	1396	,904	-1,248	,065	,472	,131
Y7	1393	,977	-,818	,066	-,486	,131
Y8	1385	1,211	-,812	,066	-,272	,131
Z2	1392	1,131	-,616	,066	-,393	,131
Z3	1388	,965	-1,604	,066	1,870	,131
Z4	1389	1,011	-1,292	,066	1,190	,131
Z5	1389	1,043	-1,163	,066	,788	,131
Z6	1391	1,246	-,943	,066	-,195	,131
Z7	1391	1,119	-1,055	,066	,333	,131
Valid N (listwise)	1330					

Note. This table reports the summary statistics on Skewness and Kurtosis coefficients. The acceptable distribution lies between -2 and +2

Factor Analysis of web-based survey for students

To find the consistency of questions in the web-based survey for students and to prove that all proposed items in the survey are in three dimensions, Factor Analysis was implemented. After testing, it was evidenced that all competencies in the “Interaction with the learning content during distance learning” (Y) dimension were grouped together as well as all competencies in “Interaction with the e-learning community” (Z) dimension. However, Factor Analysis demonstrated that “Management of learning process at the e-learning environment” (X) dimension competencies were broken into two different dimensions as it is shown in Table 6. In other words, it says that competencies from X1 to X5 are interrelated and belong to one dimension, whereas X6, X7 are outlying competencies of different dimension.

Table 6

Initial Factor Analysis

Component	Extraction Sums of Squared Loadings	Rotation Sums of Squared Loadings		
	Cumulative %	Total	% of Variance	Cumulative %
1	46,413	4,443	20,196	20,196
2	54,627	4,394	19,971	40,168
3	62,048	4,363	19,830	59,998
4	68,089	1,780	8,091	68,089

Note. Total Variance Explained. Extraction Method: Principal Component Analysis

	Component			
	1	2	3	4
x1	,791	,182	,166	,018
x2	,788	,183	,211	,050
x3	,773	,288	,266	,032
x4	,728	,296	,259	,009
x5	,719	,239	,271	,028
y6	,095	,799	,275	,027
y5	,158	,778	,260	,013
y7	,266	,727	,322	,031
y8	,301	,665	,261	-,024
y4	,420	,612	,287	-,024
y2	,521	,582	,223	,007
y3	,481	,581	,277	,003
y1	,456	,572	,222	-,016
z4	,157	,306	,766	,014
z7	,174	,198	,745	-,019
z3	,099	,355	,730	,016
z5	,216	,319	,725	,044
z6	,323	,194	,692	,009
z2	,316	,307	,661	-,011
z1	,390	,105	,623	-,015
x6	,020	,022	-,001	,941
x7	,050	-,010	,013	,939

Note. Rotated Component Matrix^a. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser. Normalization.^a a. Rotation converged in 6 iterations

Since we proposed and worked with three dimensions only, it was decided to exclude X6 and X7 outlying competencies. After eliminating X6 and X7 variables, we met the initial requirements concerning three dimensions. Table 7 below demonstrate the Factor Analysis

results after excluding outlying e-learning competencies. Overall, Factor Analysis helped to validate the internal consistency and eliminate outliers.

Table 7

Post Factor Analysis

Component	Extraction Sums of Squared Loadings	Rotation Sums of Squared Loadings		
	Cumulative %	Total	% of Variance	Cumulative %
1	50,993	4,457	22,286	22,286
2	59,322	4,388	21,942	44,228
3	65,935	4,342	21,708	65,935

Note. Total Variance Explained. Extraction Method: Principal Component Analysis

	Component		
	1	2	3
x1	,789	,181	,168
x2	,788	,182	,212
x3	,773	,288	,265
x4	,731	,294	,254
x5	,723	,235	,270
y6	,095	,798	,280
y5	,157	,777	,265
y7	,265	,728	,325
y8	,302	,661	,264
y4	,424	,612	,283
y3	,481	,584	,273
y2	,524	,583	,216
y1	,460	,572	,216
z4	,159	,308	,764
z7	,176	,196	,740
z3	,099	,357	,730
z5	,216	,318	,726
z6	,320	,197	,694
z2	,316	,311	,656
z1	,393	,104	,620

Note. Rotated Component Matrix^a. Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser. Normalization.^a a. Rotation converged in 6 iterations

Cronbach's alpha test of web-based survey for students

After proving that the questions in the survey were consistent and eliminating two outlying e-learning competencies items from the analysis, it was decided to validate the reliability of the survey in general. To do that, Cronbach's Alpha test was used.

Table 8

Reliability of the survey for students

Cronbach's Alpha	N of Items
,948	20

The table above shows that Cronbach's Alpha is 0,948 which indicates a high level of internal consistency. Excellent internal consistency means that all items in the survey can be considered as a group.

Mean of all variables

After preparing the data, we proceeded to actual analysis and findings related to the second research question. It was decided to calculate the mean scores of how students assess their e-learning competencies one by one and in dimensions separately.

It was found that students highly measure their preparedness for distance learning in general, as the mean score for all competencies was about 3,84 out of 5,0. Students considered that their e-learning competencies related to the management of virtual learning process is slightly lower than in other two dimensions. Furthermore, "Interaction with the e-learning community" related competencies were revealed to be most highly developed, compared to others. Interestingly, the standard deviation of the scores among "The management of virtual learning process" related competencies was slightly higher than in other two dimensions, which indicates that the data was more spread. The top 3 most developed e-learning competencies among one private university students are the following:

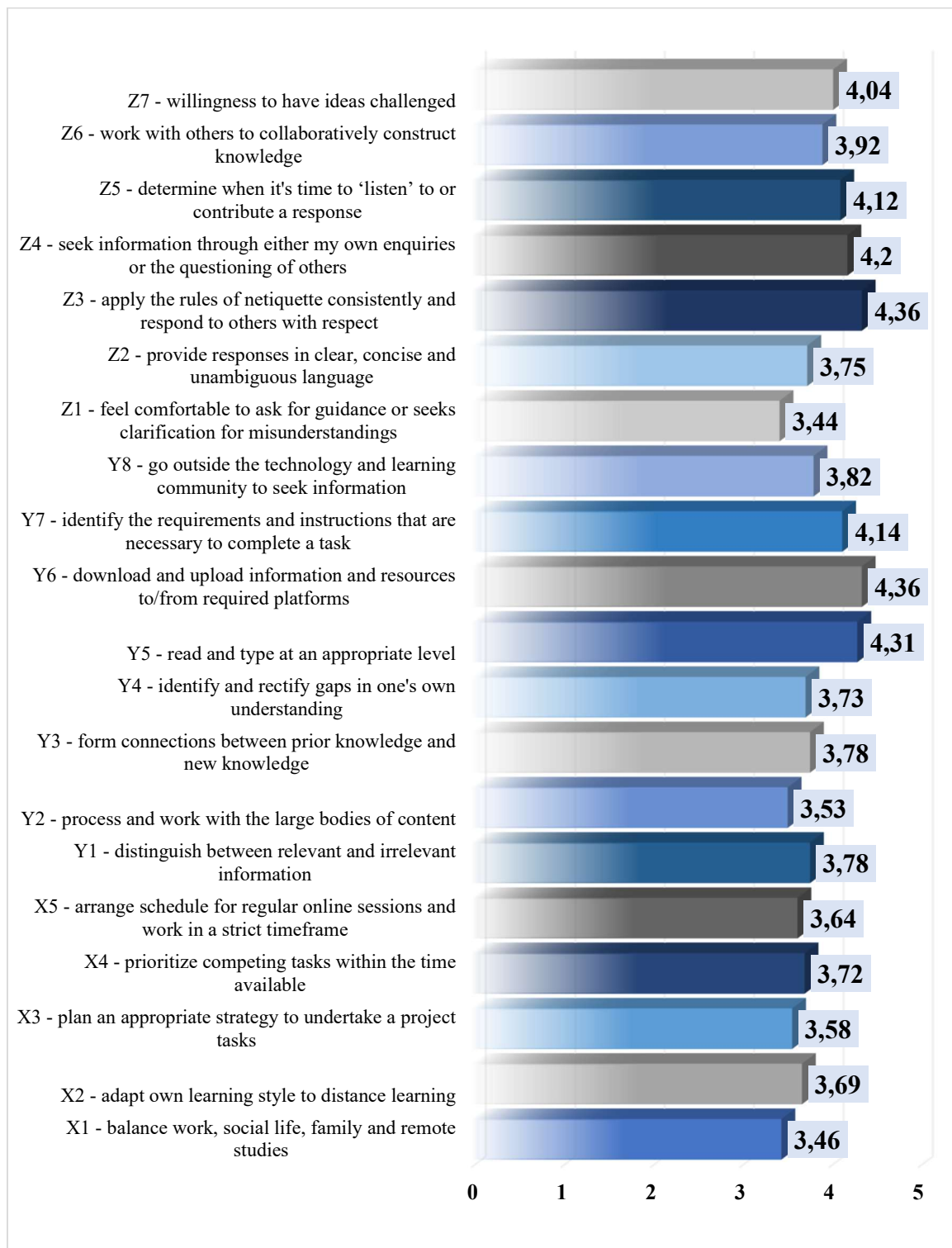
- Ability to read and type at an appropriate level;*
- Ability to download and upload information and resources to/from required platforms;*

-Ability to apply the rules of netiquette consistently and respond to others with respect.

The Figure 9 below shows detailed descriptive statistics about each e-learning competence.

Figure 9

Mean scores of how students rated their e-learning competencies



To be more precise, students indicated following as their most highly developed e-learning competencies, and the mean score for them are above 4:

- *Application of the rules of netiquette consistently and responding with respect during online classes;*
- *Download and upload of information to the virtual learning platforms;*
- *Ability to read and type at the appropriate level;*
- *Ability to seek information through either own enquiries or the questioning of others;*
- *Ability to determine when it's time to 'listen' to or contribute a response;*
- *Ability to identify the requirements and instructions that are necessary to complete a task;*
- *Willing to have ideas being challenged.*

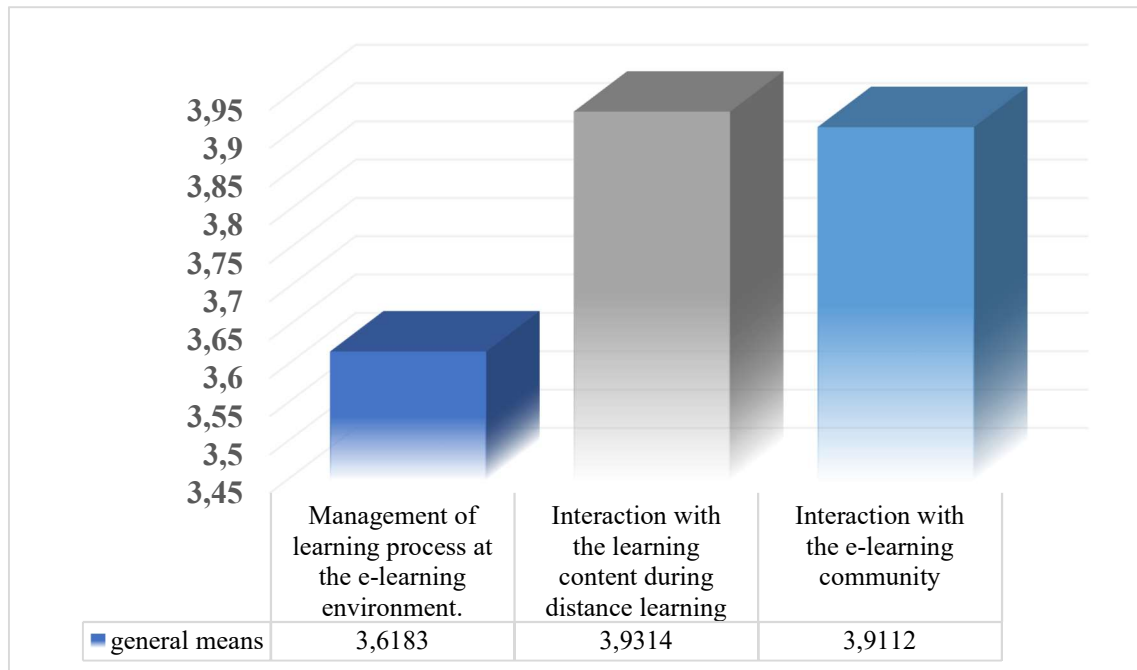
Also, there are several e-learning competencies that were least developed among students, comparing to other competencies, they are:

- *Ability to balance work, social life, family and remote studies;*
- *Ability to plan an appropriate strategy to undertake a project task;*
- *Ability to process and work with the large bodies of content;*
- *Ability to feel comfortable to ask for guidance or seek clarification for misunderstandings.*

Overall, while in general students tend to positively measure their preparedness for compelled distance learning, mastering “The management of virtual learning environment” is more difficult than “Interaction with e-learning community” and “Interaction with e-learning content”. It is also reflected in the standard deviation, where mean score for X-dimension was 0,2 points higher than Y and Z dimensions.

Figure 10

Mean scores of dimensions



RQ3: To what extent does teaching staff from one private university rate students' preparedness for compelled distance learning?

In order to avoid a one-sided vision of measuring students' preparedness for compelled distance learning, it was decided, along with a survey for students, to launch the same one for teachers and ask them to evaluate the e-learning competencies of students. We believe that this leads to a deeper understanding of the preparedness level of students for distance learning, since the opinions of students and teachers could be compared and show where the competencies were overestimated or underestimated, and where, in fact, the level of readiness corresponds. So, in addition to finding out how well students measure their preparedness level for compelled distance learning, teaching staff assessed student preparedness too. The data demonstrated teachers' perception of student preparedness for distance learning, which, in pair with student responses, shows the complete picture of preparedness level.

After cleaning the data, the mean scores of teachers' responses were taken. It was found that teaching staff highly measures student preparedness for distance learning, and the total mean score constituted 3,83 out of 5,0. Similarly to students' responses, teaching staff members considered "Management of virtual learning process" related competencies weaker than other two dimensions. Interestingly, standard deviation of teachers' responses was lower than students', which says that the teaching community share the same opinion about learners' preparedness for online studies. Figure 11 depicts the further details about means of each e-learning competence.

Figure 11

Mean scores of how teachers rated students' e-learning competencies by dimension

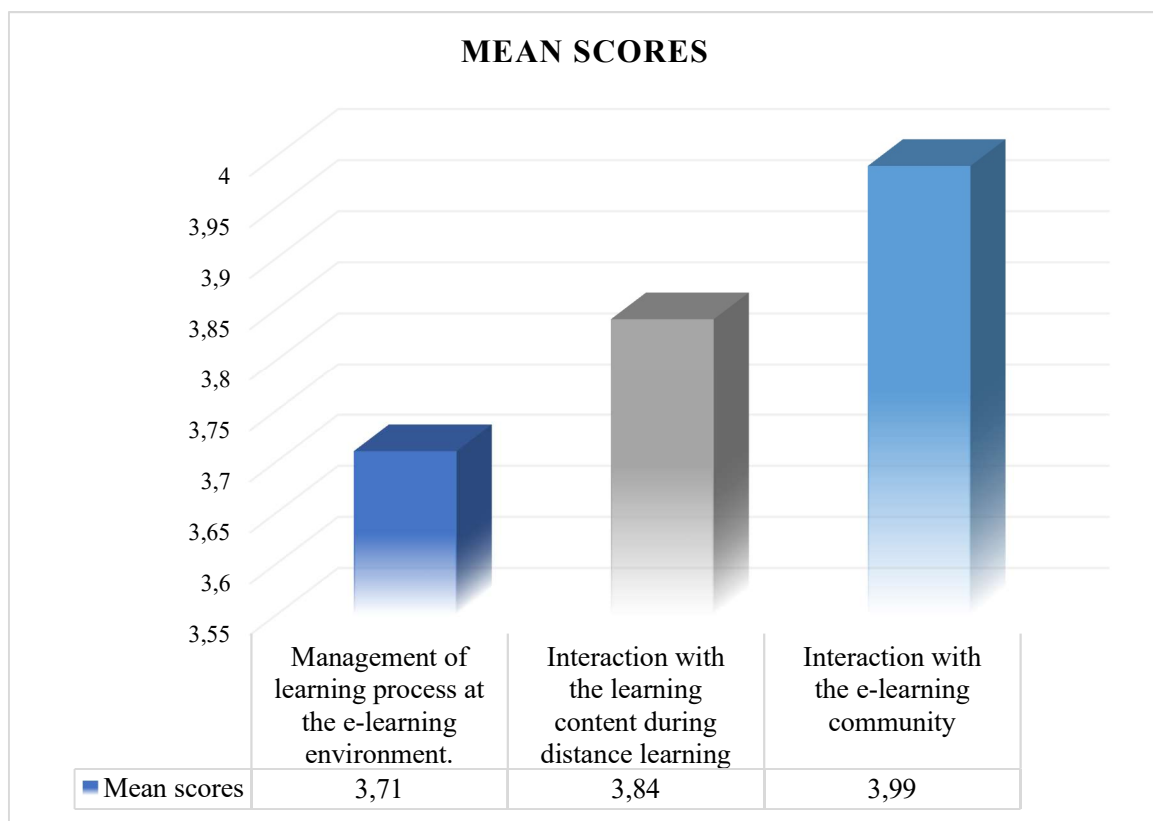
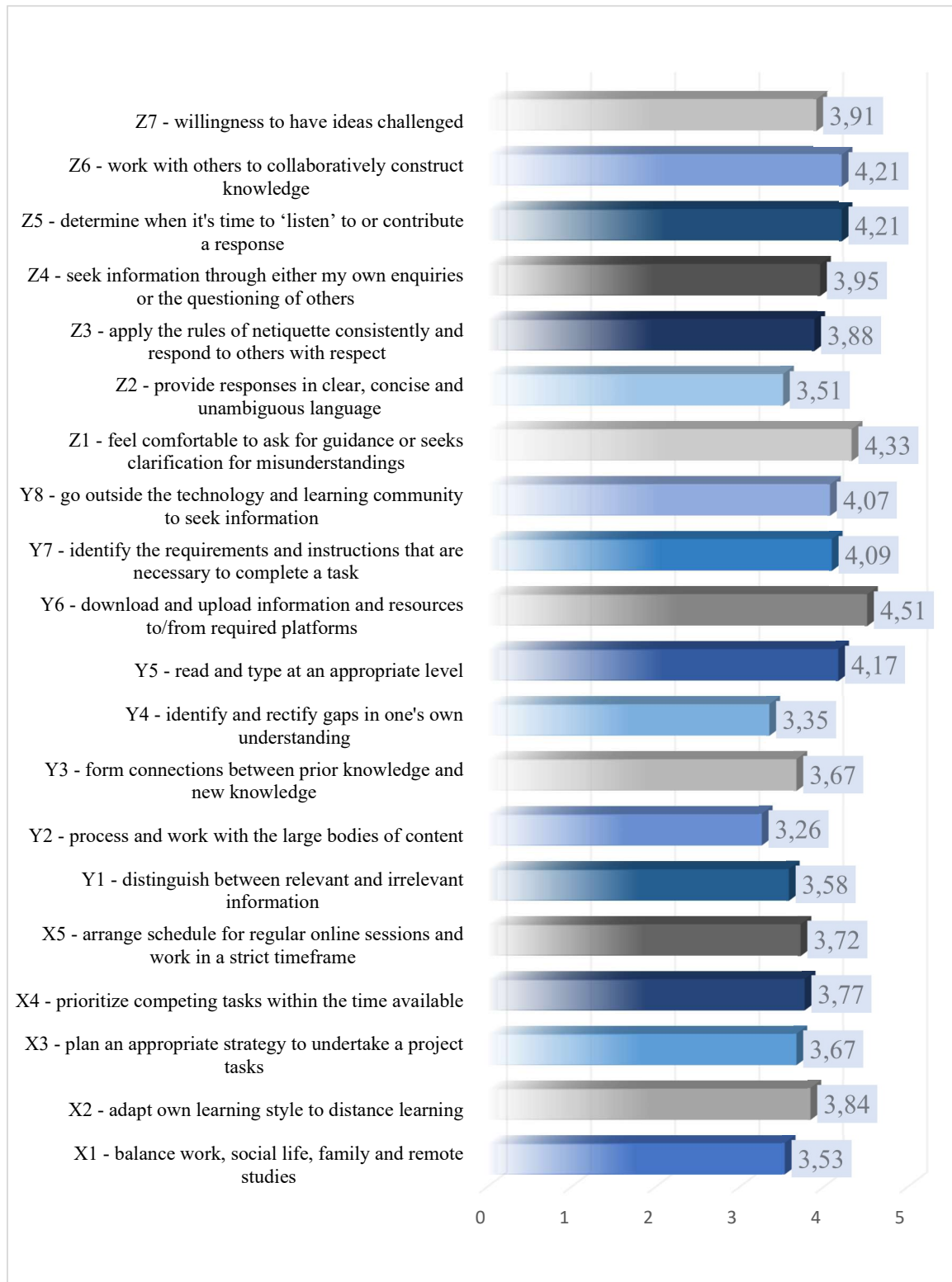


Figure 12

Mean scores of how teachers rated students' e-learning competencies



The findings refer to the most and least developed student e-learning competencies according to teaching staff. For instance, while the most highly rated competence was

“ability to download and upload information and resources to/from required platforms” with the mean score of 4,51; the least developed competencies were from the “interaction with e-learning content” dimension. Precisely, the ability to identify and rectify gaps in one's own understanding, and ability to process and work with the large bodies of content was considered the least developed among others. 7 out of 20 e-learning competencies were rated as highly developed (with more than 4,0 score) and 5 - comparatively underdeveloped. Both students and teachers think that management of the virtual learning process is the least developed dimension. While teachers worried more about the student preparedness level of “interaction with the content” dimension, students were positive about Y and Z dimensions.

Most of the teachers’ and students’ response mean scores were similar, but there were minor differences in some aspects. For that reason, it was decided to run independent samples t-test to examine the significance level between students’ and teachers’ responses.

Table 9

The significance of difference in students’ and teachers’ responses about preparedness for emergency remote education

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
X2	Equal variances assumed	15,835	,000	-,397	1435	,692	-,077
	Equal variances not assumed			-,570	47,819	,571	-,077
Z1	Equal variances assumed	21,092	,000	-2,843	1434	,005	-,581
	Equal variances not assumed			-4,281	48,455	,000	-,581
Z3	Equal variances assumed	8,409	,004	-,804	1432	,422	-,154
	Equal variances not assumed			-1,142	47,671	,259	-,154

Note. Significance level $\alpha = 0.05$

It was found that out of 20 e-learning competencies, only 3 were measured statistically significant, which means that for most of the competencies, both students and teachers have similar opinion. The competencies that were statistically significant are: adapt own learning style to distance learning (X2), feel comfortable to ask for guidance or seeks clarification for misunderstandings (Z1), apply the rules of netiquette consistently and respond to others with respect (Z3).

Apart from that, it was interesting to note that teachers considered all five competencies in “Management of learning process at the e-learning environment” dimension slightly higher than students themselves think. Also, in “Interaction with the learning content during distance learning” deminsion, for 6 out of 8 competencies, students' self-evaluations are higher than they were assessed by teachers. And both groups considered the third dimension about interaction with e-learning community, as the most developed one.

Figure 13

Comparison of teachers’ and students’ responses about “management of learning process at the e-learning environment” dimension

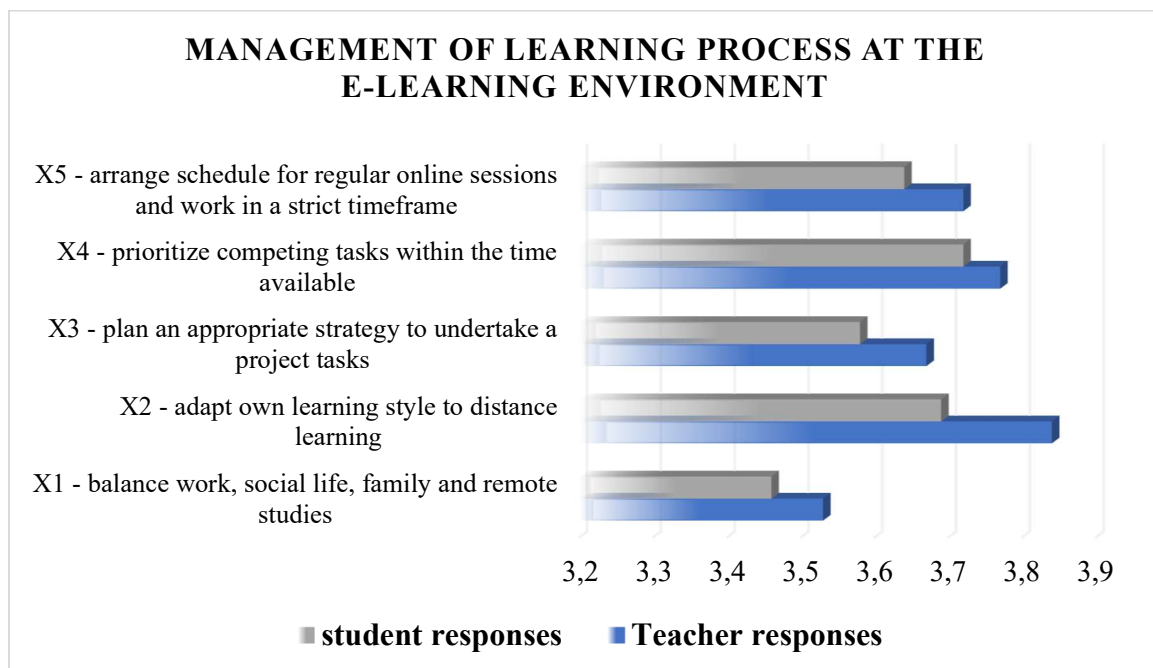


Figure 14

Comparison of teachers' and students' responses about "interaction with the learning content during distance learning" dimension

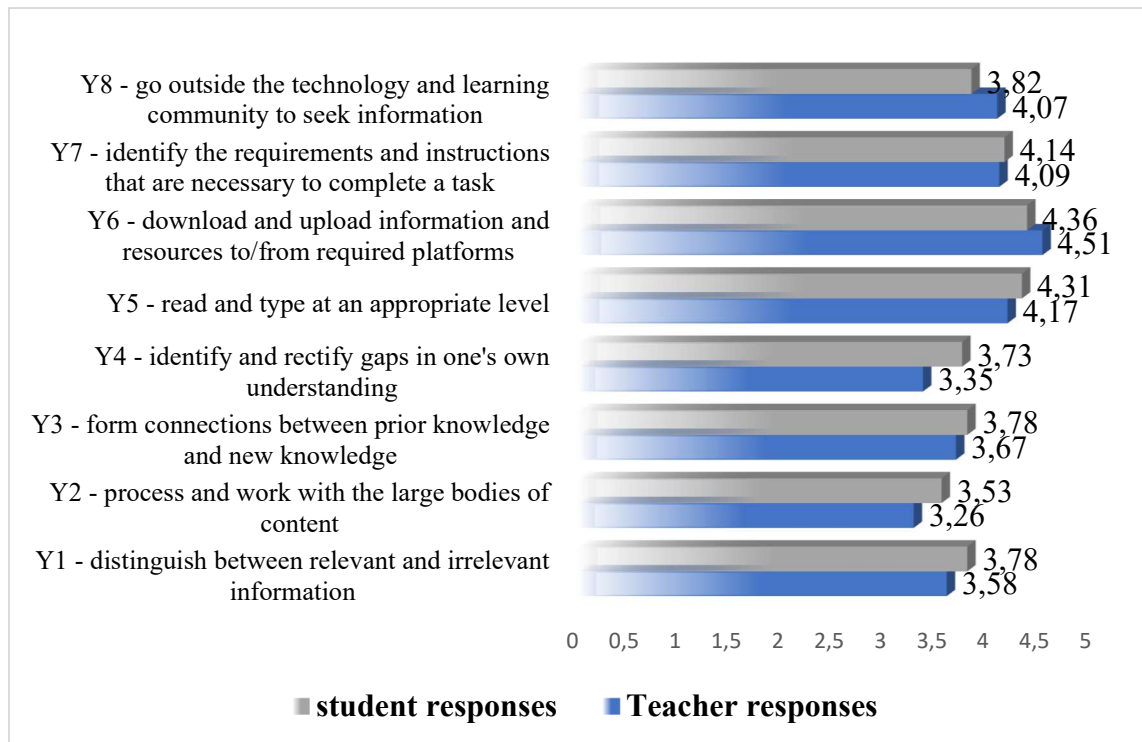


Figure 15

Comparison of teachers' and students' responses about "interaction with the e-learning community" dimension

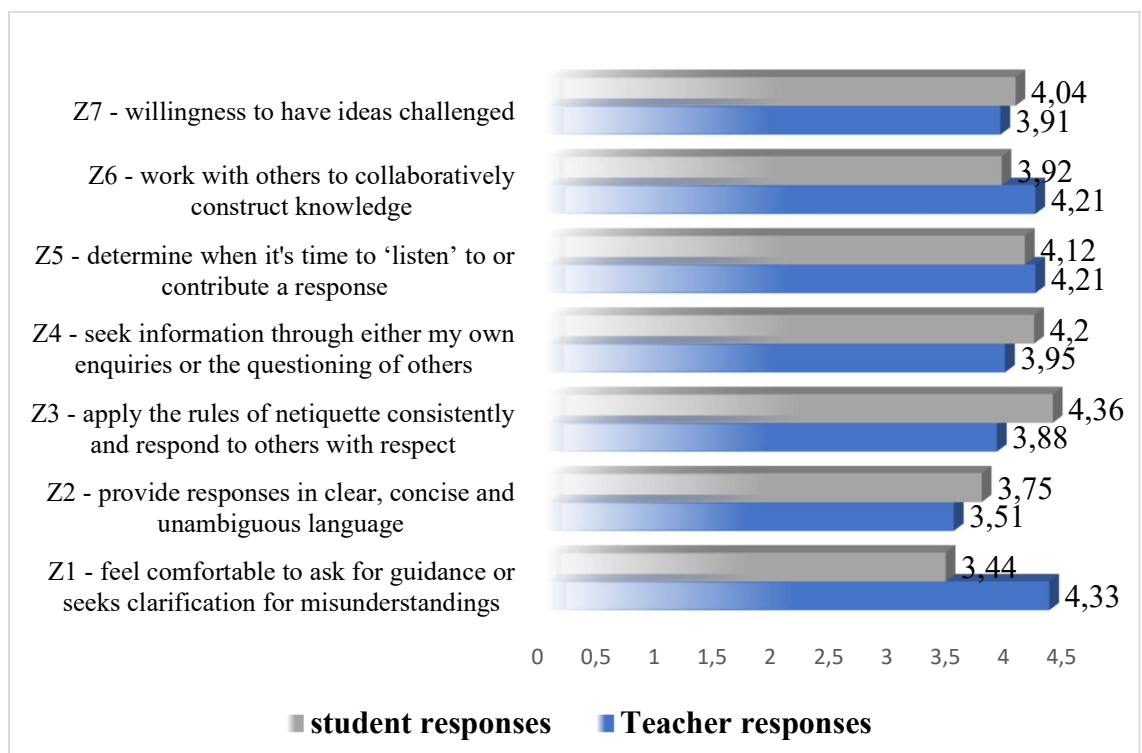
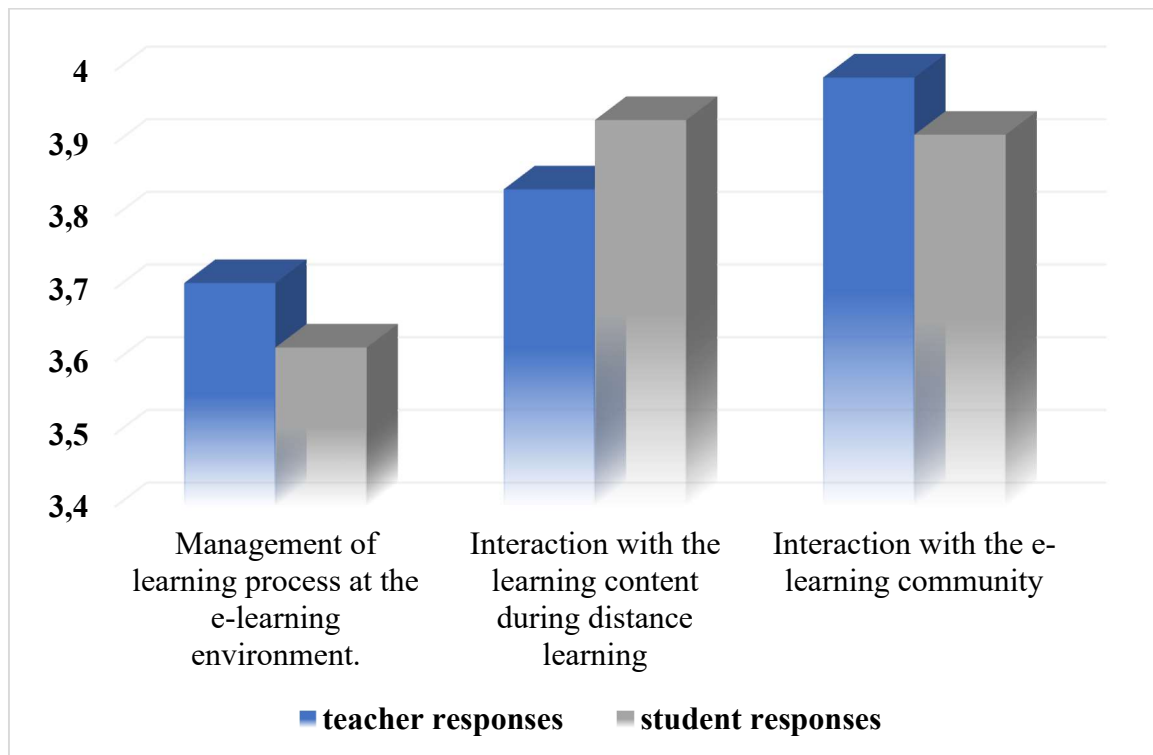


Figure 16

Comparison of teachers' and students' general means for three dimensions



RQ4: Is the relationship between e-learning competencies and students' academic performance significant?

Another important part of the study was about finding the relationship between e-learning competencies and academic performance. For that, in the survey students were asked to indicate their GPA ranges along with their scores for e-learning competencies. To find the relationship between e-learning competencies and academic performance, it was decided to use Spearman correlation. The null hypothesis for Spearman correlation is H_0 : there is no association between the high preparedness for compelled distance learning (e-learning competencies) and high GPA, and alternative hypothesis is H_1 : There is association between those two variables.

Since students indicated their GPA ranges, we had to convert them into numeric values. The reason for asking ranges and not exact GPA-s was that students could have mistakenly indicated their Grand GPA instead of GPA for the last semester. Following this

interpretation, we gave the lowest value to lowest GPA range and highest to top GPA range as it is shown in the table below.

Table 10

GPA and numeric values

GPA range students selected in the survey	Numeric value given
2.00 and lower - (C)	1
2.01 -2.33 - (+C)	2
2.34 - 2.67 - (-B)	3
2.68 - 3.00 - (B)	4
3.01 - 3.33 - (+B)	5
3.34 - 3.67 - (-A)	6
3.68 - 4.00 - (A)	7

Running Spearman correlation, it was found that there is a significant correlation between e-learning competencies and academic performance, which means that if learners are highly competent in e-learning, they tend to excel in the learning process. The correlation coefficient for the general mean of all students' e-learning competencies with GPA is 0,121 with a significance level <0,001.

Table 11

Correlation of GPA and e-learning competencies

		Spearman's rho		
		Correlation Coefficient	Sig. (2-tailed)	N
GPA	GPA	1,000	.	1396
	General mean of all dimensions	,121**	,000	1396
	Management of learning process at the e-learning environment	,113**	,000	1396
	Interaction with the learning content during distance learning	,108**	,000	1396

Interaction with the e-learning community	,111**	,000	1396
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Note. **. Correlation is significant at the 0.01 level (2-tailed).

RQ5: Is there a difference in the preparedness level of students of different genders, faculties, and years of study for emergency remote education?

The next research question implies to find the difference in preparedness level for emergency remote education among different groups of students. Precisely, male and female students, students from different faculties and years of study.

Genders

To find the difference in mean scores of each dimension and in general among male and female students, it was decided to use an independent samples t-test. The null hypothesis (H_0) and alternative hypothesis (H_1) for genders are as follows: $H_0: \mu_1 = \mu_2$ (the two-population means are equal); $H_1: \mu_1 \neq \mu_2$ (the two-population means are not equal).

Since the significance value (0,009) is less than 0,05, it was found that there is a statistically significant difference in preparedness level of males and females, so we can reject the null hypothesis, and conclude that the mean scores between male and female students are significantly different. Female students tend to measure their preparedness level higher than male students. The greater difference in preparedness could be noticed in the “Management of learning process at the e-learning environment” and “Interaction with the e-learning community” dimensions.

Table 12

Difference in preparedness for compelled distance learning among males and females

	gender	N	Mean	Std. Deviation	Std. Error Mean
ManageLearnEnv	1,00	855	3,6755	1,01330	,03465
	2,00	541	3,5278	1,10520	,04752
InterContent	1,00	855	3,9690	,78987	,02701
	2,00	541	3,8718	,91947	,03953
InterCommunity	1,00	855	3,9543	,86692	,02965

	2,00	541	3,8430	,98388	,04230
GenMEAN	1,00	855	3,8663	,76906	,02630
	2,00	541	3,7476	,90439	,03888

Note. 1,00 – female, 2,00 – male

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ManageLearnEnv	Equal variances assumed	8,437	,004	2,561	1394	,011	,14768	,05768	,03454	,26082
	Equal variances not assumed			2,511	1074,923	,012	,14768	,05881	,03228	,26307
InterContent	Equal variances assumed	15,861	<,001	2,100	1394	,036	,09720	,04628	,00641	,18798
	Equal variances not assumed			2,030	1021,242	,043	,09720	,04788	,00324	,19115
InterCommunity	Equal variances assumed	7,304	,007	2,216	1394	,027	,11126	,05021	,01276	,20976
	Equal variances not assumed			2,154	1041,881	,031	,11126	,05166	,00990	,21262
GenMEAN	Equal variances assumed	19,143	<,001	2,622	1394	,009	,11871	,04527	,02990	,20753
	Equal variances not assumed			2,529	1013,095	,012	,11871	,04694	,02660	,21083

Note. significance level $\alpha = 0.05$

Years of study

Next, we were interested in finding differences in the preparedness level of students from different years of study. After finding that the difference in preparedness level of male and female students is statistically significant, I proceeded to exploring differences in the preparedness level of students from different years of study. For this research, we had 4 groups of students: freshmen, sophomore, junior and senior. Analyzing demographic variables, it was found that freshmen and sophomore students constituted together more than 80% of respondents. To find the difference in preparedness level of students from different years of study, and to discover whether the difference is statistically significant, One-Way

ANOVA was used. The null hypothesis (H_0) for the ANOVA is that there is no statistically significant difference in preparedness for compelled distance learning among students from different years of study; and the alternative hypothesis (H_1) assumes that there is a statistically significant difference.

First, mean scores of each dimension was compared, and it was found that 3rd year students measured their preparedness for distance learning slightly lower than others. On the contrary, graduating students considered themselves the most prepared, comparing to other years, with the general mean of 3,95 out of 5. The sophomores and freshmen showed similar results of just above 3,8.

Table 13

Mean scores of students from different years of study about preparedness for compelled distance learning

Descriptives			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
						Lower Bound	
General mean score of all dimensions	1 year	837	3,8406	,75916	,02624	3,7891	
	2 year	317	3,8175	,94068	,05283	3,7136	
	3 year	175	3,6773	,86281	,06522	3,5486	
	4 year	67	3,9523	,91611	,11192	3,7289	
	Total	1396	3,8203	,82586	,02210	3,7769	

Table 13 demonstrates whether there is a statistically significant difference between 4 groups preparedness for emergency remote education.

Table 14

Output of ANOVA analysis

ANOVA		Sum of Squares	df	Mean Square	F	Sig
GenMEAN	Between Groups	5,093	3	1,698	2,497	,058
	Within Groups	946,361	1392	,680		
	Total	951,454	1395			

Note. significance level $\alpha = 0.05$

It can be seen that the significance value is 0,058 which is above 0,05, and, therefore we fail to reject the null hypothesis and conclude that there is no statistically significant difference in preparedness for emergency remote education between students from different years of study.

Faculties

Lastly, we were interested in finding out whether the preparedness level of students from different faculties varies, as they have dissimilar academic backgrounds and courses. Descriptive statistics were used to find the difference in general mean scores of dimensions in e-learning competencies, and One-Way ANOVA was applied to show to what extent the difference is statistically significant. Again, the null hypothesis (H_0) for the ANOVA is that there is no significant difference in preparedness for compelled distance learning among students from different faculties; and the alternative hypothesis (H_1) assumes that there is a significant difference.

The descriptive statistics show that students from business faculty generally consider themselves the least prepared for compulsory distance learning with the mean score 3,61, while their peers from education and humanities faculty measure their preparedness level for distance learning much better, with mean score of 3,95.

Table 15

Mean scores of students from different faculties about preparedness for compelled distance learning

Descriptives						
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound
General mean score of all 3 dimensions	Business	168	3,6110	,79226	,06186	3,4888
	Engineering	667	3,7915	,85898	,03367	3,7253
	Education	426	3,9532	,77768	,03827	3,8780
	Law	175	3,8093	,79418	,06127	3,6883
	Total	1396	3,8203	,82586	,02210	3,7769

Table 15 demonstrates whether there is a statistically significant difference between 4 groups preparedness for emergency remote education.

Table 16

Output of ANOVA analysis

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GenMEAN	Between Groups	15,045	3	5,015	7,455	,000
	Within Groups	936,409	1392	,673		
	Total	951,454	1395			

Note. significance level $\alpha = 0.05$

The significance value is 0,000 which is below 0,05, and, therefore we reject the null hypothesis and conclude that there is a statistically significant difference in preparedness for emergency remote education between students from different faculties.

As we know that the difference between 4 groups of students, as a whole, is statistically significant, we also interested in finding to what extent preparedness of students from different faculties differs from each other. The Multiple Comparisons table demonstrates that there is a statistically significant difference in preparedness level between most of the faculties. The table below shows that the value for education faculty students is positive, which means that they feel themselves more prepared for emergency remote education than business and engineering students, whereas business students are significantly behind all 3 faculties.

Table 17

Multiple comparisons between students from different faculties

Multiple Comparisons							
Dependent Variable	(I) faculty	(J) faculty	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
LSD							

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GenMEAN	Business	Engineering	-,18046*	,07166	,012	-,3210	-,0399
		Education	-,34224*	,07570	,000	-,4907	-,1937
		Law	-,19827*	,09003	,028	-,3749	-,0217
	Engineering	Business	,18046*	,07166	,012	,0399	,3210
		Education	-,16178*	,05160	,002	-,2630	-,0606
		Law	-,01782	,07098	,802	-,1570	,1214
	Education	Business	,34224*	,07570	,000	,1937	,4907
		Engineering	,16178*	,05160	,002	,0606	,2630
		Law	,14397	,07505	,055	-,0033	,2912
	Law	Business	,19827*	,09003	,028	,0217	,3749
		Engineering	,01782	,07098	,802	-,1214	,1570
		Education	-,14397	,07505	,055	-,2912	,0033

Note. * - The mean difference is significant at the 0,05 level. POSTHOC=LSD ALPHA (0,05)

Chapter 5: Discussions

In the previous chapter, the data analysis and findings of the mixed method study were presented, which were aimed at identifying students' most important e-learning competencies and measuring their preparedness for emergency remote education at one Kazakhstani private university. Along with that, the researcher tried to examine the relationship between e-learning competencies and academic performance. In this chapter, I will discuss and interpret the findings in relation to the literature in the field. There were five research questions to be answered in this study, and in the discussion part I will interpret results and provide answers to each question separately. The first research question is implied to identify the most essential e-learning competencies for the students of this particular private university. The second research question is aimed to measure students' preparedness for compelled distance learning, by allowing students to self-assess their e-learning skills. The third research question is aimed to find to what extent teaching staff members rate students' preparedness for compulsory online education. The fourth research question aspires to find out a relationship between e-learning competencies and students' academic performance (GPA). And the last research question is about finding differences in the preparedness level of students of different genders, faculties, and years of study for emergency remote education. To address these questions, a mixed method case study research with the holistic approach design was applied.

The chapter is organized in six sections. In the first section, findings related to the identification of students' e-learning competencies are discussed. Moreover, the various factors that influenced the selection of different e-learning competencies to the "List of most important e-learning competencies" will be examined and discussed. In the second section, students' preparedness for compulsory distance learning will be discussed and interpreted through the prism of more and less developed e-learning competencies; and possible causes

of well and poorly developed competencies will be identified. Since both students and instructors were asked to rate students' preparedness for emergency remote learning, in the third section, the difference between how students and teachers measured learners' preparedness will be discussed. Next, I will discuss the relationship between e-learning competencies and students' academic performance; and provide plausible explanations for the correlation of mentioned variables. Also, the differences in preparedness level among different groups of students will be discussed in detail. Lastly, I will summarize the key ideas presented in this chapter and introduce the final chapter of the thesis.

The most important e-learning competencies of students

Since the core idea of this study is to identify to what extent students are prepared for an urgent shift to online studies, an instrument to measure the preparedness level of students had to be found. It also develops the idea that if we find how to assess students' preparedness for emergency remote education, then we can also figure out their strengths and weaknesses in the issue of preparedness and help. So, the group of university stakeholders developed a list of e-learning competencies that are essential for remote studies. Each competency is a skill that plays an important role in one or another aspect of a student's online academic life. And if a student has these competencies highly developed, then it is much easier to study online, which will have a positive effect on academic performance too. So, the Social Constructivist approach used in this research resulted in accepted-by-all e-learning competencies.

Interestingly, in the developed list, only 4 competencies out of 22 were directly related to usage of online learning technologies, others were closer connected to management or adaptability to new realities. This contradicts the work of Parkes, Reading and Stein (2015), who claimed that inspection of e-learning competencies demonstrated that most of them are related to technologies. These differences can be explained by the context

of the study. In other words, while previous studies focused on distance learning, this work explores the issues of emergency distance learning. Urgent transition to online justifies the reason for adaptability, ability to control the environment, and self-management skills playing a more important role in context, than those skills that are directly related to technology.

Moving forward, it is worth saying that 3 dimensions for all e-learning competencies were developed. The first dimension included competencies related to the management of online learning processes; and consists of students' abilities to balance remote learning and other parts of life, adapt own learning style for distance learning, plan and prioritize time for given assignments, use the internet in a way that saves time and etc. It is important to note that usually students were interested in suggesting mentioned competencies during the discussion process. The importance of these competencies can be explained by the fact that students are likely to experience tremendous difficulty in managing time (Morris, Brooks & May, 2003) and, while studying at home, cannot separate the boundaries between study and other aspects of life. Moreover, during the abrupt transition to online mode, teachers loaded students with many tasks and assignments (Sanchez, 2020), because "anyway they are sitting at home, what else might they do". So, as a result, students emphasized the skills of time management and efficient distribution of tasks in a short time. The value of "management of the learning process in an e-learning environment" related competencies is stated in the work of Hung, Chou, Chen, and Own (2010) who called this group of skills as "learner control".

The second dimension is called "interaction with the learning content during distance learning", and consists of abilities to distinguish relevant information, work with large bodies of content, understand requirements for the tasks to complete, find connection between already learned content and new knowledge, and etc. While designing competencies

for this dimension, teachers and administration members were the most active participants of the discussion. They worried that students may not receive teacher support at an appropriate level, like in traditional lessons; so, it was important to include the skills about students' ability to work and operate with the content on their own. Also, digital competence related skills like fast typing, searching for information on the web are included, since the task format changed during distance learning.

Last dimension is called “interaction with an e-learning community” and emphasizes the skills of building relationships with other students during online learning. Online sessions sometimes cause troubles, as students and teachers say, because during live sessions students interrupt each other, and could not use communication tools appropriately. Also, those who were usually active on-campus, no longer confident in their responses and do not welcome challenging their ideas. Coherently, it is believed that staying connected with others during distance learning is beneficial for both students’ academic achievements and psychological aspects.

To conclude, university stakeholders developed a list of students’ e-learning competencies that covered versatile needs of students in terms of emergency remote learning. On the basis of these e-learning competencies, students' preparedness for compelled distance education was measured.

Preparedness of students for emergency remote education

As it was mentioned in the findings, students highly measure their preparedness level for compelled distance learning with the mean score 3,84 out of 5,0. It means that learners are not experiencing notable difficulties with remote studies. However, referring to the dimensions and individual e-learning competencies, interesting outcomes appear.

For instance, “management of e-learning process” dimension was found to be considerably less developed than the other two, which means that students are experiencing

some problems with taking under control multitasking, prioritizing and time management. This corresponds with the work of Morris, Brooks and May (2003) who came to the same results. Especially, students rated lowly the ability to balance social life, family with remote studies (3,46). One of the possible reasons is that parents do not recognize sitting in front of the computer as a part of the learning process and interrupt students by giving household tasks, and etc. This is also stated in the work of Margaryan, Littlejohn and Vojt (2011), who emphasized that there are differences in perception of learning between new generations and older people. Also, students reported all time-management related competencies equally challenging, which proves the consistency of poorly developed dimension in general. To improve these competencies, both parents and teachers have to provide support, empathy and realization of hardships students experience.

Comparatively, students rated their interaction with e-learning content and community dimensions higher (3,93 and 3,91). That can be explained by the fact that most of the competencies in these dimensions are intertwined with modern traditional classes and students have been honing these skills for a long time before pandemic. For example, teachers have practiced the usage of online platforms and web-based tasks in the on-campus educational process, so it was not something unexpected or new for learners, and results of the survey demonstrated a high level of preparedness. However, the notable exception was that, among all 22 competencies, the least developed competence was found in “interaction with e-learning community” dimension. It is about feeling insecure while asking for guidance or seeks clarification for misunderstandings (3,44). According to Smith (2005), many students think that working in front of the monitor leads to the loss of connection and asking for help while everyone is online and listening, is an embarrassing feeling. Also, the results lead to the observance that while students are good at communicating with each other, they still experience difficulties in working with each other. On the other hand, action-

oriented competencies, like fast typing or uploading and downloading resources from platforms, were predictably most highly rated. That is due to the reason that these are surface skills and are well mastered by almost every modern student.

To conclude, despite there were not any consistent patterns for poor levels of students' preparedness, many responses were lower in terms of activities like planning, balancing, time management, asking for support, and working with bigger tasks.

Differences between the students and teachers in evaluation the preparedness for emergency remote education

As it was mentioned in findings, general mean scores for students' preparedness for compelled distance learning were similar among the students' and teachers' responses. It shows that there is a tendency for teachers and students to be confident in students' preparedness level. Both teachers and students highly rate student's general preparedness, but there are several differences in details. Independent samples T-test showed that teachers and students rated statistically different only 3 competencies out of 20.

Firstly, it is worth mentioning that both groups of respondents consider management of the learning process in the e-learning environment lagging behind other 2 competencies. Teachers who have also faced problems with balancing work with lessons, family and time planning are likely aware of the potential student difficulties; and felt that the competencies of students in this area are poorly developed. It also may be because students asked for deadline extensions more often than during on-campus classes, as some teachers reported. Reflecting on this, the students said that they were not used to large bodies of assignments. Along with that, teachers and students agree that other two groups of competencies are more developed, but teachers were more critical in the aspect of students' interaction with learning content. This might be due to the teacher's nature, which is usually about setting high standards and requirements for own courses.

Moving forward, while teachers rated all management of learning process related competencies slightly higher than students did, an opposite picture is noticed in interaction with e-learning content. It can be interpreted that teachers have higher expectations from students about their preparedness in terms of being able to control the online learning process; and are critical about the interaction with the e-learning community competencies, where students highly rated their skills.

Next, while comparing students' and teachers' responses about individual e-learning competencies, most of them had similar rates, which means that students and teachers understand the state of affairs. However, several reverse findings were also established. For example, while students showed insecurity in asking for advice or clarification of misunderstandings, teachers singled out this students' competence as one of the most developed. This can be explained by the fact that, from the teachers' point of view, many students always ask questions during class, but from the students' responses it seems that in fact one student never asks for support twice. Similarly, the students highly rated their ability to apply the rules of netiquette, but the teachers disagreed, assessing the students' possession of this skill as comparatively lower.

Relationship between e-learning competencies and students' academic performance

From the results of Spearman correlation, it was found that there is significant association between e-learning competencies and students' academic performance with the 0,121-correlation coefficient. Basically, it means that if students are possessing a high level of e-learning competencies, it positively influences their GPA points. This makes sense as we have tried to list the most important competencies that have the potential impact to academic performance. Despite proven correlation of e-learning competencies with academic performance, it is important to take into account other factors such as having access to the resources, comfortable conditions for studying, laptop or tablet, good internet

connection (Gierdowski & Galanek, 2020; Dev, 2021; Tiwary, 2020; Prescott, 2020), that also important for success in remote learning.

The difference in preparedness for emergency remote education among students of different genders, years of study, and faculty

Using independent samples t-test and one-way ANOVA, it was found that there is a significant difference in preparedness level between males and female students. Along with that, it was concluded that there is no statistically significant difference between students from different years of study. And there is a statistically significant difference in preparedness level for compelled distance learning between students from different faculties. This section attempts to interpret and explain mentioned findings.

The results of the self-evaluating survey demonstrated that female students consider themselves significantly better prepared for emergency remote education, than male students do. Generally, their response rates were 0,1 points higher in all competencies. Similar comparisons were examined in the work of Atkinson and Blankenship (2009), however it was concluded that male students are significantly more comfortable in communicating online; which contradicts the results of this study. In our case female students felt more comfortable in the dimension of interacting with the e-learning community, than male students. The results can be interpreted taking into account the personal qualities and social customs in which girls feel closer to home, as well as spend relatively more time there. To support that, UNICEF (2016) estimates that, on average, girls spend time at home and do household duties there 40% more often than boys, which could play an important role in making girls feel more comfortable and prepared for the period when complete isolation was introduced and all students switched to distance learning.

Moving forward, it was found that generally there is no statistically significant difference in preparedness level between freshmen, sophomore, junior and senior students.

Actually, it was expected that senior year students would show better preparedness level, but it turned out that generally the differences were insignificant. However, third year students demonstrated that they experience considerably more difficulties with online courses than others. The feeling that juniors consider themselves less prepared can be explained by the fact that in the third-year students begin their most intense and challenging curriculum. On the other hand, as expected, graduates rated their level of readiness for distance learning higher than other students, which demonstrates that they are more experienced in using digital learning tools and feel more confident in self-directed study, as well as in building virtual communication with their peers.

Finally, students from different faculties were also compared on the issue of preparedness for compelled distance learning. One-way ANOVA confirmed the statistically significant differences among students from business, engineering, education and law faculties. Business faculty students rated themselves as the least prepared for distance learning, while education faculty students were the most confident. The possible reasons for the uncertainty of business students regarding readiness for compulsory distance learning is that it is likely that business school courses are very targeted at practice that has suffered a lot during online; and attempts to bring them all online, have made the subjects themselves difficult. Therefore, students reported a low level of preparedness. Another possible reason for the comparatively low preparedness level of business students is possibly self-criticism of their own skills. On the contrary, education faculty students reported themselves to be highly prepared for remote studies, which might be explained by the quick adaptability of their courses to online learning, as well as potential self-exaggeration of education faculty students. Along with this, written or narrative assignments usually dominate among students of pedagogical faculties, and the completing such assignments at home is comfortable, which may also be reflected in the level of preparedness. Predictably, engineering faculty students

measured their e-learning competencies moderately high, which is supported by the fact that their courses, even in on-campus mode, are associated with online technologies and digital platforms.

Conclusion

Overall this study identified the most important 22 e-learning competencies for students of one private university in Kazakhstan, and found that students generally well-prepared for compelled distance learning. Also, strong correlation between e-learning competencies and academic performance was defined, and differences among different groups of respondents were compared and reported.

Chapter 6: Conclusion

The previous chapter outlined and interpreted results, revealing that students are generally well-prepared for compelled distance learning. This chapter presents the final conclusions and summary of the study, as well as limitations, implications, and recommendations for future research. This mixed method study aimed at identifying students' e-learning competencies and measuring student preparedness for emergency remote education at one private university in Kazakhstan.

Summary of the study

There were five research questions, driving the study. They are:

1. What are the students' primary e-learning competencies required for effective performance during compelled distance learning?
2. To what extent students from one private university in Kazakhstan rate their preparedness for compelled distance learning?
3. To what extent does teaching staff from one private university rate students' preparedness for compelled distance learning?
4. Is the relationship between e-learning competencies and students' academic performance significant?
5. Is there a difference in the preparedness level of students of different genders, faculties, and years of study for emergency remote education?

A single case study with the holistic approach was selected as a particular research design in this work. Mixed methods implied focus group discussions with web-based surveys consequently. For the qualitative part, 10 university stakeholders were invited to participate; and quantitative web-based anonymous surveys covered 1436 students and 43 teachers. While qualitative data helped to identify the most important e-learning competencies for distance learning, the quantitative part of the study measured students' preparedness level

for emergency remote education and examined correlation between e-learning competencies and academic performance.

For the qualitative part, 10 university stakeholders were purposefully selected on the basis of having experience in distance education, and focus group discussions were organized. The data was collected and analyzed applying transcribing, coding and sorting codes into themes. The main findings of the qualitative part were that university stakeholders (students, teachers, administration) highlighted 3 dimensions of the most essential e-learning competencies and developed 22 student's must-have competencies for successful distance learning.

For the quantitative part, anonymous web-based surveys for students and teaching staff were sent with the aim of measuring student preparedness for compelled distance learning. While students measured their own e-learning competencies, teachers evaluated to what extent students are prepared for distance learning. Along with that, students indicated their demographic characteristics and GPA scores for the last semester, which helped to examine correlation of e-learning competencies with academic performance. Also, comparison in preparedness for compelled distance learning between different groups of students were also performed.

The main findings of the quantitative part of this research were compiled into four themes: preparedness level of students for emergency remote education, difference between the students and teachers in evaluation the preparedness for emergency remote education, relationship between e-learning competencies and academic performance, difference in preparedness for emergency remote education among students of different genders, years of study, and faculty.

Overall, study showed that students of one private university in Kazakhstan are well-prepared for emergency remote learning. The least developed dimension was management

of the online learning process, and both students and teachers highlighted difficulties related to balancing work, social life, family and remote studies. Furthermore, students reported all time-management related competencies equally challenging. Also, it was found that the most developed competencies were connected to action-orientedness. Precisely, fast typing or uploading and downloading resources from platforms, were predictably most highly rated. Interestingly, it was noticed that interaction with the e-learning community appears to be challenging for many students, as they did not feel comfortable to ask for guidance or seek clarification for misunderstandings in online classes. Along with that, it was found that there is a significant correlation between e-learning competencies and academic performance, which means that students who possess well-developed e-learning skills tend to have higher GPA results during online semester. Connectedly, significant differences in preparedness for distance learning were found between males and female students, where females indicated their competencies comparatively higher than males. Also, there was no statistically significant difference in preparedness level of students from different years of study. On the contrary, it was revealed that faculty where students study affects their preparedness level for distance learning. While education and engineering students feel comfortable with the compelled remote studies, business students expressed lower levels of preparedness comparing to others.

Limitations of the study

Among the limitations of this study, the data collection period is particularly noteworthy. Despite the fact that the topic implies the preparedness of the students during the emergency transition to distance learning, the data was collected when the students had already studied online for one semester. Therefore, the data may be slightly distorted since in one semester, students could develop some skills for online lessons. Ideally, the data

should have been collected during the Spring-2020 or before the Fall-2020 academic semester.

Another limitation of this work is in the stage of collecting qualitative data. In the process of group discussions, I was forced to provide the participants with an approximate list of e-learning competencies, so that they could understand what e-learning competencies look like and what the outcome of the discussion should be at the end. The lists which I provided may have influenced the way university stakeholders collectively brainstormed, and some e-competencies might have been taken directly from there. However, it should be noted that participants did a great deal of work in identifying the most required e-learning competencies for the students of the particular university.

Implications and recommendations

The study about student preparedness for an emergency remote education can be used as a guide by other educational institutions in implementing and eliminating issues associated with online mode. Potentially, outcomes of this research may benefit educational institution's distance learning strategies and future plans, by delivering the data which might support the efficiency of remote classes by providing the status of student preparedness for distance learning. Furthermore, the identified data can be applied by relevant authorities to develop the local distance education and become a tool for university administration and teaching staff for meeting the distance education standards and how students need to be prepared for them, as well as what to stress attention on. Along with that, if the impact of e-learning competencies on the academic performance of students was, so the issue of honing these competencies directly during the classes might be considered. Accurately, this study points out students' skills and competencies related to distance learning that are in need of improvement. Thus, the results might also help in consolidating training for learners prior to the beginning of the academic year. Finally, university may take into consideration this work

while preparing students for future online experiences and advancing satisfaction with a distance learning environment.

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Appendices

Appendix A: Informed consent form

Informed Consent Form

Title of the research: Emergency Remote Education at Kazakhstani Private University: Identifying e-learning competencies and measuring student preparedness for compelled distance learning.

Researcher: Almaz Zhumageldi, Nazarbayev University, second-year student of the Graduate School of Education

Purpose of the study: The purpose of this study is to identify students' corresponding distance learning competencies and investigate their preparedness level for emergency remote education.

Procedures to be followed: You will be asked to provide answers to the online questionnaire by following the link that you will receive by email.

Duration: The completion of the questionnaire might take from 10 to 20 minutes.

Possible Risks: The possible risks or discomforts of the study are minimal. Potential risks of the study are related to your confidentiality, as sending direct messages to your corporate emails may cause to some **risks** as the data might be compromised by the corporate email administrators.

Possible Benefits: There are no direct benefits to you for participating in the study. However, this study can shed **the** light on the problems associated with the students' preparedness for compelled transition to **online** education in the context of Kazakhstani higher education, and be used as a guide by other **educational** institutions in implementing and eliminating issues associated with online. In addition, the results of this study could fill a gap in the existing literature, as there is a lack of scientific work in the unprecedented period of the worldwide COVID-19 pandemic, and the findings can be used by relevant authorities to develop local online education.

Statement of Confidentiality: The study will guarantee anonymity of the identities and responses throughout the research procedure. In order to do this, all the direct identifiers will be replaced or encoded. Throughout the thesis writing process, electronic data will be stored in the researcher's laptop and in Google Drive where they are protected by password. Furthermore, data will be kept private with shared access only to the thesis supervisor. The data will be destroyed approximately four months after thesis submission, defense and publishing the findings in an academic journal.

Right to Ask Questions:

You can contact the researcher via email at almaz.zhumageldi@nu.edu.kz with any questions or concerns that might arise regarding this research.

Voluntary participation: The decision to participate in this study is up to you. You do not have to participate and you can refuse to answer any question at any time without giving explanation. Even if you begin the study, you may withdraw at any time by e-mailing the researcher. Your withdrawal of participation in the study will not involve any harm or loss of benefits.

Contact details: Researcher Almaz Zhumageldi - almaz.zhumageldi@nu.edu.kz
Supervisor Mehmet Karakus - mehmet.karakus@nu.edu.kz

You must be 18 years old or older in order to be able to participate in the current study.

You will not be paid for your participation in this study. Additionally, you will not incur any costs for participating.

You may keep this form for yourself.

Thank you.

Appendix B: Email Letter for Participants Recruitment

Dear Sir or Madam,

My name is [Almaz Zhumageldi](#), and I am a second-year student at Nazarbayev University Graduate School of Education (MSc in Educational Leadership program).

I am writing to you to request your participation in a brief online survey about measuring student preparedness for compelled distance learning at your university. Your response to this survey will help me to identify students' corresponding distance learning competencies and investigate their preparedness level for emergency remote education.

The survey is very brief and will only take about 5 to 10 minutes to complete. Please click the link below to go to the survey:
https://docs.google.com/forms/d/e/1FAIpQLScmiw32ALX2oMIHQpGmMtZsHxYgS2Ny0T6TsUofofXzJJV6Rw/viewform?usp=sf_link

Your participation in the survey is completely voluntary and all of your responses will be kept confidential. You do not have to participate and you can refuse to answer any question at any time without giving an explanation. Even if you begin the survey, you may withdraw at any time. Your withdrawal of participation will not involve any harm or loss of benefits. Additionally, an informed consent form is attached below with a detailed description of the study.

The informed consent form is in the attachments.

Thank you very much for your time and cooperation,

Sincerely,

[Almaz Zhumageldi](#)