Understanding Kazakhstani Students' Willingness to Communicate in English in Senior Secondary STEM Subjects

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Submitted in partial fulfillment of the requirements for the degree of

Master of Arts

In

Multilingual Education

Nazarbayev University Graduate School of Education

June, 2020

Word count: 23,132

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October 2019

Dear Akmaral Keniskhanova,

This letter now confirms that your research project entitled: **"Understanding Kazakhstani Students' Willingness to Communication in English in Secondary STEM Subjects"** has been approved by the Graduate School of Education Ethics Committee of Nazarbayev University.

You may proceed with contacting your preferred research site and commencing your participant recruitment strategy.

Yours sincerely

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Acknowledgement

I would like to thank all people who contributed to my thesis writing and supported throughout this journey. I would like to express my sincere gratitude to my thesis supervisor, Dr. Anas Hajar, for the continuous support of my study by providing constructive feedback and guiding during whole thesis writing period and Professor Ali Ait Si Mhamed for valuable help in the analysis of quantitative data. Professor Miriam Sciala is another person I am also grateful for her considerable input in reviewing and improving my writing

I would also like to acknowledge all the professors of the Nazarbayev University Graduate School of Education who contributed to a valuable experience I received here by engaging me in new knowledge.

Lastly, I must express my very profound gratitude to my parents, friends and relatives for the unceasing encouragement and support throughout two years of study and through the process of researching and writing this thesis.

Understanding Kazakhstani Students' Willingness to Communicate in English in Senior Secondary STEM Subjects

Abstract

Reticence among Asian EFL/ESL learners was a concern for many researchers even before Willingness to Communicate (WTC) was introduced as a construct in Second Language Acquisition. Later, empirical studies on WTC in the second language (L2) in Asian EFL contexts have been progressively conducted, particularly in Japan (Yashima, 2002, 2018) and China (Peng and Woodrow, 2010). Yet a great deal more research on WTC remains to be done. The present study differs from prior studies by examining a group of senior secondary school students' WTC in English in STEM (i.e. Science, Technology, Engineering and Mathematics) subjects in Kazakhstan. Kazakhstan pursues a trilingual educational policy that indicates a percentage of citizens who speak Kazakh as the national language, Russian as the language of interethnic communication, and English as the language of successful integration in the global economy. Hence, English as a third language (L3) is used as a medium of instruction in STEM subjects in secondary schools. The present study adopted a mixed-methods approach to uncover the level of participants' L3 WTC and the factors that either boost or deter their oral interaction in English in STEM classes. The data were collected from a close-ended questionnaire completed by 170 students, followed by a semi-structured interview with 10 students. The findings indicated that the students' level of L3 WTC in STEM subjects was below average. Guided by Dörnyei's (2009) language motivational self-system, the qualitative data exploring the factors underlying students' L3 WTC in STEM subjects reported the influences of students' future-oriented self-guides in L3 (Ideal L3 self, Ought-to L3 self) and their L3 learning experience as being

dependent on their self-confidence in L3.This study concludes by stressing the importance of enhancing teachers and policy makers' awareness in multilingual societies (particularly in Kazakhstan) to different situational factors that may affect STEM students' WTC in English, and strategies that can be adopted in this regard.

Қазақстандық оқушылардың STEM пәндері сабақтарындағы

ағылшын тілінде сөйлеу дайындығын зерттеу

Аңдатпа

Сөйлеу дайындығы (СД) екінші тілді меңгеру теориясының құрамындағы түсінік ретінде ұсынылғанынан бұрын, ағылшын тілін екінші тіл (АЕТ) ретінде меңгеретін азиялық оқушылар арасында сөйлеу белсенділігі көбінесе төмен болу құбылысы көптеген зерттеушілерді алаңдатып келеді. Кейінірек, Азияның АЕТ ретінде үйренушілердің контекстінде, әсіресе Жапонияда (Яшима, 2002, 2018) және Қытайда (Пенг және Вудроу, 2010),екінші тілде (Т2) сөйлеу дайындығының эмпирикалық зерттеулері біртіндеп жүргізіле бастады. Дегенмен, СД туралы әлі де көп зерттеу жүргізу қажет. Бұл зерттеу алдыңғы зерттеулерден Қазақстандағы орта мектеп оқушыларының STEM (яғни, жаратылыстану-математикалық бағыттағы) пәндерінде ағылшын тілінде сөйлесу дайындығын зерттеуімен ерекшеленеді. Қазақстанда үш тілде білім беру саясаты жүргізілуде.Осыған сәйкес, қазақ тілі мемлекеттік тіл ретінде, орыс тілі ұлтаралық қатынас тілі ретінде, және ағылшын тілі әлемдік экономикаға сәтті интеграциялау тілі ретінде қарастырылған. Демек, ағылшын тілі үшінші тіл ретінде (Т3) орта мектептерде STEM пәндерін оқыту тілі ретінде қолданылады. Бұл зерттеу қатысушылардың Т3 сөйлеу дайындығының деңгейін және STEM сабақтарында ағылшын тілінде ауызша әрекеттесуге оң немесе кері әсеретін факторларды анықтау үшін аралас зерттеу әдісіне сүйенеді. Деректер 170 оқушы толтырған жабық сауалнамалардан жиналды, одан кейін 10 оқушыдан жартылай құрылымдалған бетпе-бет сұхбат алынды. Зерттеу нәтижелері оқушылардың STEM пәндеріндегі Т3 сөйлеу дайындығы орташа деңгейден төмен екенін

көрсетті. Дөрнейдің (2009) тілдік мотивацияның өзіндік жүйесін басшылыққа ала отырып, STEM оқушылардың Т3 сөйлеу дайындығы негізін құрайтын факторларды қарастыратын сапалық мәліметтерге сәйкес, оқушылардың Т3-ті меңгерудің болашақ көрінісі (Т3-тіміңсіз және тиісті менгеруінің көрінісі) және Т3-ті оқу тәжірибесі олардың өздерінің сенімділіктеріне тәуелді екенін көрсетті. Бұл зерттеу STEM оқушылардың ағылшын тілінде сөйлеу дайындығына әсер ететін түрлі жағдаят факторлары және оларға байланысты тиісті шаралардың қолданылу мүмкіндігі туралы көптілді білім беру саласындағы мұғалімдер мен саясаткерлердің (әсіресе Қазақстанда) аталған мәселе жайында хабардарлығын арттыру маңыздылығына көңіл аударады.

Понимание готовности казахстанских учащихся старших классовобщаться на английском языке на уроках STEM предметов

Аннотация

Молчаливость среди азиатских учащихся обучающихся «английскому языку как иностранному» (АЯИ) интересовала многих исследователей еще до того, как концепт «Готовности Говорить» (ГГ) был введен в сфере исследований «Обучения Второму Языку». Позже эмпирические исследования по ГГ на втором языке (Я2) начали прогрессивно проводиться в азиатских контекстах изучающих АЯИ, особенно в Японии (Яшима, 2002, 2018) и Китае (Пенг и Вудроу, 2010). Тем не менее, предстоит провести еще много исследований в сфере ГГ. Данное исследование отличается от предыдущих тем, что исследует готовность Казахстанских учащихся старших классов средней школы говорить на английском языке на STEM предметах (т. е. предметах естественно-математического направления). В Казахстане проводится трехъязычная политика образования, в которой указывается доля граждан, говорящих на казахском языке в качестве родного/национального языка, на русском в качестве языка межнационального общения и на английском в качестве языка для успешной интеграции в мировую экономику. Следовательно, английский как третий язык (Я3) используется как язык преподавания и обучения по STEM предметам в средних школах. В данном исследовании был применен смешанный метод, позволяющий выявить уровень готовности учащихся говорить на Я3 и факторы, которые либо способствуют, либо препятствуют их устному взаимодействию на английском языке на уроках STEM. Данные были собраны посредством анкетирования с закрытыми вопросами, заполненными 170 учащимися, с последующим индивидуальным

полуструктурированным интервью с 10 учащимися. Результаты показали, что уровень готовности учащихся говорить на Я3 на предметах STEM был ниже среднего. Руководствуясь языковой мотивационной самосистемой Дорнея (2009), качественные данные, изучающие факторы, лежащие в основе готовности учащихся говорить на Я3 на предметах STEM, сообщают о влиянии собственных представлениях учащихся о владении Я3 ориентированных на будущее (т.е. их представления идеального и должного владения Я3) и их опыта обучения Я3, который зависит от их самоуверенности при использовании Я3. Это исследование завершается подчеркиванием важности повышения осведомленности учителей и политиков в многоязычных обществах (особенно в Казахстане) о различных ситуационных факторах, которые могут повлиять на готовность учащихся говорить на английском языке на STEM предметах, и о стратегиях, которые могут быть приняты в этом отношении.

Table of contents

List of tables

List of figures

Chapter 1: Introduction

Raising people's competence in Kazakh, Russian and English has become one of the long-term priorities in Kazakhstan (Nazarbayev, 2012). Pursuant to the State Program for the development and functioning of languages in the Republic of Kazakhstan for 2011-2020 (Ministry of Education and Science (MoES), 2011), the Kazakh language is supposed to be spoken by all Kazakhstani people, while Russian and English by 90% and 20% of the whole population correspondingly by year of 2020. Hence, trilingual education commenced to be embedded across various educational settings all over the country. Special attention was dedicated to the introduction of the trilingual education program in schools, as they are known to be a fundamental stage in the education system. In order to gradually integrate trilingual education in Kazakhstan, as pinpointed in State Program of Development of Education and Science (SPDES) for 2015-2020 (MoES,2015), the programs would be piloted in Nazarbayev Intellectual Schools (NIS), Bilim-Innovation Lyceums (BIL) and 33 piloting schools before its actual implementation in mainstream schools in 2019 (Irsaliyev et al., 2017). Moreover, there is a remark in a diagnostic report for 2015- 2020 that NIS have already started cooperating with 35 schools for sharing own experience (Nazarbayev University Graduate School of Education, 2014). This specific measure indicates an implementation of trilingualism in Kazakhstan and even the beginning of application of trilingual educational approaches in teaching process in certain schools.

In response to the adoption of trilingual educational policy in Kazakhstan in 2016, school subjects were separated in relation to the language of instruction (LOI). That is, History, Geography, the Kazakh language and Literature are taught through Kazakh; World History through Russian; and STEM (i.e. Science, Technology, Engineering, and Mathematics) subjects through English (Ayazbayeva, 2017). It should be mentioned here that

among a wide range of subjects, STEM subjects which demand a high level of comprehension and analysis are taught in English which is neither mother tongue, nor local for Kazakhstani students. Although English is regarded as a foreign language (FL) in Kazakhstan, there are three reasons that explain why English has become vital in Kazakhstan and used as a medium of instruction in STEM subjects in secondary schools. The first pertains to globalization which necessitates mastering English in order to establish constructive relationships with other countries around the world (Gerfanova, 2018). The second reason is the possibility to integrate in the international educational system, which, in turn, as mentioned in 79th step of the National Plan in 2015, "increase(s) competitiveness of students when they leave and position(s) the educational sector as attractive for international students" (Consulate General of the Republic of Kazakhstan in Sydney Official site, 2015). The last one is in line with the recommendations of former president N. Nazarbayev who stated in one of his speeches: "we need the English language to enter the global arena; out of 10 million books published in the world 85% are in English; the science, all the new developments and information - they are all in English nowadays" (Zhumzhumina, 2013, para.5).Thus, it is expected that teaching STEM subjects through English "will promote obtaining new knowledge in original language and to entry into the world scientific community" (Erbolovna, Kokenovna, Adilkylovna, & Sarsenbaevna, 2019, p. 79). With the above in mind, it can conclude that the introduction of English medium of instruction in STEM classes in Kazakhstan is proceeding from the intention to meet the world standards of policy, economy, education and science.

These distributions of LOI in Kazakhstani schools complicate the learning process for students as they need both to acquire the content of STEM subjects and study an additional language (Ayazbayeva, 2017). As these alterations in Kazakhstani education policy are relatively new, there is still a dearth of empirical research investigating the effect on these changes on the learning process. Some studies (Baidaulet et al., 2019; Kaliakbarova &

Demeuova, 2019; Karabay A., 2017) examined Kazakhstani secondary school students' challenges while studying through the medium of English in schools. However, to the best of knowledge, no prior research has been conducted so far to understand secondary students' willingness to communicate in English in STEM classes, together with the variables that can affect this matter. In this sense, the present study reported in this thesis aims to address this research gap.

Problem Statement

The introduction of trilingual education implies distinct changes in both teaching and learning from linguistic perspectives. Especially the subjects with English medium of instruction are linguistically challenging as LOI in those subjects is completely different from previous years of schooling in Kazakhstan. Consequently, some recent published studies (Baidaulet et al., 2019; Irsaliyev et al., 2017) uncovered a number of linguistic challenges that many teachers and students of STEM in Kazakhstan are encountering. Irsaliyev et al. (2017), for instance, undertook a large-scale study in Kazakhstan involving the teachers of 35 urban, rural and ungraded schools and the students of STEM subjects of 17 teacher training universities. They aimed to explore whether Kazakhstani schools and universities are ready to switch to trilingual form of teaching. The findings of this study showed that the actual level of majority in-service teachers and university students preparing for teaching career was at A1-A2 and this is insufficient for teaching. The same study also found that teachers believed that the quality of teaching STEM subjects in English could be declined because of the students' low language proficiency as the students' engagement in a language atmosphere in classes of English occurred only twice a week. Irsaliyev et al.'s (2017) study investigating Kazakhstani situation for 2016 in terms of preparedness to alterations showed that both teachers and students were not ready to switch to English as LOI in STEM subjects. Later, Baidaulet et

al.'s (2019) study particularly examined the challenges that Kazakhstani senior school students' encountered during the training of biology in English. This study unveiled such obstacles as lack of adapted sources or books for teaching, and teachers' difficulty in the application of additional resources while attempting to deliver certain information in comprehensible way for their students, in addition to students' lack of engagement during the lesson attributable to their preparation to final examinations after the school graduation. The above explained studies (i.e. Baidaulet et al., 2019; Irsaliyev et al., 2017) provided insightful information about the challenges of the implementation of English as a medium of instruction in STEM subjects in Kazakhstan from the perspectives of both teachers and to less extent students. However, these studies did not explore the factors that can affect students' desire to interact in English in STEM classes. It is considered that the investigation of this issue is necessary in Kazakhstani context as its findings could assist in presenting better solutions in embedding STEM education. Thus, the current study is aimed to fill this lacuna, by using a mixed-methods approach to explore students' level of Willingness To Communicate (WTC) in STEM classes, together with the factors that affect their participation inside the classroom, including teachers' practices and students' self-confidence.

Research Purpose and Research Questions

The current study adopts a mixed-methods approach to explore the level of Kazakhstani students' WTC in English in senior secondary STEM subjects. The essential factors that affect their WTC in English will be also investigated. The investigation of the current situation also might help to identify areas where more attention and support should be provided to students to encourage communication in English in STEM classes. Moreover, this research can give significant insights to teachers and policymakers in Kazakhstan. In addressing this issue, the following research questions need to be answered:

1. What is the level of participants' WTC in English in Senior Secondary STEM Subjects?
2. What influences these participants' WTC in English?

Significance of the study

The significance of the present research is threefold. First, it considers *the importance of students' voices*. The academic experiences of young children and teens from their perspectives have not been sufficiently considered in previous research. This view, as Kanyal and Cooper (2012) note, might be ascribed to the lack of adults' confidence and determination to share their own authority with young children and teens. Such resistance often creates barriers in developing children's participative capacity and agency. Further, this leads to the emergence of challenges like students' low achievement rate, resistance to learning and non-engagement which increased a significance of conducting investigations on the students' voices (Sahin & Top, 2015). Laux (2018) presented in-depth understanding of an impact of the students' voices in the science education through the analysis of numerous studies in the field. Structuring all findings, Laux (2018) designed two theoretical understandings of students' voices in science classroom illustrating the empowerment of students by providing them an opportunity to propose classroom decisions. Turning to the present research, mainstream secondary students are recognized as active social agents who are resourceful and knowledgeable, especially concerning their own experiences with learning STEM subjects in English. In another vein, students' perspectives and experiences are researched directly and at first-hand in the present study. One of the central purposes of this study is to capture students' 'voices', by that, make some effort to increase an understanding of how the students in this research react to the educational change, how they adapt to them, how they overcome the challenges and what affects that. It is considered that awareness of

these issues could bring benefit to various stakeholders like policy–makers, STEM teachers, parents and students and, overall, the whole community as the students are our next generation.

Second, this study could provide some insights into *understanding the special features of STEM-education, particularly, in Kazakhstani context.* It is known that in international practice, there are different ways of integration of STEM subjects to education. One of them goes through all stages starting from a preschool level up to the post-doctorate, while others apply STEM subjects at the K-12 level (only school stage) (Granovskiy, 2018). Yet, in Kazakhstan the integration of STEM-education in Kazakhstan is different, as it relates to the practices of teaching of four science subjects (Information and Communications Technology (ICT), Physics, Chemistry, and Biology) in English only at senior classes (MoES, 2014). It is also mentioned in Strategic plan of the Ministry of Education and Science of Kazakhstan for 2017-2021 that starting from 2019-2020 two subjects out of four are planning to be taught in English depending the choice and opportunities of school (MoES, 2016). As a language for instruction in STEM classes in Kazakhstan is not the second one as researched earlier in other contexts, but a third language, and what is more, all those three languages in Kazakhstan relate to different language families (Turkic (Kazakh), Slavic (Russian), Germanic (English)). Therefore, this study mostly will focus on students studying English as a Foreign Language (EFL) or English learners. Being focused on Kazakhstani context, this study could be beneficial for policymakers as it helps to descry the challenges that Kazakhstani students face in science classes which should be analyzed and even envisaged in the educational programs

Third, this study provides *communicative perspectives in studying STEM issues*. Prior research on STEM education indicate that the alteration of LOI implies the changes

starting from new terminology (Jourdain & Sharma, 2016; Fatmanissa & Kusnandi, 2017; Secada, Medina & Avalos, 2018) to the communication level (Moschkovich, 2018; Haas, Grapin& Lee, 2018). Moschkovich's (2018) research signified the importance of redounding communication in FL among students in the classroom for building conceptual understanding of a learning topic. Moschkovich (2008) states that facilitating different kinds of discussion in a daily basis in the classroom supports learners of a FL to interact with each other and, by that, improving their language skills and acquiring the subject with deeper understanding. In light of these issues, it becomes a reasonable issue to research also the students' view on in-class communication in FL. In addition, the current study examining the students' WTC in English as L3 unlike most of previous studies where English came as L1 or L2 could extend our understanding of the interaction in science classroom. Therefore, considering all above-mentioned, not only the exploration of the level of the students' desire to participate in different forms of in-class L3 interactions can be considered as a significant feature of the current study, but also its focus on the comprehension of what encourages or discourages students to communicate in science classes. Thus, findings of this research it expected to be beneficial for Kazakhstani STEM-teachers as it provides deep understanding of the factors inhibiting or facilitating the learning process in science subjects in L3.

Outline of this thesis

After the detailed portrayal of the background, research problem, purpose and questions, and significance of the study in Chapter 1, I review the literature on the concepts of WTC in both L1 and L2 and the empirical investigations on variables of in-class L2 WTC in Asian context in Chapter 2. Moreover, Chapter 2 also elaborates on Dornyei's (2009) "L2 Motivational Self System" theory as a framework, Khatib and Nourzadeh's (2015)

"Instructional Willingness To Communicate questionnaire" as a tool for assessing in-class WTC, and research gaps in the investigation of WTC. It is pursued by the detailed explanation of how a mixed-methods study utilizing both semi-structured interviews and questionnaires assist in achieving the research purpose in Chapter 3. This chapter also provides information on the research site and sampling, approach for data analysis and ethical issues. Next chapter presents the analysis of the findings in pursuant to the two research questions. Chapter 5 discloses the discussion of findings in accordance with the framework and previous empirical data. The last chapter summarizes the results of the study by providing responses to research questions, and indicating the implications and limitations of the research.

Chapter 2: Literature Review

This chapter aims to review and critically analyze the literature pertaining to the construct of willingness to communicate (WTC) in language learning. This chapter is divided into four parts. The first identifies the origin of the WTC concept and its development in the first language (henceforth L1). The next part sheds light on the conceptualization of WTC in a second/foreign language (henceforth L2), explaining relevant previous empirical studies. The third part presents Dörnyei's (2009) 'L2 Motivational Self System' model applied in this study, before presenting the main instruments employed to measure in-class WTC. The last part of the chapter explains the research gaps in WTC and how the current study is going to address them.

The origin of the construct WTC

The WTC concept was originally developed by McCroskey and Baer (1985) in relation to communication in L1 and as an expansion of earlier works by Burgoon's (1976) on unwillingness to communicate, by Mortensen, Arnston, and Lustig (1977) on predisposition toward verbal behaviour, and by McCroskey and Richmond (1982) on behavioral approach toward shyness. Based on these constructs, McCroskey and Baer (1985) aimed to create a valid instrument for taking the gauge of interlocutors' free intention to communicate or not in a native language/ L1. As this concept is based on the investigation of an individual's desire to communicate in the L1, it can be understood more as a talking behavior formed since childhood. In this sense, it illustrates a personality trait, which remains stable in its sense across time and situations. As MacIntyre & Charos (1996, p.7) suggest, WTC is often conceived of as "a stable predisposition toward communication when free to choose to do so". However, some researchers (McCroskey and Richmond, 1990; McCroskey, 1997) pointed out that in addition to personality-based orientation which reveals one's regular characteristics,

the construct of WTC could partially incorporate situationally dependent features. Examples of these features are the mood of the person in that particular moment, the previous experience of communication with a certain person, their familiarity with the discussed topic and whether the communication is evaluated or not. Hence, early investigations of the nature of WTC elucidated its principal characteristics embodying both personality-based and situational orientations.

Early work on WTC in L1. Previous research on WTC was particularly allocated to the exploration of WTC in L1. The initial investigations on L1 WTC mainly focused on the intercultural communication as well as variables of L1WTC. Prior empirical investigations (Barraclough, Christophel & McCroskey, 1988; McCroskey, Burroughs, Daun & Richmond, 1990) were closely related to the cultural aspect. The diversity in communicative behaviors and orientations of representatives of various cultures posed certain problems. The first one pertained to misinterpreting the communicative behaviors and orientations of individuals from other cultures, given that what is appropriate in one culture may not be so in another one (Hall, 1959 cited in McCroskey et al., 1990). Samovar and Porter (1985) contemplate that human communication behavior is embodied in one's culture; thus, the amount of engagement in communication depends on an individual's cultural orientation (cited in Barraclough et al., 1988). Consequently, the second one regarded to the individual's predispositions to communicate. Therefore, the focus of researchers at that time was on the factors influencing the intercultural communication.

Then, cross-cultural divergence in WTC of representatives of different cultures started to be analyzed. McCroskey and McCroskey's (1986 a, b and c) works specifically focused on US student groups and their studies became as a model for further studies due to the applicability of data collection instruments used by these scholars and comparability with

their findings. The scholars applied three main data collection instruments: The WTC scale developed by McCroskey & Richmond (1985; 1987), Personal Report of Communication Apprehension (PRCA) designed by McCroskey (1982) and *Self-Perceived Communication Competence* (henceforth SPCC) scale created by McCroskey & McCroskey (1986) (cited in Barraclough et al., 1988). The studies which adopted the same instruments were pursued in Australia (e.g., Barraclough et al., 1988), Micronesia (e.g., Burroughs & Marie, 1990), Russia (e.g., Christophel, 1996), New Zealand (e.g, Hackman & Barthel-Hackman, 1993), Sweden (e.g., McCroskey et al., 1990) and Finland (e.g., Sallinen-Kuparinen, McCroskey & Richmond, 1991). This kind of comparison affected the switch from monocultural research to cross-cultural one.

The findings of the above-mentioned studies showed that an initial stage in dissecting the resemblance between cultures was to understand what was found and concluded in the prototypical studies. According to McCroskey and McCroskey's (1986a) works, the interrelation between variables is the following manner: *Communication Apprehension or Communication Anxiety (*henceforth *CA)* as well as introversion are negatively correlated with WTC, while SPCC is positively pertained to WTC. The findings of other studies juxtaposed this complex interrelation between communication orientations in the US with other countries. For instance, the data obtained in Australia (Barraclough et al., 1988) displayed a high degree of similarity with the study conducted in the US, however, later it was noticed a statistically significant difference in mean scores on WTC and SPCC. In case of Micronesia, Burroughs & Marie (1990) found that their participants illustrated lower level of SPCC and WTC and higher level of introversion and CA in comparison with American students. Moreover, the researchers descried significant sex differences. Swedish students in contrast to American peers in McCroskey et al. (1990) study perceived themselves as being more competent and introverted, and at the same time, less prone to initiate the

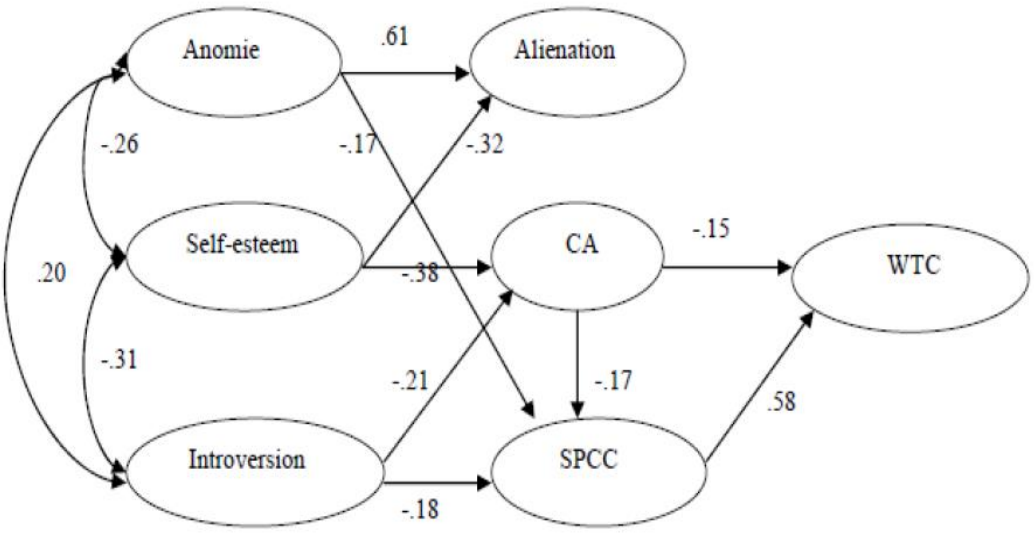
communication. Despite an introverted culture in Sweden and the opposite culture (extroverted one) in the US, the degrees of CA were similar which meant that the increase of CA affected the decrease of WTC. The spotlight of Sallinen-Kuparinen et. al's (1991) investigation of the Finns was that except the comparison with the Americans, they drew alignment with other countries too. Referring to comparison of US and Finland, the level of CA and SPCC were similar, but WTC and introversion were varied. Regarding the correspondence with the findings in above-mentioned countries, in point of WTC Finns had similarities with Australians, introversion was as among Micronesians and the level of CA and SPCC closely related to Americans. Hence, these studies showed the importance of taking into account the cultural aspects in further investigations.

Previous investigations of the variations in the degree of L1 WTC among individuals and its analysis unfolded certain variables or "antecedents" of the concept of WTC (Riasati & Noordin, 2011). Based on McCroskey's (1992) own research and a review of previous studies on L1 WTC, McCroskey suggests that L1 WTC is highly dependent on two major antecedents: CA and SPCC. The former is defined as "an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey, 1977, p. 78). This variable clarifies the dependence of the degree of WTC on the level of fear individuals feel with regard to communication which, ultimately, results on whether person decides to continue or avoid an interaction. That is, individuals with a high level of CA are likely to be less willing to communicate. The latter, SPCC is perceived as the perception of one's ability to interact effectively in a certain situation. Riasati and Noordin (2011) pinpoint that the more competent an individual feels about himself/herself, the more confident that individual will be while communicating with others i.e. more willing to communicate. Other empirical studies (e.g., Anyadubalu, 2010; Hashimoto, 2002; MacIntyre,

1994) found that these two variables, SPCC and CA, had a focal impact on one's level of WTC

Another approach to the investigation of the variables underlying WTC was applied by MacIntyre (1994). MacIntyre's (1994) attempted to understand the causal relations among six trait-like variables. Five of those variables were defined by Burgoon (1976) as anomie, alienation, self-esteem, introversion, and communication anxiety, and the last one - perceived competence - presented in McCroskey's (1992) WTC scale (MacIntyre, 1994). The data for further analysis were obtained from McCroskey and McCroskey (1986a) study. The analysis of those data assisted MacIntyre (1994) in hypothesizing a causal model of trait-like variables affecting WTC (see in Figure 1)

Figure 1. *A causal model of MacIntyre (MacIntyre, 1994, p.137)*



According to the causal model, WTC is opted to be a final point in this sequence of causal interrelations of variables as WTC is considered a volitional choice to engage in communication before the beginning to interact. The direct effect on WTC is predetermined by the variables like SPCC and CA which, in their turn, are rooted in self-esteem and

introversion. However, MacIntyre (1994) also considers that there are several limitations of the described model. Firstly, the model includes only personality-based variables while there are other situational variables like topic or conversational context which also influence on WTC. Secondly, the model does not imply the cases when the individual is not given a choice to initiate communication. Thirdly, the impact of WTC on the communication is not taken into consideration in this model.

This sub-section illustrated some earlier studies on cross-cultural communication and a variety of variables influencing L1 WTC which will be also discussed from the perspectives L2 WTC in the following sub-section.

Conceptualization of WTC in L2

Language is a broad and complex phenomenon closely connected with many aspects of our life. For instance, Jiang (2000) argues that culture and language are almost inseparable in nature. Consequently, knowing one language entails the understanding of the cultural aspect too. In this vein, an individual who learns and uses an additional language can become a facilitator of intercultural communication (Clément, Baker & MacIntyre, 2003), given that this person possesses complex experiences of communicating in both languages (Mitchel & Myles, 2004). Moreover, MacIntyre, Clément, Dörnyei and Noels (1998) point out that "L2 use carries a number of intergroup issues, with social and political implications, that are usually irrelevant to L1 use" (p.546). Thus, in pursuant to these ideas, the individual's WTC in L2 is different from the same person's WTC in L1 (MacIntyre et al., 1998).

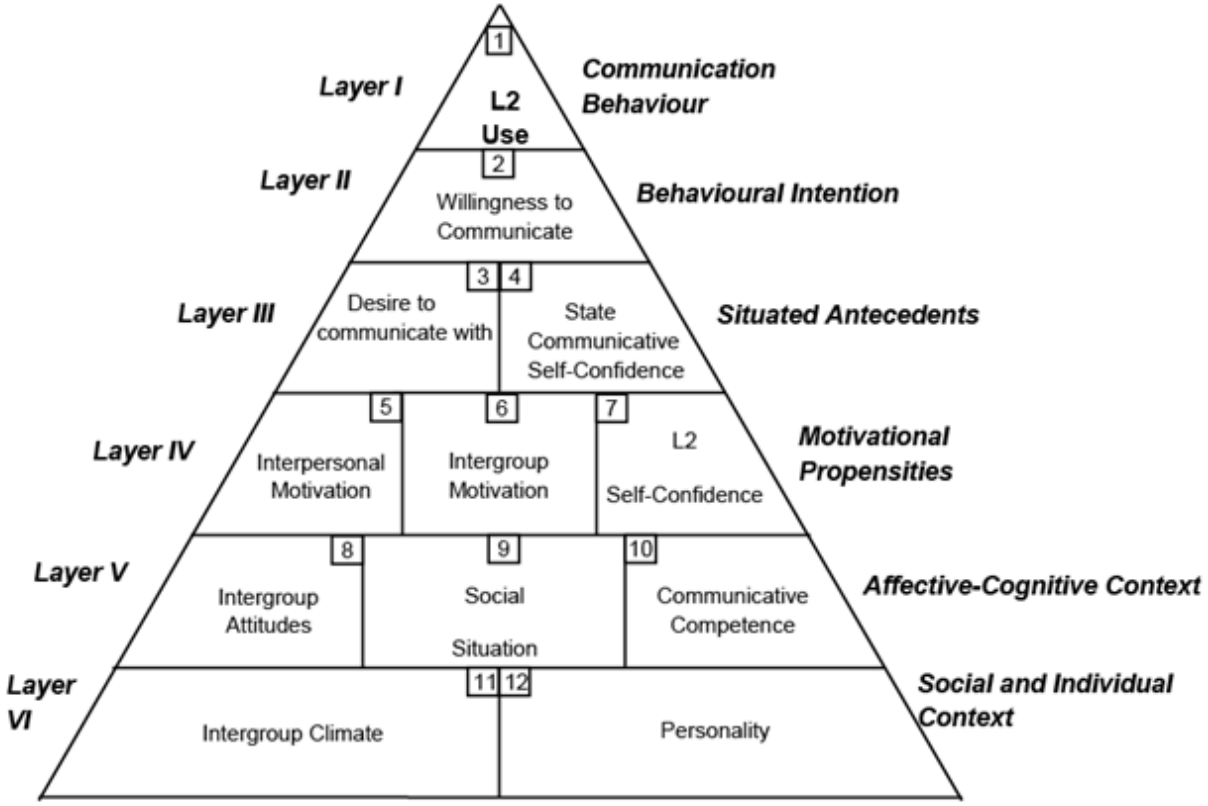
With the aim of describing the complexity of communication in L2, MacIntyre and associates (1998) developed a Heuristic model of L2 WTC based on McCroskey and Baer's (1985) model on L1 WTC. MacIntyre et al.'s (1998) model was rested on inquiring a learning environment in a second or target language (TL). MacIntyre et al. (1998) defines L2 WTC as

"a readiness to enter into discourse at a particular time with a specific person or persons using L2" (p.157). From this definition, the important roles of time and interlocutor(s) in L2 WTC are emphasized. Kang's (2005), however, presents a broader definition of L2 WTC, indicating that "WTC is an individual's volitional inclination towards actively engaging in the act of communication in a specific situation" (p.291). Based on Kang's (2005) definition, both personality-based and situational factors are taken into account. Examples of these factors are the topic, a conversational context, interlocutor(s) or a personal attitude to L2.

MacIntyre et al.'s (1998) heuristic model is a pyramid-shape (see in Figure 2) including a range of mental processes favorable for initiating communication. The layers in this model incorporate a variety of social, psychological, linguistic, and affective variables operating in a distal continuum. That is, situation-specific and trait-like factors conjoined into MacIntyre et al.'s (1998) model. This model includes twelve variables integrated in six layers. These layers are grouped into changeable (situational) variables (Layers I-III) and stable (individual) variables (Layers IV-VI). The first group highly hinges on time and context, while the stable nature of the second group entails that these variables are applicable to many situations. By placing these groups in the distance, MacIntyre and associates (1998) sought to demonstrate their hypothesis of significance of the changeable variable having immediate influences on one's L2 WTC over stable ones. As shown in Figure 2, the highest layer of the model comprises an individual's willingness to initiate communication with certain interlocutors at a specific time which is characterized as an ultimate stage leading to the actual use of L2 (MacIntyre, Baker, Clément & Conrod, 2001). Other layers presented in the model demonstrate the specific situations affecting the person's intention to L2 communication, which are: familiarity with the interlocutors, formality of the situation, and the context of communication (MacIntyre et al., 1998). Thus, the variables which have non-immediate

influences are placed at the bottom as a basement for pyramid and the situational influences are at the top.

Figure 2. *Heuristic model of variables influencing WTC (MacIntyre et al., 1998, p.547)*



Starting with the first three situational variables, Layer I in this model, *the L2 use,* represents *communication behavior* like reading newspapers and books in the original as an ultimate goal of learning the TL. However, *the L2 use* directly depends on the *behavioral intention* (in Layer II) referring to *WTC* as previously discussed. At the same time *WTC* is influenced by two *situated antecedents* in Layer III which are *Desire to Communicate with a Specific Person(1st)* and *State Communicative Self-Confidence(SCSC)(2nd)*.

As a means of connecting situational variables with the individual ones, four additional causal factors appear. The first two factors linking the first situated antecedent of

the Layer III with the variables *Interpersonal Motivation* and *Intergroup Motivation* from Layer IV are *Affiliation* and *Control. Affiliation* is significantly influential in the informal setting as there is a tendency to be linguistically engaged in L2 communication (integrative motive) driven by the interlocutor with higher level of L2 self-confidence or with the use of code-switching (MacIntyre et al., 1998). *Control* characterizes the type of interaction administered by instrumental motives which can be noticed when one of the interlocutors needs help or service manipulating the other one(s) while communicating. The other two factors conjoining SCSC *(*Layer III) and L2 Self-Confidence *(*Layer IV) are *State Anxiety* and *State Perceived Competence. State Anxiety* pertains to temporary emotional condition when a speaker becomes anxious in speaking in a specific situation due to certain factors such as unpleasant past experiences. *State Perceived Competence* is regarded as an individual's perception of own capacity to interact at a particular moment. It is noteworthy that there is a mutual influence between these two factors, thereby, an increase of one of them leads to the decrease of another one and, this, ultimately shows the level of *SCSC* and individual's L2 WTC. Overall, these four factors are the leading ones in defining a transition to higher levels of an individual's WTC in L2.

Turning to the Layer IV, *Motivational Propensities* signifies the beginning of stable variables operating as a basement which presents enduring (personal) influences and, being formed, effect to three aforesaid layers of situational influences. Continuing above-mentioned principle of dependence of higher levels on lower ones, the constituents of Layer IV, *Interpersonal Motivation* and *Intergroup Motivation,* are build upon both *Intergroup Climate* and *Intergroup Attitudes* found in a lower layer. Concerning the third variable of this layer, *L2 Self-Confidence,* it is also contingent on *Cognitive* and *Affective* variables from the lower level. Here, despite *L2 Self-Confidence* is known to be the situational variables of *SCSC,* it is still more stable in consideration of individual's confidence to communicate in L2 effectively

or worry to act in the TL. This stability can be mainly predetermined by *Cognitive* and *Affective* variables.

Moving to the Layer V, *Affective-Cognitive Context,* it embodies three other variables: *Intergroup Attitudes, Social Situation,* and *Communicative Competence*. The first of them combines three aspects: the *integrativeness* which is explained by the level of involvement to the L2 cultural group without a wish to be fully integrated in a new culture, the *fear of assimilation* as conjoining more into the L2 community could eventuate in a loss of the cultural heritage, and *the motivation to learn L2* cultivated through the enjoyment and satisfaction of L2 learning process and positive stereotypical perceptions of L2.

The last layer of enduring variables, Layer VI, presents *Social and Individual Context* and contains two variables, *Intergroup Climate* and *Personality*. *Intergroup Climate* implies certain features of a bilingual setting reinforced by linguistic vitality (S*tructural characteristics of the community*), and attitudes towards ethnic (L2) communities (*Perceptual and affective correlates*). According to the other variable, *Personality*, specific personality traits can positively or negatively affect the language learning process. Accordingly, this layer discloses an impact on L2 communication of such factors as the individual's personality characteristics in L2 speaking and setting where the interaction happens.

Based on MacIntyre et al.'s (1998) model discussed above, this model comprises a number of linguistic, social and psychological factors that can leave an impact on one's L2 WTC. In pursuant to the model, *Affiliation* and *Control*, are substantial constituents of L2 WTC as they are equally important for both situational and individual variables of this model. However, MacIntyre et al.'s (1998) model has been recently criticized by some scholars (e.g. Chang, 2018; Syed & Kuzborska, 2018). Together with the complexity of this model, Chang (2018), for instance, noticed that this model does not include the cultural aspect which,

despite its commonality, has a vital influence. Similarly, Syed and Kuzborska (2018) mentioned that the variables in this model relate only linearly to each other, while their study revealed that "interaction between variables underlying L2 WTC is characterized by interdependence, non-linearity and co-adaptability and self-organization" (p.17). The authors concluded that the strength of variables predicting speakers' L2 WTC alters from moment-to-moment, therefore, it is difficult to determine the ones as only strongly affecting or weakly. Even in a certain moment, due to varied strengths of WTC components, WTC in TL could be significantly complicated to be predicted. Moreover, Syed and Kuzborska (2018) argue that "students' silence also displayed dynamic features involving mental engagement, pre-occupation, cognitive block and inner speech and that their silence should not, therefore, be misconstrued as unwillingness to communicate in L2" (Syed & Kuzborska, 2018, p.17). Hence, Syed and Kuzborska's findings propose to perceive the concept of WTC in a more holistic way.

Empirical investigations on variables of in-class L2 WTC in Asian EFL contexts. As this study is centralized on exploring Kazakhstani EFL language learning situation, it is important to have a thorough insight into the investigations of L2 WTC in Asian contexts, where FL learning process mostly occurs in the classroom due to the insufficient exposure to L2 in naturalistic settings. Consequently, it becomes relevant to review the literature on classroom factors affecting fluctuations in Asian students' L2 WTC level. A number of empirical studies in Asian context (e.g., Chu, 2008; Jiaxin, 2018; Lin, 2019; Subekti, 2019) were devoted to explore classroom factors including motivation, self-confidence and situational factors as well which influence students' L2 WTC.

Prior research indicated that *motivation* has either direct or indirect effect on L2 WTC. On the one hand, the findings of the studies conducted in different EFL contexts

including Iran (Mohammadian, 2013); Korea (Jung, 2011); Taiwan (Chu, 2008; Wu & Lin, 2014); Turkey (Altiner, 2018) revealed a positive correlation between WTC and motivation. On the other hand, in pursuant to (Öz, 2016; Peng & Woodrow, 2010; Yashima, 2002), motivation could directly influence on speakers' communication confidence and, only then, through the mediation of it could indirectly affect WTC. In other words, higher level of motivation deteriorates the speaker's CA, which, at the same time, reinforces SPCC and WTC. Thus, the consideration of both types of effect motivation on WTC signifies the acceptance of motivation as an important predictor of WTC.

Empirical investigations of one of the aspects of motivation, *integrativeness*, revealed that the distinction in language learning contexts led to emergence of a new variation of this notion appropriate to the Asian context (Yashima, 2002; 2019). The notion of *integrativeness* itself refers to the student's intention to learn a new language by acquiring more about its culture, values, manner of life, and native speakers which makes them more integrated into that language learning environment (Chairat, 2015). However, due to the absence of the language learning environment for communicating outside classroom in East Asian context, completely different perspective to motivation to speak in L2 was proposed by Yashima (2002). EFL learners, according to Yashima (2002), use L2 mostly as a tool to assist them in communication with people from other countries and not orienting to a particular language community. This motivational propensity, named as an *international posture,* was viewed as "a construct to describe attributes toward an international community, readiness to work overseas, openness toward different cultural groups, and interest in foreign affairs" (Yashima, 2019, p. 208). The investigations of Peng and Woodrow (2010), Peng (2015), Yashima (2002) showed a significant correlation between international posture and L2 WTC. Hence, international posture expends the understanding of motivation as a predictor of WTC in EFL contexts.

One of the strongest aspects of the learners' motivation to in-class interaction was recognized as students' communicative/ linguistic self-confidence (Öz, 2016; Prasetyanto, Wibawani, Wardani & Drajati, 2019). Lee (2012) noted that this phenomenon relating, at the same time, to both motivational aspect and absence of language anxiety, was an influential indicator of language learning in EFL context where students did not have a chance to be directly connected with the representors of L2 community (cited in Abdallah & Ahmed, 2015, p. 1094). It was supported that students with higher level of self-confidence were more willing to actively participate in both inside (Abdallah & Ahmed, 2015) and outside (Fadilah, 2018; Lee & Lee, 2019) the classroom interaction. Here, it is also important to remind that in the MacIntyre's (1998) heuristic model self-confidence in L2 took place in both trait-like and situational dimensions, which implies that to participate in the interaction student should not only be confident in nature, but he or she can be decisive and confident to act or not in a specific moment.

Continuing with empirical studies on communicative self-confidence in EFL context (e.g., Fu, Wang &Wang, 2012; Ghanbarpour, 2016; Şener, 2014), it was found that almost all of them revealed self-confidence in L2 as one of the prime predictors of L2 WTC. Moreover, the investigations conducted in diverse parts of the Asia showed significant correlation of SPCC and CA which further predicted self-confidence in L2 (in China (Knell & Chi, 2012; Yu, 2011; Peng, 2014), Japan (Hashimoto, 2002; Yashima, 2002), Iran (Ghonsooly, Khajavy, & Asadpour, 2012; Rastegar & Karami, 2015), Turkey (Altiner, 2018; Asmalı, Bilki & Duban, 2015; Öz, Demirezen & Pourfeiz, 2015). These findings illustrated the importance of self-confidence in predicting L2 WTC. Furthermore, investigating the impact of communicative self-confidence on students' classroom interaction, the studies revealed that self-confidence was positively correlated with learners' oral communication proficiency and

academic performance (Abdallah and Ahmed, 2015), learners' achievements and motivation, but negative related to risk-taking (Pyun, Kim, Cho, & Lee, 2014).

Most studies in Asia (e.g., Bursalı, 2019; Jiaxin, 2018; Lin, 2019; Quyen & Tham, 2018; Yashima, MacIntyre, & Ikeda, 2018) recognized a significant role of situational variables in cultivating students' in-class L2 WTC. Jiaxin's (2018) study which involved high school Chinese students validated a profound effect of situational variables on in-class L2 WTC. Moreover, Jiaxin (2018) revealed three groups of these influential variables: interlocutor (varying according familiarity, number, attraction), topic (depending on familiarity and interest) and conversational context (influenced by misunderstanding and difficulties) (p. 196). Research with the similar purpose conducted in Iran (Riasati & Rahimi, 2018), Pakistan (Syed & Kuzborska, 2018), China (Zhang, 2018) found that situational variables fluctuated owing to classroom atmosphere, task types, interactive context, interlocutors, teacher, and topic. Hence, various moment-to-moment conversational variables could influence in-class L2 WTC.

Moreover, Subekti's (2019) study with 276 Indonesian non-English major university students revealed that situational variables had different effects on the students' communication behaviors at different levels of proficiency. This was found while interviewing students with different levels of WTC (low, medium, high). Subekti (2019) reported that such indicators of higher degrees of peers' and teachers' supportive behaviour and lower degree of SPCC were both directly proportional to the students' level of WTC. Moreover, respondents with low WTC reported an increase in WTC level when time to get ready was allocated, the number of interlocutors was few and the students were familiar with them. Furthermore, past language learning experience was found out having a direct effect on WTC, thus, respondents of medium and high WTC had positive experiences in the past, while

learners with low WTC reciprocally had negative previous experience (Subekti, 2019, p.373). This can be recapitulated that situational variables like support, time for preparation and past experience have also effect on in-class WTC.

Another group of studies (Liu, 2002; Marchand, 2012; Peng &Woodrow, 2010) in Asia were attempted to understand why some Asian students tend to be reticent to engage in in-class L2 communication. L2 researchers' views on the reasons behind students' reticence were divided. Some scholars mentioned linguistic (e.g., low level of language proficiency), psychological (e.g., lack of confidence) and contextual factors (e.g., unfamiliarity with topic), while others highlighted the importance of cultural factor (Yashima, 2019). Cultural factor known as having "face-saving" reason (e.g., not presenting lack L2 proficiency, not consuming peers' and teachers' time (other-directedness), not showing a disagreement with the teacher or any kind of confrontation and embarrassment (submissive approach to learning)) for reticence maintained performance-avoidance goals (Yashima, 2019, pp 213-216). Hence, students' silence does necessarily imply their unwillingness to talk. Rather, it could show some cultural factors.

To sum up, the issue of instructional WTC in Asian EFL context is under research for a long time. The investigations unveiled the constituent parts of in-class L2 WTC, which are various situational variables like interlocutor or topic and motivational dimensions like communicative self–confidence and international posture and cultural factors. The recognition of these variables and the comprehension of their interrelations assist instructors in provision of favourable conditions in the classroom and encourage language learners to be more active and willing to talk in a TL. Moreover, the information from this sub-section can be wholesome for selecting framework and instruments to gauge students' in-class WTC described in the following subchapters.

Theoretical Framework

In consideration of the strong effect of elements of motivation (e.g., integrativeness, international posture), communicative self-confidence and situational factors on in-class L2 WTC, the current study is guided by Dörnyei's (2009) 'L2 Motivational Self System' (LMSS) model. Originally, LMSS model was constructed on Gardner and Lambert's (1959) concept of integrativeness and psychological research on the self (as cited in Dörnyei, 2009). These broad concepts and results of investigations were integrated in a model consisting of three components described below.

1 – *Ideal L2 Self,* which represents L2-related side of the one's 'ideal self ', in other words, it is one's ideal vision of L2 competence. The ideal L2 self, pursuant to Dörnyei (2009, p. 17–18), relates to the future self-image that an individual internally wishes to achieve (i.e. it represents hopes, aspirations and wishes of one's personal, vocational or social purposes). The goals or visions directed by the ideal self-image, are essentially long-term because they are more internalized within the self, and less imposed by others or external factors. This is a strong motivator in L2 learning due to the intention to eliminate the distinction between individual's actual and ideal selves;

2 – *Ought-to L2 Self*, which shows one's vision of what should be possessed in order to meet expectations and to prevent from any potential negative consequences. Hence, it embodies one's sense of moral responsibilities towards L2 learning. The goals or visions channeled by the ought to self are more likely to be short-term than those referred to the ideal self as they are less internalized within the self, but largely directed by external factors in the socio-cultural environment.

3 – *L2 Learning Experience*, which involves one's situation-dependent motives developed in the immediate language-speaking environment and prior experience (interlocutors, teachers, and topic) (Dörnyei, 2009, pp.29).

In sum, LMSS model perceives the learning process from the perspective of learners' motivation and it also includes all highly influential factors for L2 WTC which shows in the alignment of LSMM model with the variables of L2 WTC. Based on this model it is aimed to define the factors influencing the senior students' L3 WTC in STEM subjects.

Instruments for assessing L2 WTC in the classroom setting

The main aim of conducting the current study is to identify the level of senior students' in-class WTC in English at STEM subjects and the factors influencing it. Therefore, it is necessary to opt for a tool measuring learners' WTC specifically in the instructional context. To accomplish this goal, Khatib and Nourzadeh's (2015) instrument, based on the existing literature to design and validate an Instructional Willingness To Communicate (IWTC) questionnaire, is utilized in the present research. One of the main reasons for selecting this instrument is that the psychometric properties (in the form of reliability and validity) of the proposing questionnaire were validated and well-established. Moreover, Peng and Woodrow (2010) and Cao and Philp (2006) do not recommend to employ generic questionnaires, such as highly quoted questionnaire of McCroskey's (1992), given that they include the communicative situations which are unlikely to happen in classroom contexts.

The steps of designing IWTC questionnaire included a) a revision of the existing literature in WTC in TL to identify constituent factors like affective, cognitive, social, instructional factors, trait-like variables and integrate then further in the scale; b) undertaking interviews with the prominent specialists and language instructors. Overall, the authors conducted questionnaires twice to analyze the gathered data with the help of exploratory

factor analysis in the first time, and the next time with the confirmatory factor analysis. As an aftermath of these statistically supporting procedures, a six-factor structured questionnaire embracing 28 items derived. These factors are:

- *communicative self-confidence* (a learner's personal beliefs of own abilities to comprehend and interact in TL. It consists of two elements: perceived competence and a lack of anxiety (Clément, 1980, 1986, as cited in Khajavy, Ghonsooly, Hosseini Fatemi, & Choi, 2016)
- *integrative orientation* (a learner's positive perceptions of TL culture);
- *situational context of L2 use* (different forms of situational variables in the classroom context having immediate influence on learner's communication behaviour in TL);
- *topical enticement* (a certain degree to which the topic of the learning materials could encourage students to engage in communication in TL);
- *learning responsibility* (a certain degree to which the learner feel own responsibility to improve own level of TL via communication in this language);
- *off-instruction communication* (a certain degree to which a learner manifest interest to interact in TL or engage in meaningful communication without any immediate educational forces) (Khatib & Nourzadeh, 2015, pp. 271-272).

Thus, these items, according to statistics, are considered to be significant for the instructional WTC in TL. Moreover, communicative self-confidence, integrative orientation (integrativeness) and situational context included in the scales were discussed in previous subchapters where empirical findings of studies in EFL context proved a significant impact of these variables on students' WTC. Other ones were also added after consideration of both significance and relevance of these variables in the classroom context. Regarding the topical enticement, Cao and Philp (2006) stated that familiarity with the topic will enhance learners'

communicative self-confidence, while unfamiliarity with topic may impede communication (cited in Khatib & Nourzadeh, 2015, p. 272). Learning responsibility is an important item in the Khatib and Nourzadeh's scale, as they incline to Kang's (2005) argument that learners feel themselves in charge of comprehending and constructing messages in TL in the communication due to certain pressures or motives appeared in the interaction process (cited in Khatib & Nourzadeh, 2015, p. 272). Khatib and Nourzadeh clarifies that off-instruction communication should be understood as a communication which is held on in educational settings but without any instantaneous educational forces to accomplish it. Therefore, Khatib and Nourzadeh's IWTC Scale is accepted as the most suitable for this study considering the initial idea of exploring the levels of in-class WTC and factors affecting it.

Overall, this subsection displayed an overview of the scale which is adapted to the current study. Any changes to the scale made for the sake of relevancy to the Kazakhstani case will be described in the methodology part. Turning to the Kazakhstani case, the next section will present the reasons why this study is needed to be conducted in Kazakhstan and what gap in the research it will fill.

Research gaps in WTC

This subchapter is aimed to present three ponderable reason of pursuing this investigation.

First, the investigation of students' WTC has garnered significant attention in Asia. It was found that there were undertaken studies on learners' WTC in EFL context in four out of six areas of Asia. They are in:

- East Asia (China (Jiaxin, 2018); Taiwan (Lin, 2019); Korea (Pyun et al., 2014); Japan (Yashima, 2002);

- South Asia (Pakistan (Ali, 2017);
- Southeast Asia (Indonesia (Fadilah, 2018); Malaysia (Razak, Nimehchisalem & Abdullah, 2018); Singapore (Croucher, Rahmani, Säkkinen & Hample, 2016); Thailand (Darling & Chanyoo, 2018);
- Western Asia (Turkey (Oz, 2014); Oman (Al Amrani, 2019); Yemen (Al-Murtadha & Feryok, 2017); Iran (Kamdideh & Barhesteh, 2019); Saudi Arabia (Alqahtani, 2015);

However, it was not found any research related to this issue in North Asia and Central Asia. Moreover, due to the diversity in linguistic situation and policy, the findings from the other parts of Asia are not comparable to the contexts of North Asia and Central Asia. Consequently, the investigations of learners' WTC have not carried yet in Kazakhstan, a region of Central Asia. Yet, the absence of published papers on the issue of WTC in Kazakhstani context could not be a concrete mark of an absence of investigations but probably an existence of still unpublished papers. Anyway, it is still a distinct sign of the necessity of exploring Kazakhstani learners' level of desire to interact in TL.

Second, all previously published studies concentrated mainly on student's WTC in L1 or L2. Nevertheless, the situation in Kazakhstan is different, where the trilingual educational policy functions. That is Kazakhstani students are educated in Kazakh (L1/L2), Russian (L1/L2) and English (L3). Taking into consideration that the current study is carried in subjects with English medium of instruction, it is expected to be a unique case in WTC studies.

Third, earlier research on WTC was undertaken in a language classroom setting. However, in Kazakhstan not only language classes, but also science classes in high school are

taught in L3 (English). Due to the lack of empirical investigations conducted to reveal factors influencing on in-class WTC in L3 in STEM subjects, this study attempts to fill this lacuna

To summarize, it was indicated a lack of investigations of L3 WTC in STEM classroom settings in Central Asia. Thus, this study aims to fill this gap.

Summary

It is time to conclude the main points from the literature review part. Here, it was described that the emergence of the construct WTC in 80s lead to further investigations of its antecedents in L1 such as Communicative Apprehension, Self-perceived Communication Competence. Later, MacIntyre et al. (1998) viewing stable and changing nature of WTC proposed a model of WTC in L2 incorporating both characteristics of WTC. A great amount of studies in Asia applied this model to examine students' WTC in different contexts and from various perspectives. According to those studies, motivation, communicative self-confidence and situational and cultural factors are influential for learners' L2 WTC in the instructional context. An alignment of these variables with the components of Dörnyei's (2009) LMSS model makes it possible the application of this model in the current study for defining factors influencing L3 WTC in science classes. Moreover, incorporation of the L2 WTC variables in IWTC Scale provides a chance to adapt it and apply in Kazakhstani context also to measure students' in-class WTC. Following chapter will demonstrate how the current is designed in detail.

Chapter 3: Methodology

An overview of the empirical studies on WTC done by Mystkowska-Wiertelak and Pawlak (2017), Zarrinabadi and Tanbakooei (2016) revealed three methodological orientations which changed through the time. According to the aforementioned studies, most previous investigations of WTC (Fushino, 2010; Hashimoto, 2002; MacIntyre et al., 2001; Peng & Woodrow, 2010; Yashima, 2002; Yu, 2011) were conducted quantitatively. This type of approach was mostly associated with the trait-like view of WTC. Later, with the change of the scope of research from trait-like to situational WTC, qualitative research approaches commenced to apply more as it allows to analyze the context of communication in depth from the perspectives of participants and dynamics of the occurrence of situational WTC(e.g., Cao, 2014; MacIntyre, Burns &Jessome, 2011; Riasati, 2012; Zarrinabadi, 2014). Recently, a number of studies have adopted a mixed-method approach in order to a) integrate and utilize the strengths of both paradigms for synthesizing separately existing trait-like and dynamic situational views of WTC; b) substitute the weaknesses of one of the approaches by the strengths of another one; c) and to present results that could be generalized (Zarrinabadi&Tanbakooei, 2016). Examples of WTC studies that used mixed methods in EFL contexts are in Turkey (Altiner, 2018; Bergil, 2016), Poland (Pawlak and Mystkowska-Wiertelak, 2015) Iran (Saeedakhtar, Hamidizare and Abdi, 2018) and Pakistan (Syed & Kuzborska, 2018).

Research design

A mixed-methods research is endorsed in the current study. A combination of the methods will provide an opportunity to identify senior students' level of WTC in English in STEM subjects through quantitatively-minded research and also reveal factors influencing their WTC in English through qualitatively-minded one. Being divided into two parts,

quantitative part is devoted to responses to the first research question –"What is the level of participants' WTC in English in senior secondary STEM subjects?", while the qualitative part is dedicated to find the answer for the second research question – "What influences these participants' WTC in English?". To better integrate and describe the data gathered from different approaches, a convergent parallel research design is chosen in this study. As Creswell and Clark (2011, p. 77) state, there are two reasons to utilize a convergent parallel design:1) for an endorsement and validation of the results coming from different approaches with the help of contradistinction and collation; and 2) for cultivating a thorough understanding of the whole phenomenon and juxtaposing numerous levels found to be in the same entity.

Instruments

Questionnaire. In the present study, the data was collected from a questionnaire and semi-structured interviews. The first instrument of this study was closed-ended questionnaire (see Appendix A) for collecting data from a larger number of students to reveal common trend for the beginning. Moreover, Cohen, Manion, & Morrison (2011) specified certain features of this survey instrument which made the questionnaire itself beneficial for the current study. The strong points the authors mentioned were the followings: a) questionnaires provide standardized information because all participants respond to the same questions; b) questionnaires provide a possibility to detect frequently appearing phenomenon through manipulating the data; c) as the data is collected on a one-shot basis, it is found to be cost effective and efficient; d) this instrument could provide anonymity and confidentiality for its participants. However, the use of a questionnaire in empirical studies has its own drawbacks. Debois (2019) warned that in a questionnaire respondents could skip certain queries, misunderstand questions or even provide unjust responses. The author also appended that a

difficulty with identification of the emotional constituents of a given answer could happen. As the present study is a mixed methods one, there was a chance to substitute the weak points of the quantitative part with approaches available for qualitative research design. In this connection, interviewing was applied to avoid the case when the interviewee misinterpreted the inquiring questions and to reveal the interviewee's emotions, attitudes and understanding of the particular aspect investigating in the research.

Turning to the closed-ended questionnaire itself, the questionnaires developed by Khatib and Nourzadeh's (2015) and Peng's (2019) were adapted in this study (see Appendix A). These questionnaires were created to measure STEM students' WTC in instructional contexts. The integrated version of these questionnaires in this study, mostly, was based on a six-factor structured Instructional Willingness To Communicate (IWTC) Scale analyzed and developed by Khatib and Nourzadeh (2015). These six factors for gauging in-class WTC were communicative self-confidence, integrative orientation, situational context of the second language use, topical enticement, learning responsibility, off-instruction communication. Yet, two of these factors, naming as integrative orientation and off-instruction communication, were excluded from this study. According to Khatib and Nourzadeh (2015), the integrative orientation manifested as the students' interest in L2 culture and intention to identify themselves with speakers of this language could strongly influence on the learners' language learning. Nevertheless, in the context of STEM classes, the topics for discussion were driven by the science-related topics and less pertinent to L2 cultural issues as in the language classrooms. Therefore, it was concluded to eliminate this factor from this study. Due to the absence to the language speaking environment, off-instruction communication was also excluded. Regarding the inclusion of the Peng's (2019) questionnaire, it was only partially incorporated in the study because except WTC Peng (2019) studied the issue of modality which was not under investigation here. Nonetheless, the other part of questions in Peng's

(2019) study perfectly related to the Khatib and Nourzadeh's (2015) factors discussed earlier and, moreover, these questions did not overlap with the Khatib and Nourzadeh's ones. Thus, both questionnaires were combined to discover the level of in-class WTC of STEM students. Another point to add here is that the validity and reliability of the proposing questionnaires were on a high level.

Individual semi-structured interviews. In-depth semi-structured interviews (see Appendix B) – the second data collection instrument – was used to understand what influenced students' L3 WTC. According to Ritchie Lewis, Nicholls, & Ormston (2013), semi-structured interviews represent "a powerful method for generating description and interpretation of people's social worlds and as such a core qualitative research method" (p. 178). Due to such features as concentration for rich and detailed answers, flexibility in posing questions for interviewees and not being stuck to the prepared set of questions, the interview is accepted as a valuable tool to gather data (H. Rubin & I. Rubin, 2011). Moreover, Barkhuizen, Benson, and Chik (2014) argued that the questions in semi-structured interviews are "usually open-ended to allow participants to elaborate on and researchers to pursue developing themes" (p. 17). Therefore, follow-up questions throughout the interviewing process was used to illuminate the meaning, develop my understanding of what each participant says and seek examples from their experience of the phenomenon under investigation (i.e. WTC in English).

Overall, the study including two data collection tools, started from questionnaires (as quantitative side of the study) and finished by interviews (as qualitative procedures).

Sampling and setting

Convenience sampling strategy was applied to invite students of one mainstream school to participate in the quantitative part of the study due to their availability and

possibility to provide insightful information by answering questions (Creswell, 2014). In selecting the participants for the study, the following sampling criteria were adopted: all participants were high school students, STEM subjects were taught in English, the participants' level of English proficiency could have been various, none of them could have lived outside of Kazakhstan in order to attain a greater chance of capturing their WTC in English and none of the participants were known to the researcher before the data collection stage. The selection of the participants for interviewing was realized with application of purposeful sampling strategy, as it "might provide 'useful' information/give voice to 'silenced' people" (Creswell, 2014, p.228). Thus, purposeful sampling helped the researcher to obtain a detailed understanding of the phenomenon.

As mixed methods research design consisted of two parts, the involvement of participants pursuant to data collection tools was also mentioned. For an interview part, ten senior students were asked to be interviewed based on the above-mentioned criteria. Grade 9 students of a chosen research site were also invited to complete a survey.

Related to the site, one of the mainstream schools in Nur-Sultan city where STEM subjects in 9^{th}, 10^{th}, 11^{th} grades are taught in English was selected as a representative of typical Kazakhstani mainstream school introducing trilingual education. Before entering the chosen site I obtained the required permission from gatekeeper to invite other individuals to participate in the study. There were seven classes of grade 9 with about 200 students.

Data collection procedures

For inviting to participate in questionnaires and interviewing learners under eighteen, the permissions from the people involved in the study (see Appendix C for informed consent forms in three languages) were obtained. As the main gatekeeper was a headmaster, I contacted her first and presented detailed information of the procedure designed for collecting

data from students and an informed consent form. The consent form included the following information: the purpose, the time allocated to spend at the site to gather data, the approximate time required for interviewing and answering the questions in the questionnaire, the protection of anonymity and confidentiality, and risks and benefits for the participants. After receiving approval from the head teacher, the teachers of the grade 9 were informed about the students' involvement in the study. First, I met with the teacher of those seven classes and we allocated time when I could meet with the students and talk about the study. I chose the time which did not clash with lesson times. During the meeting I introduced myself using our shared languages of Kazakh and Russian. I also explained in simple terms the significance and the purpose of my research, and invited the students to take part in the study. After the meeting I prepared a letter with detailed information about the research in Kazakh and Russian. Later teachers sent this letter to parents to inform them and receive permission from them. Parents of 180 students agreed to their children's participation in the study. Children whose parents approved their involvement in the study also further were asked whether they were concurrent themselves to participate or not. 10 students refused taking part in the study. Thus, 170 students agreed and completed questionnaires.

As the participation in the interviewing part was voluntary, only those students who answered that they were concurrent to take part in an interview by ticking the last question in a survey were interviewed. There were 10 students who agreed to participate in the study. Before starting to inquire actual interview questions I introduced myself and told the purpose of this research together with the importance of using some strategies to boost the interviewee's trust to share their ideas with me. I also informed what actions were done to gather the data and where it would be presented. Further I acknowledged the interviewees with ethical issues (confidentiality and anonymity). Then, I mentioned the interviewees' rights to refuse to respond to certain queries at any time or even discontinue participation.

Finally, I asked whether the interviewee agree to participate in the study, to be interviewed and recorded on a sound record. Additionally, Hennink, Hutter, & Bailey (2011) highlighted the significance of building rapport with the interviewee for creating a favorable atmosphere for all participants, especially at the beginning of the interview. Each interview lasted approximately for 30 - 40 minutes. Each participant was interviewed only once in a language he/she opted for. All interviews were recorded on the voice recorder application on my smartphone. Moreover, all interviews were conducted in a quiet room in order not to divert students' attention away. By way of gratuity, all participants received chocolates. Overall, the data collection process lasted for a week.

Data analysis

The description of the process of data analysis is provided here. Data collected from the questionnaire were analyzed through SPSS software program. Descriptive statistics were applied to "indicate general tendencies in the data (mean, mode, median), the spread of scores (variance, standard deviation, and range), or a comparison of how one score relates to all others (z scores, percentile rank)" (Creswell, 2014, p.182).

Regarding the qualitative data, recorded interviews were transcribed with the help of the "Otranscribe" free online HTML5 app which has functions as slowing down the pace of the recorded speech and, another helpful option, repeating of the last 3-5 seconds of the speech after replaying back. Then, transcribed data were coded with application of thematic analysis (TA) which is known as "a method for identifying, analyzing, and interpreting patterns of meaning ('themes') within qualitative data" (Clarke & Braun, 2017, p. 297). Moreover, according to Clarke and Braun (2017), the flexibility of TA allows indicating marked features both within and across gathered data with regard to interviewee's experience, practices and perception. Due to this organic approach to the generation of codes and themes,

TA was applied in this study. Clarke and Braun's (2013, 2017) systematic guidelines for conducting thematic analysis (TA) were adopted to analyze the semi-structured, in-depth interviews with the participants.

Special emphasis in initial stage was given to familiarization with data through repeated reading and noting 'actively, analytically, and critically' (Clarke & Braun 2013, p. 205) through considering both the surface and hidden meanings of the participants' words in order to find patterns. Having first set of ideas, the movement to systematic approach of defining initial codes of interesting and unique features in data by using highlighters or coloured pens was undertaken in following stage. Example of generating initial coding from this study is provided below in Table 1.

Table 1. *Example of generating initial codes*

Data extract	**Coding**
Interviewer: Do you feel that being less willing to communicate in English influence your educational achievements? If yes/no, why? **Interviewee:** It can affect 100% if these classes are taught in English and you do not understand it, it will affect your achievements. Probably it could affect to the future if somebody wants to study abroad, so it is better to start now.	WTC→E.A →(1) understanding of topic and →(2) international posture

This stage was pursued by searching for potential themes among meaningful groups of coding. Then, identified themes were reviewed with reference to consistency with the entire set of collected data which was continued with creation of a 'thematic map'. 'Thematic map' of the current study is presented in Chapter 4. In order to enhance the reliability of the findings of this study, the 'coder reliability check' (Van Rossum & Hamer, 2010) was used by sending the initial codes, along with the participants' transcripts, to my supervisor after

obtaining the participants' permission. We discussed and compared the coding process. This process led to the development of certain themes**.** The next stage was related to theme labeling; where the clarity of the names of themes and their definitions were highlighted as they needed to capture the whole essence of the main focus of the theme. Final stage related to the report writing of the analysis of selected data extracts in correlation with research questions which can be found in Chapter 4.

Overall, the analysis of both quantitative and qualitative data were compared, interpreted and discussed in subsequent chapters.

Ethical issues

To start the data collection process, I passed the Collaborative Institutional Training Initiative (CITI) courses successfully, moreover, I received an ethics approval from NUGSE Research Committee. Following step was the obtainment of the permission from the head teacher, students and their parents which detailed description is provided in the section 3.5.

Anonymity and confidentiality of participants are important issues to consider in the ethical part of any research. Despite these terms are used interchangeably, the anonymity, particularly, means a protection of participants' personal data at all time and confidentiality implies a provision of preservation of gathered data confidential at any time (Cohen et al., 2011; Hennink et al., 2011; Mertens, 2015). One of the difficulties of the procuring of confidentiality and anonymity in qualitative type of study is due to the necessity to report the findings with the use of direct quotation of respondents' replies with their names (Hennink et al., 2011). To overcome this challenge, the names of the participant were changed to number from one to ten.

The transcriptions of the interviews of the present study were conducted by the researcher only; therefore, confidentiality was assured. Hennink and associates (2011) also

underpinned that the choice of place for conducting interviews is important, as there is a possibility to be overheard by other people if the interviews are held in an outdoor location or respondents' home places. Therefore, a quiet room for conducting an interview was prepared beforehand. Moreover, despite the difficulty of reaching anonymity in one-to-one interviewing, Cohen et al. (2011) and Mertens (2015) proposed to replace the names of all interviewees with pseudonyms in the transcripts. Respondents involved in the questionnaire also were not asked to provide any personal information to ensure their anonymity (Cohen et al., 2011). Moreover, in consideration of ethics in questionnaire, Creswell (2014) adds that "IDs linked to respondents can be an effective means of protecting individual identity" (p.432). To assure confidentiality the gathered data were stored in Google Drive and nobody except the researcher and her supervisor had access to them. After two years the data of the present study will be destroyed.

This study contained minimal risks for the participants. These risks were related to potential negative emotional reactions during the interview that participants could encounter in relation to their past language learning experiences. In case of an unexpected emotional behavior from the respondents' side, as Hennink et al. (2011) suggested, the researcher was ready to show compassion and ask the interviewee whether he/she was willing to finish or continue the interview in order to avoid any distress to the interviewee.

Summary

This chapter presented and justified certain features applied in the current study like the research design, research instruments, sampling and setting, data collection procedures, data analysis approaches, and ethical issues. The coming sections will demonstrate an analysis of the findings.

Chapter 4: Findings

This exploratory study has been designed to investigate the level of Kazakhstani students' willingness to communicate (WTC) in English in senior secondary STEM (i.e. Science, Technology, Engineering, and Mathematics) subjects as well as the essential factors that affect their L3 WTC. In order to reach these goals, the following research questions were posed:

1. What is the level of participants' WTC in English in senior secondary STEM subjects?

2. What influences these participants' WTC in English?

This chapter illustrates the data gathered from two data collection instruments: a close-ended questionnaire and semi-structured individual interviews. The findings are organized into two sections according to research questions. The first section presents the participants' level of WTC in L3 in science subjects; it is divided into two parts, which include the general portrayal of the formation of students' L3 WTC through the exploration of their experience of learning STEM subjects through L3, and the descriptions of the variables of WTC in TL. The second section is dedicated to the presentation of qualitative data viewed through the perspectives of Dörnyei's (2009) model of 'L2 motivational self system' (LMSS). These qualitative data are utilized to interpret and explain the quantitative findings.

Answering research questions

RQ1. What is the level of participants' WTC in English in senior secondary STEM subjects? This section displays the findings on the participants' level of L3 WTC in STEM subjects. Pursuant to 170 students' responses of the questionnaire and 10 interviewees' answers, the students' level of L3 WTC is below average. The detailed presentation of the

findings with reference to the first research question is provided in the two following subsections. The first subsection displays the qualitative data; the second one exhibits the findings of the quantitative part of the study.

Qualitative Findings. The first interview question in this study sought to determine the students' background in terms of their previous education and language of instruction (LOI). However, the interviewees' responses for this question significantly assisted in gaining an understanding of not only their prior experience but also its effect on their current intention to engage in L3 communication in STEM classroom. The features required for L3 WTC discussed by the majority of participants were having experience of being taught other subjects through English and taking part in additional courses for language practice. The existence of both features in students' backgrounds is found to have a positive impact on L3 WTC, while the absence of one or both has a negative effect on WTC in L3. The responses of the participants could clarify this inference, as shown in the following interview extract:

> I was studying in a school in Karaganda, where English was not taught. There were only additional courses as language clubs. And there were many of us in the class, including me, who did not know English. Therefore, it was very difficult for me when STEM began here…. But now despite the hesitations while speaking in English, I can say that I'm still at an average level. … On average, I feel more willing to speak in English when I know the topic and I know how to form my speech correctly. (Participant 3, 2019)

In this extract, it is noticeable that the interviewee had neither experience of learning through L3 nor involvement in any course for acquiring and practicing language, as a result of this, the student faced linguistic challenges when English started to be used as LOI in science classes. Moreover, from the perspectives of L3 WTC, the participant mentioned the necessity

of certain conditions being present before being ready to speak in L3. However, the opposite situation is described by another participant:

> In the previous school ICT classes started from 6th grade and they were completely in English compared with this school program where it started in 8th grade. Therefore, studying here comes easy for me. Moreover, I go to a language club and now I am in intermediate level. … I feel more WTC in English when I sit at the first desk as I have bad eyesight. I also like it when the teacher asks questions and waits for our answer as in the usual way we do it in Russian. In this case, I try to answer in English. But sometimes, I can forget some words or I can give wrong answers. However, overall, it is not scary if you have such experience from the 6thgrade. (Participant 6, 2019)

This extract demonstrates that being experienced in learning through English and having enough language practice positively affected the student's WTC in science classes. This justifies, once again, the effect of these conditions on the learner's L3 WTC by presenting a positively developing scenario in terms of language and content for students in science subject classes. Nevertheless, the following situation described by another participants quite complicated, but it is still related to the idea of how both linguistic background and experience in educating through English can influence a students' L3WTC:

> I studied in a private primary school where we had three classes of English every day. It was not a usual English lesson. We had books called PACE. We were studying mathematics, science and this book also included the meaning of words with which we worked every day. In a year we needed to finish 30 PACEs. One PACE includes several subjects. We did not have lessons where teachers explained tenses, we just did PACEs. But I can't say that my English improved at all. As doing

> PACEs we did not talk. We were sitting in individual desks closed from all sides and we needed to read and do tasks on mathematics and science and meaning of words and then raise our hands and go to the teacher to check. In this way we finished one PACE. We rarely discuss with the teacher. Overall, it just helped me to know many words, but I could not connect them because I did not know the tenses. … But now I am going to the language courses of English for intermediate level …. Concerning STEM classes, I can say that due to the update program I do not understand mathematical subjects like physics, mathematics, and chemistry starting from the 7thgrade. I just sit at these lessons and do not understand at all. … I can say that I feel more confident and more willing to speak in English in the classroom when I know that I understand everything. If it is not, I could not even finish the sentence, because I do not understand it. (Participant 7, 2019)

Here, despite the existence of experience of learning through L3 in primary school, the student did not have the possibility of mastering L3 communication. It is only by participating in additional courses (it is paid classes of English which students attain after school. The classes can be both individual or in groups up to 10-12 people) that the student developed communicative skills in L3. However, by high school time, the student lost all interest in science subjects due to the complication of the educational program. Thus, the third case presents a student with a good level of proficiency in L3 being unwilling to speak in L3 in STEM subjects as a result of his lack of comprehension of what it was covered during the lessons.

The analysis of participants' responses revealed that their L3 WTC was largely formed on both previous experience of learning any subject through English and long-term participation in language courses.

These cases represent various levels of L3 WTC among participants: being unwilling (participant 7), having a moderate level of willingness (participant 3), and keeping high level of willingness (participant 6). These differentiations were principally based on their prior experience in practicing language and content. Moreover, all of mentioned levels present only individual cases. In order to understand Kazakhstani students' level of willingness to engage in L3 communication in STEM subjects, it is necessary to monitor statistical data.

Quantitative Findings. *General overview of the quantitative data*. An overview of the findings related to the quantitative part of the study is introduced in this subsection. As was mentioned in the methodology chapter, the questionnaires for measuring participants' level of WTC were developed by Khatib and Nourzadeh's (2015) and Peng's (2019) questionnaires and adapted to Kazakhstani science subjects classroom realities. These questionnaires have a high level of validity and reliability. The adapted version of the questionnaire is constructed from four variables of WTC in TL: confidence, situational context, topic enticement, learning responsibilities. The collected data assisted in the development of a general portrayal on Kazakhstani STEM students' WTC in instructional contexts. As a means of evaluation, descriptive statistics in SPSS was utilized.

Central tendency. Table 1 illustrates the summary statistics for the number of sub-variables of each one. From the quantitative data, the mean score for confidence, situational context, and learning responsibilities among senior students is lower than moderate (M=2.726, M=2.626, 3,245 respectively). Interestingly, the average score for students' interest in the topic is extremely low (M=2.650). The findings of these variables will be explained in the subsequent section further.

Table 2. Descriptive statistics 1

#	Variables	Min.	Max.	Mean	Number
1	Confidence	2,139	3,485	2,726	10
2	Situational context	2,135	3,194	2,626	8
3	Topical enticement	2,650	3,160	2,650	5
4	Learning responsibilities	3,101	3,479	3,245	6

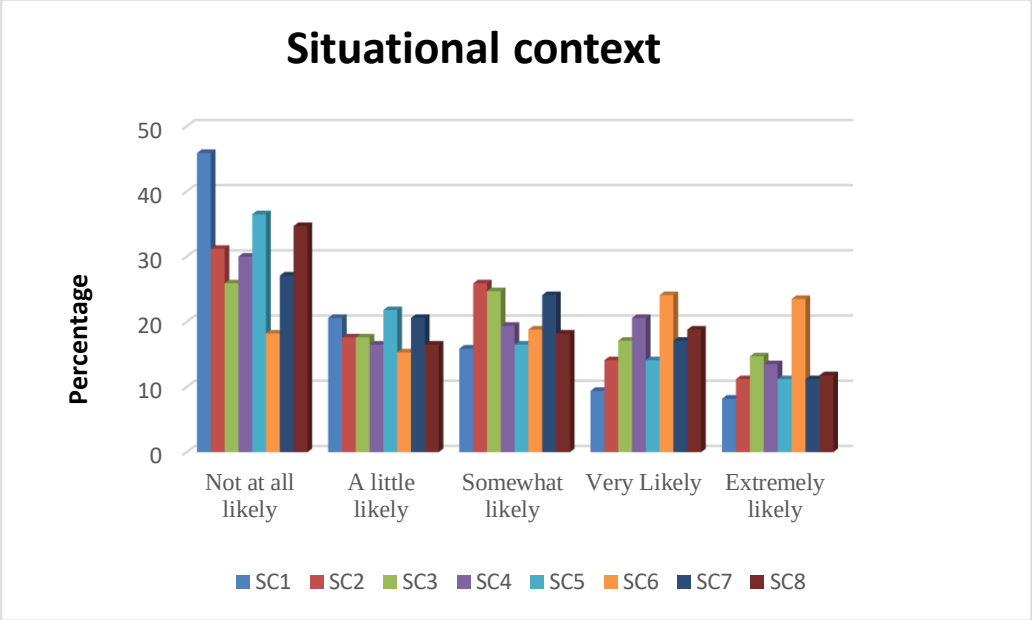
Analysis of variables. Confidence. The closed-ended questionnaire used in this study included ten positive statements related to the students' level of confidence. All responses were based on a five point Likert scale where one stood for "Not at all likely" and five meant "Extremely likely". The summarized responses of 170 students on their confidence in L3 in the dot diagram (see Figure 3) indicate that, in general, the average level of confidence is approximately 25 per cent for all variants on the Likert scale. However, the two groups on the extremes ("Not at all likely" and "Extremely likely") have a high percentage of responses for certain statements (almost 50% and slightly above 35% correspondingly). Two highly negative responded statements are: a) "C10 – I speak in English in STEM classes when no one else is talking"; b) "C3 – I give a presentation in English in STEM classes in front of my classmates". Originally, these statements represent strong confidence in TL, however the students' responses depicted an opposite picture of almost half of the students having lack of confidence in English. A positively replied statement is C6 – "I speak in English in STEM classes when I know the correct answer". This explains that preparedness to the question raises the level of L3 confidence among students, whilst the situations requiring more attention from the audience decrease it. The analysis of these results and further ones are provided in the discussion chapter.

Figure 3. *Confidence*

Note:
C1. I speak in English in STEM classes even if other students laugh at my language mistakes
C2. I speak in English in STEM classes even if I know my classmates are better than me at speaking English
C3. I give a presentation in English in STEM classes in front of my classmates
C4. I speak in English in STEM classes even if my language mistakes are frequently corrected by the teacher
C5. I talk in English in STEM classes in group-work activities
C6. I speak in English in STEM classes when I know the correct answer.
C7. I speak in English in STEM classes when I can really clarify the issue under discussion.
C8. I speak in English in STEM classes when my views differ from my classmates' views.
C9. I speak in English in STEM classes when my views differ from the teacher's views.
C10. I speak in English in STEM classes when no one else is talking.

Situational context. This bar-chart below based on the responses for eight statements shows a downward trend. According to Figure 4, negatively responded answers (about 35-45%) outweigh positive ones (approximately 15-25%). The statements acted in the response as mostly unfavorable situations for engaging in L3 communication are a) SC1 – "I speak in English in STEM classes when no one else is talking"; b) SC5 – "I speak more in English in STEM classes when I am sitting in the front of the class"; c) SC8 – "I speak in English in STEM classes when the class is engaged in an open discussion or debate". Whereas the mostly positively supported statement among students is SC6 – "I speak more in English in STEM classes when I know exactly what has to be done". Overall, the situations when the student is familiar with what he/she is expected to accomplish enhance one's L3 WTC, while the opposite situations have the deteriorating effect on L3WTC.

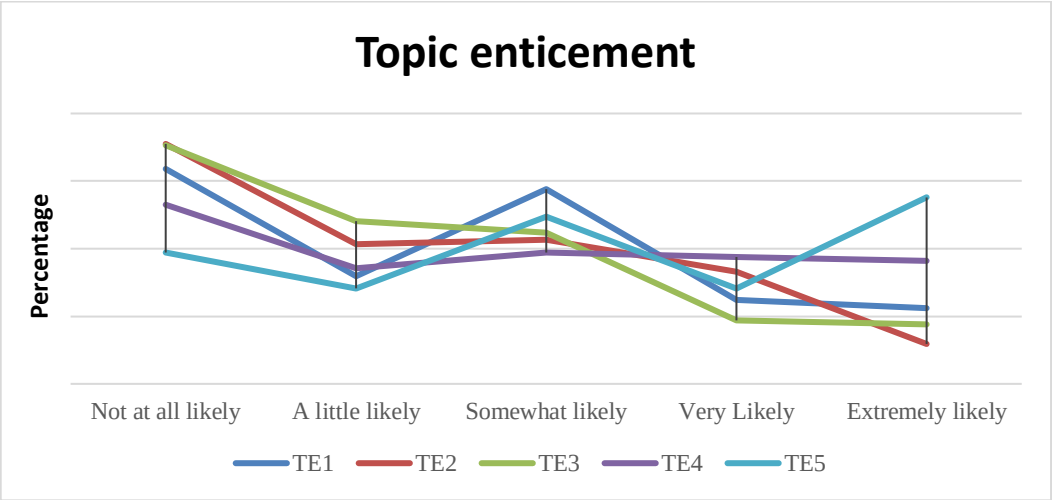
Figure 4. *Situational context*



Note:
SC1. I speak in English in STEM classes when no one else is talking.
SC2. I speak more in English in STEM classes when a discussion is related to my own personal experiences
SC3. I began to speak more in English in STEM classes after I became familiar with my teacher
SC4. I find opportunities to speak in English in STEM classes no matter how crowded the classroom is
SC5. I speak more in English in STEM classes when I am sitting in the front of the class.
SC6. I speak more in English in STEM classes when I know exactly what has to be done
SC7. I speak more in English in STEM classes when the teacher provides a timely response to my concerns.
SC8. I speak in English in STEM classes when the class is engaged in an open discussion or debate.

Topic enticement. Data gathered from five statements on topic enticement revealed some interesting findings. As the line graph below shows, the responses for the statement TE5 – "I speak more in English in STEM classes when the topic is interesting" received around 30 % for each of the levels (negative, moderate and positive levels) equally. On the contrary, two other statements a) TE3 – "I talk in English to brainstorm ideas to solve tasks in whole-class discussions in STEM classes"; b) TE2 –"I talk to my classmates in English in STEM classes about recently learned material" gathered negative responses at 35% each one. This indicates that in general the interest in the topic in STEM subjects is at a quite low level (30%).

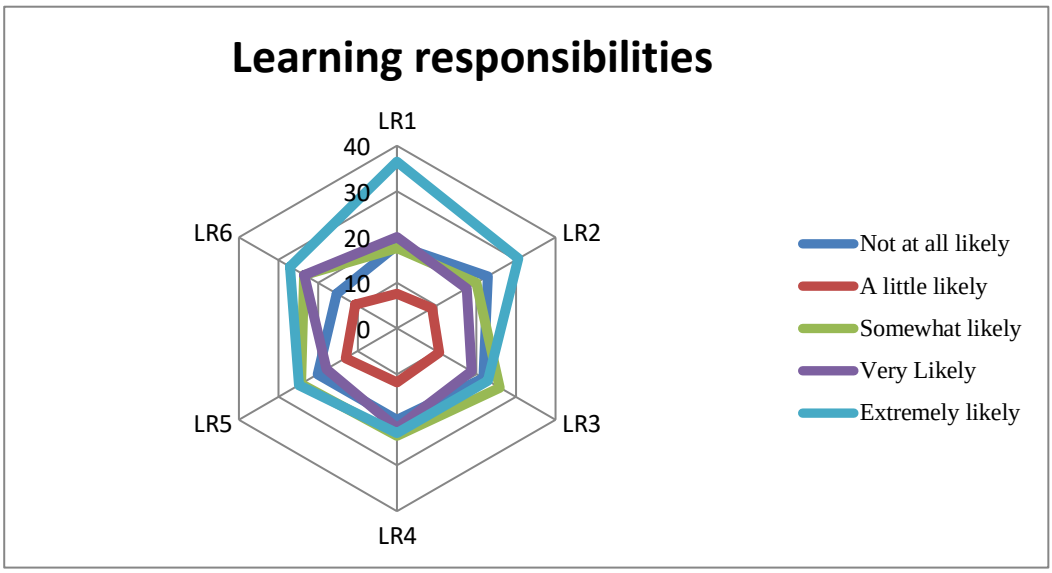
Figure 5. *Topic enticement*



Note:
TE1. I talk to my classmates in English about my ideas for experiment in STEM classes
TE2. I talk to my classmates in English in STEM classes about recently learned material
TE3. I talk in English to brainstorm ideas to solve tasks in a whole-class discussion in STEM classes
TE4. I talk in English about topics I know (such as human body systems or forms of energy) in a group discussion in STEM classes
TE5. I speak more in English in STEM classes when the topic is interesting.

Learning responsibilities. The responses to the statements related to learning responsibilities depicted in the radar chart below (see Figure 6) show almost the same pattern among all participants. From this data, unlike the above-mentioned graphs, the percentage of the positive responses for the variable (learning responsibilities in this case) is higher (up to 36 percent) than the percentage of negative ones which are slight above 20%. Statements receiving the highly positive responses mainly refer to asking peers about correct pronunciation and grammar, and communicating in English when the participation is being graded. This highlights that students' learning responsibilities towards learning through English is justifiably higher.

Figure 6. *Learning responsibilities*



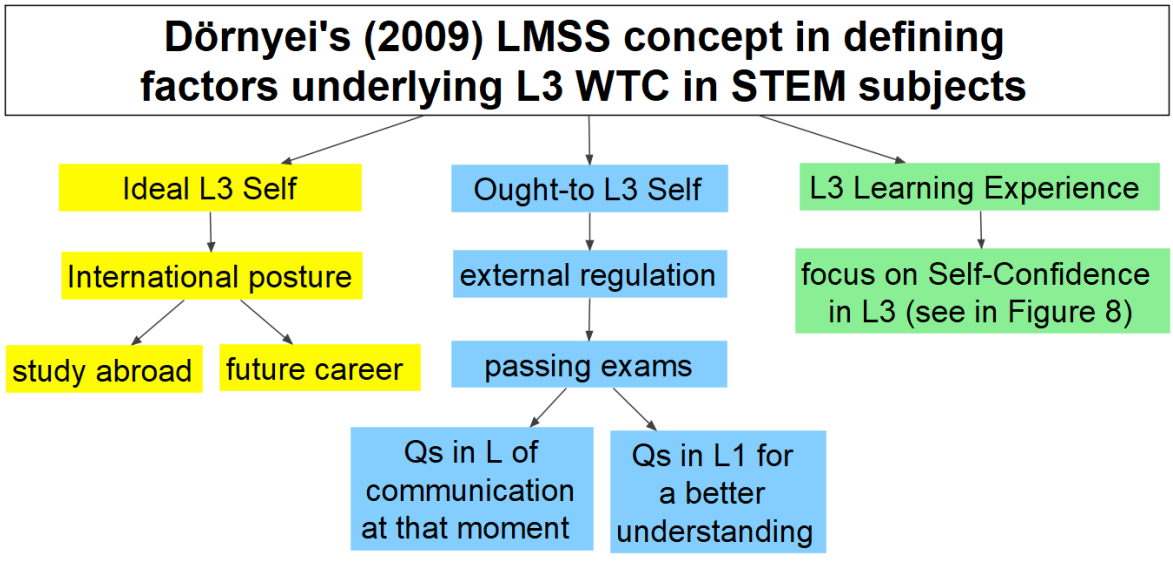
Note:
LR1. I ask my classmate about the correct pronunciation of a new English word
LR2. I ask another student to explain the grammatical rule in English
LR3. I ask my teacher in English to repeat what he or she has just said if I did not understand it
LR4. I raise your hand to ask or answer questions in English
LR5. I speak in English when I am ready for STEM classes.
LR6. I speak in English when my participation is being graded.

Taken together, these results reveal that both previous experience of learning any subject through English and participation in language courses establish one's L3 WTC. The quantitative analyses of data highlight the fact that despite high positive levels of learning responsibilities among students, other variables of WTC in TL are more negatively responded. Therefore, the overall level of L3 WTC is below the average. The analysis of these findings will be provided in the discussion chapter.

RQ 2. What influences these participants' WTC in English? This section aims to introduce the factors that are influential for participants' L3 WTC in STEM subjects. The section is devoted to the qualitative findings presented through the perspectives of Dörnyei's (2009) LMSS concept.

Qualitative Findings. L3 Motivational Self System in defining factors underlying L3 WTC in STEM subjects. The results of the qualitative findings came into alignment with Dörnyei's (2009) concept of 'L2 motivational self system' (LMSS) consisting of three components which were changed to the L3 context in this study: ideal L3 self, ought-to L3 self and L3 learning experience (see Figure 7 below). The first two constituents of this concept – ideal L3 self, ought-to L3 – are based on the students' future-oriented self-guides towards L3. Both of them are developed from different forms of integrations (international posture, which is "a construct to describe attributes toward an international community, readiness to work overseas, openness toward different cultural groups, and interest in foreign affairs" (Yashima, 2019, p. 208) and external regulation, known as type of extrinsic motivation derived from external factors as threats or rewards (Dörnyei, 2009) respectively). The last component, L3 learning experience, is established on the students' L3 self-confidence, which can be observed further in Figure 8.

Figure 7. *L3 Motivational Self System in defining factors underlying L3 WTC in STEM subjects*



The emergence of international posture in Kazakhstani context is explained by the lack of an English language environment in the area. Considering the widespread use of English outside the country, all interviewees opined that English would be beneficial only for those who plan to study overseas. This can be highlighted in the following comments made by Participant 8 and 9:

> It will be helpful for those who want to study abroad or go somewhere. Moreover, if you do not know French or Spanish, you can communicate with others through English there. (Participant 8, 2019).

> I am going to study in medical universities therefore for me it is very important to understand biology and chemistry. If I miss one class or do not understand the topic. I could not understand further because all topics are connected. As the medical university I like is abroad I need English. (Participant 9, 2019)

These comments disclose that the students' integrative motives of studying abroad, namely international posture, affect their willingness to contract the discrepancy between their own Actual and Ideal L3 selves. Moreover, the respondents also considered future career benefits in learning through English. One participant commented: "It is important to study STEM subjects in English, because English is a global language and most companies and employers prefer to hire English speaking workers" (Participant 6, 2019)

The change of LOI in STEM subjects implies the alteration in the form of examinations for the rest of the school time period for senior students. Thus, students indicated their willingness to not fail on the completion of the ongoing tasks in English as an important aspect of their motivation. In this regard, participant 1 said:

> … when a teacher explains the Past Simple in English, for example, it is important to understand and remember it, otherwise we will fail to complete tasks. It is the same in STEM classes. Therefore, if I do not know the topic firstly I ask peers, and then only ask a teacher. (2019)

This kind of students' motives in LMSS model emerged from external sources such as rewards or threats relate to ought-to L3 self, particularly, to the form of its external regulations. Motivated by the external regulations the students asked both teacher and peers for a better understanding of the topic as shown in the above extract. Most students stated that the choice of the language mainly depended on the language of the communication at that moment. Participant 5 explained this point, stating that "I always try to ask questions. But the language I usually choose to ask depends on what language people speak in class" (2019).

However, the comprehension of the task during the examinations, as affirmed by one of the participants, was difficult and being in stressful situations, he opted to inquire in Russian to have a firm grasp of the task. Echoing this point, participant 10 indicated that:

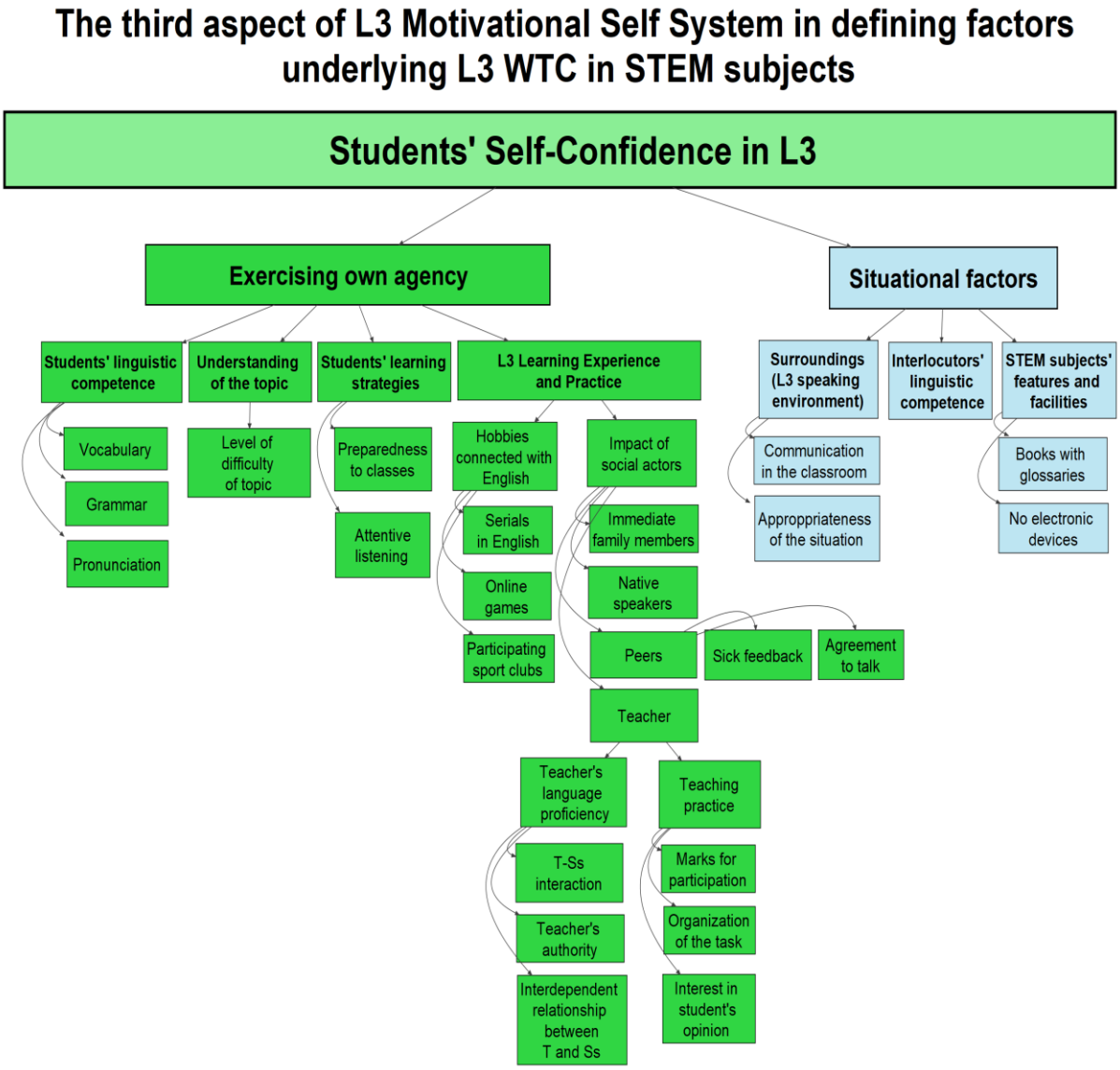
> We had individual works as a part of exams (срезы) which usually in English. Doing them I felt uncertain myself. We needed to know the terminology in both languages and do tasks. It was really stressful for me. To understand these tasks better I could ask a teacher in Russian. (2019).

To sum up, the students' vision of themselves either ideal L3 self or ought-to L3 affects their attitude towards new LOI and the choice of the language for communication.

The third aspect of L3 Motivational Self System in defining factors underlying L3 WTC in STEM subjects. An inquiry into the students' L3 learning experiences as the factors underlying participants' L3WTC unveiled that the phenomenon of self-confidence in L3 takes

a central place for students. According to the students' explication of their self-confidence in L3, this phenomenon is changeable and dependent on various conditions and factors. Those special conditions were analyzed and conjoined into two broad sub-themes: exercising one's own agency and situational factors (see Figure 8).

Figure 8. *The third aspect of L3 Motivational Self System in defining factors underlying L3 WTC in STEM subjects*



Exercising One's Own Agency. One of the broadly discussed sub-themes relates to the language aspect, in particular, what affects the advancement of L3 and productivity in

STEM subjects through students exercising their own agency. Within the scope of this paper the notion – exercising agency – is accepted as "a belief that (one's) behavior can make difference to (one's) learning in that setting" (Mercer, 2012, p.41). The following extract taken from participant 3's interview can exemplify this point: "The teacher can only affect the learning process, but our WTC in English I think it mostly depends on us and what we do for that" (2019).

The first frequently mentioned aspect which was connected with participants' confidence was their own level of English proficiency. Students faced challenges with the acquisition of specialized vocabulary or "…special terminologies, in the way how to pronounce and write them" (Participant 10, 2019) and general vocabulary "there are some cases when I do not know the words in English and I just speak in Russian. In STEM there were some difficulties, but usually we used translators" (Participant 9, 2019). Grammar was also alluded to three participants: "in general, I feel more willing to speak in English when I know the topic and I know how to form my speech correctly" (Participant 3, 2019). Six participants felt that they should improve their skills in such areas as English vocabulary, grammar, and pronunciation for lifting own confidence

The second participant's remark towards increasing their in-class WTC in English referred to the comprehension of the topic. This can be illustrated in the comment below: "… when I understand the topic of the lesson, I feel most prepared to communicate in English. I know how to speak in English; I just need to understand what to talk about" (Participant 5, 2019)

Moreover, eight participants added that if the topic of the lesson was discussed earlier in other subjects and they understood those topics, they would feel more open to share their own opinion in English. In addition, Participant 6 stated that topic enticement and the

easiness of the topic for understanding positively influenced his involvement in in-class communication. Participant 6 stated that:

> I can say that an interesting topic can increase my intention to speak in English. For example, gravitational forces of Earth. This topic is not tedious and it does not have difficult formulas. ...But if the topic is difficult I just learn it on my own at home and I do not discuss it in class. Easy topics I can learn at home and talk about them at the lesson. (2019).

Based on the significance of understanding the topic, another point emerged. It included their learning strategies for better acquisition of the content and practice of language in science classes. Examples of these strategies were participants' preparedness for further discussion of the topic in the class and attentive listening for better acquisition of a new topic. The following comments taken from the interviews of participants 6 and 8 depicted their learning approaches:

> When I am ready for the lesson, I have ideas to share. Because usually while doing home tasks, I am practicing, so I became more ready to speak in the classroom. (Participant 8, 2019).

> There are also shy students, they do not talk in class but more prefer listening. By that they understand the topic better. For example, when I just listen during the lesson and prepare at home and I will be ready for summative assessments. So, there are different approaches to studying. Someone loves to be stars, but others study for themselves and know everything better than others. (Participant 6, 2019).

It was also noticed that being experienced in L3 through different activities and constant practice make students feel confident in their own L3 speech, as presented in the

response of Participant 6: "it is not scary for me to make mistake in speech as I have experience studying through English from the 6th grade" (2019). Data analysis revealed two approaches in gaining experience and practice in L3 among students. The first one referred to hobbies in English reinforcing WTC in L3, while the second one highlighted the impact of social actors.

The use of English as a main language in a variety of sources of entertainment made students' exposure to English accessible. Moreover, it was noticed some effectual features of these leisure pursuits keeping participants willing to learn English. First, comparing to complicated and not engaging topics at school, leisure activities such as English films and serials kept students engrossed in a series of events and willing to understand what was happening there as described by Participant 9:

> …when I watch serials in English, I want to learn English because I want to understand what is happening in the serial. But during the lesson, when I do not understand the topic, I become less and less willing to learn English, I simply want to have the lesson finished earlier. (2019).

The second characteristic of the participants' leisure activities was that they required communication in English as mentioned by Participant 5: "…I often have to communicate with English-speaking people and give some kind of information. And basically just talk with them" (2019). Participant 6, who was a basketball player participating in world games and watching basketball live streams, shared how he used English in communication with peers: "When I am with my friends I just shout the words of the referees and this helps us to start to talk in English" (2019). By being involved in these activities many participants developed their language competence and interest in English.

Moreover, it was disclosed a profound influence of social actors such as immediate family members and native speakers, peers and teachers on students' exercising their own agency. Four out of ten interviewees highlighted the positive effect of their family members like sisters and mother on their L3 WTC. One participant stated: "My confidence in English is thanks to my sister. She studied in the USA and taught English then. So, I practice my English with her" (Participant 9, 2019). However, the participants' approach to native speakers differed. Participant 6, for instance, claimed that his motivation to speak in English increased due to his English native-speaking teacher: "When a native speaker started teaching in the language club I always wanted to answer her questions and show that I can reply regardless of the difficulties of those questions"(2019). An opposite situation was described by participant 5 who tended to communicate with native speakers through online games: "I feel I may not understand the context because of the slangs, unknown or shortened words, and the pronunciation also can be difficult to understand" (2019). He was aware of the difficulties of communication with native speakers.

Regarding the mediating role of social agents like peers in exercising participants' own agency in STEM subjects, it was found that five participants inclined to interact more with teachers as they believed that their classmates' level of English proficiency was not very good. In other words, students avoided sick feedback from peers. This notion was made clear by Participant 4 when he pointed out that: "If I don't understand something, then I will be more inclined to ask the teacher, because everyone in the class has a low level of English" (2019). Moreover, regarding the communication in English with peers, students viewed it as unnatural and embarrassing due to difficulty in delivering ideas or opinion properly. Even though a quote from Participant 10 showed that on the way of initiating interaction in L3 students can make an agreement to communicate in L3 outside of the school which will work far better than someone trying to do it his own: "If all of us decide to speak in English after

classes, it is ok. But I think it means nothing if somebody starts to do it on his own."(2019) Thus, half of participants underestimate their peers' knowledge of English and only their collaboration for language improvement purposes could enable them to learn to value each other's impact.

In order to understand both mediating role of teachers and their influence on participants' way of exercising their own agency in L3, one interview question was posed to them: To what extent can the teacher's role in the class help or decrease your WTC in English? The responses were organized into two groups: teacher's language proficiency and teaching practice.

Replies from the first group revealed that a teacher's use of English influenced students' intention to communicate in English, as in this comment: "If a teacher speaks in English it affects us. In a language club I speak through the whole lesson in English. But in STEM classes we probably speak only 5% in English" (Participant 7, 2019). However, a comment below could bring more insights:

> At first it was difficult to talk in English in Biology classes but then we got used to speaking in English while talking with the teacher but while talking with peers we used Kazakh if it was difficult to understand. We sometimes speak in Kazakh or Russian with our friends in ICT classes, but we need to talk in English with the teacher (Participant 1, 2019).

First, teachers have authority which influences participants' choice of language for teacher and student interaction. Second, this kind of teacher's influence could not affect the choice of language for interaction between students. Another interesting remark showed that L3 interaction between students and the teacher in STEM classes is of an interdependent nature:

> It depends on how prepared for the lesson the teacher is and on the support from our side because he is also studying English and he also has difficulties, therefore, we should also help the teacher and say encouraging words like "you are good". By that, he would feel more confident. But if he is uncommunicative and reserved he couldn't do that and, consequently, he wouldn't succeed and we also wouldn't succeed. We would start to be noisy, become stupefied, do nothing and just stop studying. (Participant 6, 2019).

It is apparent that an acquisition of a new language for both of them makes their relationship more interdependent. All in all, a teacher's linguistic competence played an important role, but it only influenced the interaction between teacher and student, moreover, two participants understood the fact that this relationship was interdependent.

The second group of responses shared information about three teaching practices affecting their L3 WTC. The first one related to the organization of the tasks. Receiving tasks with clear instructions, students can apply these for interaction with each other. Otherwise, students did not start to interact in English voluntarily as they were not confident in their English, which could be seen in this response:

> I feel that I could never converse in English in an appropriate manner, probably I could do that in written form, but not orally. It could probably happen if we were given a clear task to do that. But it could not happen on my free will. (Participant 10, 2019)

According to the second response, a teacher's assessment and the absence of the alternative to speak in another language affected students' WTC in English, as stated here: "What influences me to talk in English are two things: marks and despair of not having the choice to not to speak. In any case I need to speak" (Participant 9, 2019). Lastly, one

participant mentioned that the teacher's interest in their opinion increased the interaction between student and teacher: "I become more willing to speak when the teacher is really interested in listening to my opinion or converse with some of my classmates" (Participant 2, 2019). Teaching practices including the proper organization of the tasks and marks for participation, interest from teacher's side to student's opinion positively affect learners' engagement with L3 communication and this will be further discussed in the next chapter.

Summarizing all students' responses related to students' exercising their own agency, there are several aspects that students defined as the ones that positively influencing their L3 WTC. They are the improvement of their own linguistic competence, their comprehension of the topic, learning strategies, interaction with the members of their nuclear family, and their involvement in leisure activities. Peers, native speakers and teachers could also positively influence students' L3 interaction in certain conditions: if peers could agree to communicate in English, if native speakers could be teachers, if teachers could stimulate an interaction between teacher and student and could apply more suitable teaching practices.

Situational factors. The second sub-theme revealing another branch of factors influencing students' L3 WTC in STEM subjects covers situational factors including four parts: interlocutors' linguistic competence and L3 speaking environment/surrounding, and specific features of the subjects.

Interlocutors' linguistic competence is accepted by students as an important situational factor. Students preferred communicating with the interlocutors at the same level of language proficiency as theirs, as disclosed in this comment: "If I speak with a person knowing English, it will be easy. But, if the person doesn't know, it won't work out, as we will be constantly translating" (Participant 4, 2019). Moreover, relatively advanced level of English proficiency of interlocutors compared to the students makes the latter ones feel

ashamed, which is depicted here: "If I talk with a foreigner or person knowing English far better than me, I will be ashamed of my mistakes" (Participant 10, 2019). Thus, the students feel comfortable and more willing to engage in L3 communication with interlocutors at the same level of proficiency.

Another ever-changing factor is learners' surroundings. Starting with communication in the classroom, interviewees claimed that the mostly favorable classroom situation was when the whole classroom was engaged in L3 communication. Through this, they feel safe and confident unlike the situation when they are speaking in front of the audience. This is displayed here: "If there is interaction between all students or even majority in the classroom, I want to communicate. If only a few students talk, I do not start to speak English" (Participant 10, 2019). The response of participant 2 also signified the role of the surroundings through the comparison of his own behavior and intention for L3 communication in both a language club and STEM classes: "I go to additional courses of English and in whole lessons I can speak only in English. But at school I become easily confused about whether to speak English or not" (2019). This means that there are a lot of things that school teachers should learn from the language club to boost in-class communication. This will be discussed in the next chapter with further implications. Overall, as stated by Participant 8, "the surroundings, particularly, how you feel in the society", therefore, the creation of comfortable conditions for L3 communication in the classroom is essential for students (2019).

Students also noted that the surroundings predetermine the appropriateness of the situation for speaking in English or not. Students feel whether "this is not appropriate to say or, on the contrary, this will be perfectly said" (Participant 3, 2019), depending on the situation. One respondent shared an example of how this understanding could help them:

> Shyness as a result of being afraid of saying something wrong sometimes could save someone from saying a bad thing. For example, the students of the 9th and 10th grades are getting used to using foul language in English, you know, if you were in America once, you would definitely have this habit. (Participant 6, 2019)

In contrast to this situation, another participant described how an appropriateness of the English speaking situation and a need to speak in English increase students' L3 WTC: "If I want to speak English, then I will speak it. Depending on my willingness or whether it is required to speak English. If the whole class begins to speak English, and not pull out any words in Russian" (Participant 5, 2019)

Another factor pinpoints that the specific features of the subjects are essential in understanding whether it requires communication in L3 or not, as mentioned below:

> It depends on what subject it is, for example, mathematics. Here you just need to understand mathematics, rather than speak English. Maybe some additional classes can be taught in English, like computer science. In previous school I participated in those classes. I liked them. (Participant 5, 2019)

Moreover, students pointed out the necessity of having textbooks with glossaries or "books with translations of the words at the end" (Participant 4, 2019) and the destructive effect of electronic devices either in or outside the class, which is stated below:

> … I think mobile phones can affect us because we are sitting day and night on the phone. You know, when we are free, we pick up the phone and spend a lot of time on it. Instead of doing that we could read the books and practice English but we do not do that because of phones. Mobile phone also detracts from the lesson also

> because we look at the phone so often to know when the lesson finishes and other things. (Participant 1, 2019)

To sum up, specific features of the subjects and non-destructive in-class facilities are defined as strong factors influencing learner's L3 WTC in science classes. Moreover, in-class English communicative situations and the same linguistic competences of interlocutors also positively influence students' L3 WTC.

Summary

In conclusion, this chapter aimed to present the findings on the level of senior students` L3 WTC in STEM subjects and the factors influencing this which were collected from the questionnaire and interviews. The findings indicate that the learners' level of L3 WTC in STEM subjects is below average as their level of confidence, topic enticement and situational context are significantly low. Regarding the factors underlying students' L3 WTC in STEM subjects, it was found that their future-oriented self-guides (ideal L3 self and ought-to L3 self) and self-confidence play an essential role for them. The students' future-oriented self-guides are based on their international posture and external regulations, while their self-confidence depends on students' exercising their own agency, and situational factors. These findings will be further explained with reference to the empirical literature in the subsequent chapter.

Chapter 5: Discussion

The purpose of this chapter is to compare and contrast the findings indicated in the prior chapter with reference to the theoretical framework adopted in the present study and presented in the literature review chapter. As repeatedly mentioned, the present study adopted a mixed methods approach to investigate the level of Kazakhstani students' WTC in English in senior secondary STEM subjects and the essential factors that affect their L3 WTC. To attain this goal, answers to the two following questions were sought in this thesis:

1) What is the level of participants' WTC in English in senior secondary STEM subjects?

2) What influences these participants' WTC in English?

The discussion of the findings is organized into two sections pursuant to research questions. In the first section, the participants' level of WTC in L3 in science subjects in terms of their confidence, topic enticement, learning responsibilities and situational context are discussed. The second section is dedicated to explain what influence students' WTC in STEM subjects drawn on Dörnyei's (2009) model of 'L2 motivational self system' (LMSS)

RQ1. What is the level of participants' WTC in English in senior secondary STEM subjects?

Overall portrayal of quantitative part of the findings revealed that despite high levels of learning responsibilities among students, other variables of L3 WTC like confidence, topic enticement and the situational context were more negatively rated. This information allows me to answer the first research question by stating that the Kazakhstani students' level of L3 WTC in STEM subjects tends to be below average. The data collected from the above-mentioned variables are discussed further.

Closer look at students' responses on the statements referring to confidence (see Figure 3 in Chapter 4) and situational context (see Figure 4 in Chapter 4) revealed the similar patterns. First, students avoided speaking in their L3, English, when they needed to stand in front of the audience by attracting others' attention. This was depicted in their highly negative responded statements related to both a) confidence - "I give a presentation in English in STEM classes in front of my classmates" and b) situational context – "I speak more in English in STEM classes when I am sitting in the front of the class". Second, students were concerned about their preparedness to provide the right answer and correctness of their speech. It was supported by their positively responded statements of both: confidence - "I speak in English in STEM classes when I know the correct answer" and situational context – "I speak more in English in STEM classes when I know exactly what has to be done". Moreover, according to the interview results, students explained their unwillingness to give a speech in L3 due to their insufficient English speaking proficiency which expounds the importance of correctness for Kazakhstani students. It became apparent that students were reluctant to speak in L3 in public, moreover, they were worried about being prepared and knowing how to provide the linguistically correct response.

Such findings seem to be in line with some previous research conducted in Asia (Wen & Clément, 2003 in China; Prihartanti, 2017 in Indonesia; Riasati, 2018 in Iran). In explanation of students' reticence, Wen and Clement (2003) emanated from a cultural point, namely face-protective orientation in Chinese culture. Due to the inseparability of Chinese people's selves from others, they were mindful of what other people in their surrounding could think about them and evaluate their English level (Wen & Clement, 2003, p.20). Therefore, if Asian students were not sure of the correctness of their responses in terms of grammar and pronunciation they often chose to remain silent for face-saving purposes (Brick & Louie, 1994; Jung, 2011; Riasati, 2012). Furthermore, Wen and Clement (2003, p.25)

pinpointed that their Chinese participants' WTC in English largely depended on their effective preparedness to engage in FL communication. This issue may also explain the reasons that affected many Kazakhstani students' unwillingness to communicate in public in English.

Regarding the topical enticement (see Figure 5 in Chapter 4), it was revealed in the current study that the involvement in whole class discussion for brainstorming or conversation about the recently learned material did not boost one's intention to integrate into L3 communication, whereas the topic students found as an interesting one positively affects. It explains that the familiarity with science topics does not significantly affect Kazakhstani students' WTC, but topic interest has more positive impact. However, the findings of some prior studies (e.g., Basöz & Erten, 2019; Cao & Philp, 2006; Kang, 2005) revealed that both students' familiarity with topic and interest in topic had a noticeable impact on one's WTC in English. As clarification of such distinctions between findings, it should be reminded that science topics and everyday topics or topics of language classes differentiate in terms of complexity. Thus, the interest in the discussed topic makes students involved in English language interaction.

Referring to the learning responsibility (see Figure 6 in Chapter 4), most of the statements were positively responded to by indicating a high level of students' awareness of their learning responsibility. Most positive responded statements referred to asking peers about correct pronunciation and grammar, and communicating in English when the participation is being graded. According to Peng and Woodrow (2010), students' openness to help each other or their cohesiveness is an essential factor in the construction classroom atmosphere which influences students' in-class WTC in English. Additionally, the cohesiveness of participants of Amalia, Asib&Marmanto's (2019) study made them

psychologically closer which further affects their learning behavior and sense of learning responsibility. Regarding the grading, Riasati's (2012) investigation of WTC of Iranian EFL learners of different fields of study showed that students had controversial views. One group of students believed that scores could indicate one's speaking ability and increase sense of motivation, while others accepted grading as a stressful activity preventing from demonstration of the learners' full potential.

Overall, the findings of the current study suggest that Kazakhstani STEM students were reluctant to speak in public for face-saving reasons and concerned a lot about linguistic correctness of their speech and preparedness to the task as majority Asian students. This largely impeded most participants' in-class L3 communication. However, the sense of learning responsibility among students was moderately higher than other variables which positively affected the classroom environment. Qualitative data gathered from participants responses also justified that students' learning responsibilities play important role in educating through L3 and it appeared to be mainly driven by their future-oriented self-guides and learning experiences if L3. The discussion of these aspects is provided further in deliberation of RQ2. Moreover, it was also noticed that STEM students' readiness to discuss topics of their interest in English positively influenced their L3 WTC.

RQ 2: What influences these participants' WTC in English?

To respond to this question, 10 STEM students of one of the secondary school in Nur-Sultan were interviewed. Almost all participants affirmed that their language learning motivation played a key role in their WTC in English, however it had a variety of dimensions. The findings of the present study in relation to this research question can be addressed with reference to Dörnyei's (2009) model of 'L2 motivational self system' (LMSS) which components were changed to the L3 context in this study: students' future-oriented self-

guides towards L3 (ideal L3 self, ought-to L3 self) and L3 learning experience (see Figure 7 in Chapter 4). In this study, STEM students' L3 future-oriented self-guides (future-selves) were principally developed on the basis of one of the motivational orientation, namely, *international posture*, which is "a construct to describe attributes toward an international community, readiness to work overseas, openness toward different cultural groups, and interest in foreign affairs" (Yashima, 2019, p. 208), together with *external regulation*, known as type of extrinsic motivation derived from external factors as threats or rewards (Dörnyei, 2009) respectively). The last component, L3 learning experience, is established on the students' L3 self-confidence, which essentially relied on students' exercising of their own agency e.g. "the human capacity to act on informed choices" (Benson and Cooker, 2013, p. 7), and situational factors (see in Figure 8 in Chapter 4).

Many previous studies recognized that language learners' motivation was identified with their L2 WTC (Altiner, 2018; Munezane, 2014; Peng, 2007). Nevertheless, the Asian studies applying motivation concepts to research WTC are of particular interest. For instance, Khajavy et al.'s (2016) investigation of Iranian EFL students revealed that students having positive attitudes toward learning English as a L2 easily became motivated to learn it which further increased their communicative competence (i.e. by lowering L2 anxiety) and L2 in-class WTC. Another study pursued in Iranian EFL context, Teimouri (2017), among high school students used both motivation and emotion concepts in WTC research. The findings of that study indicated that Ideal L2 self was a direct predictor L2 WTC, whereas Ought-to-L2 self was not. Moreover, Ideal and Ought-to-L2 selves were determinants of joy, while Ought-to-L2 Self predetermined anxiety and shame. L2 learning experience is also integral element in WTC as motivation (key predictor of WTC) originated from learners past and current positive L2-related experiences directly affecting the development of both L2 future-selves (Lamb, 2012; Olsen, 2017; Ushioda, 2009). Overall, these findings showed congruity in

application of motivational concepts in investigation of WTC, however, most previous studies adopted Dörnyei's framework to explore participants' WTC in English as a second rather than as third language, as it is in the present study.

Regarding the motivational constituents, the findings of the present study displayed the significance of international posture, external regulation and self-confidence for STEM students. Despite some empirical investigations in Asia like Matsuoka (2005), Yashima, Zenuk-Nishide and Shimizu (2004) which revealed high correlation between International posture and WTC, other studies (Courtney, 2008; Lamb, 2004; Zeng, 2010) did not report interrelation between them. The main reason for that was in the diversity of ethnolinguistic contexts (Platsidou, Kantaridou, &Papadopoulou, 2017). In Kazakhstan as revealed in the current study, international posture was found to be influential, particularly in the form of the students' interest in vocational activities, which represented their intention to work and study abroad. Moreover, this study revealed that external regulations as examinations also contributed to constructing students' intention and willingness to learn English. This finding concurs with Kyriacou and Zhu's (2008) study reporting that the senior high school students in China were mainly motivated to learn English by external reasons, such as passing examinations, entering educational institutes abroad and following career prospects (p.100).

Another important aspect of learners' motivation was their language learning experiences as revealed in the current study. Pursuant to the findings, STEM students' L3 learning experience was correlated with their self-confidence in L3, which, in turn, was highly dependent on students' exercising their own agency and situational factors. Earlier research (Bamfield, 2014; Bursali, 2019; Cao, 2011; Riasati, 2012) also appointed the interrelation between learners' language experiences and their self-confidence. On the one side, to gain confidence in oral interaction in FL learners needed to practice regularly experiencing certain

embarrassing situations in the use of FL and, by this, learning how to do right (Bamfield, 2014). Thus, through the experience learners became self-confident in FL. On the other side, the students with high level of self-confidence displayed higher levels of motivation and intention to experience new structures in FL, and less level of anxiety to make errors in their speech (Fallah 2014; Öz, Demirezen, &Pourfeiz, 2015). This explains the interdependence between students' self-confidence in L3 and L3 learning experience.

The findings of the current study presented that learners' self-confidence significantly hinged on the way students exercised their own agency and situational factors in STEM classrooms affected that. Students' agency in this study was not only accepted as "the individual's influence over his/her particular situation" (Rowland, 2011, p. 435), but more as an action mediated by contextual conditions (Gao, 2010; van Lier, 2008). This can be explained by the fact that the language learning process itself occurs within the certain context providing learners with conditions to act from their choice (Huang, 2009). Thus, students' action to master L3 and conditions in the STEM classroom incorporated their self-confidence in L3.

One part of findings revealing STEM students' vision of exercising their own agency emphasized the importance of developing students' own linguistic competences, learning strategies such as their preparedness for discussion of the topic and attentive listening for better understanding the topic, and selecting simplistic topics for discussion. All of this lifted students' confidence in L3 in STEM subjects.

Starting with linguistic competence, it should be reminded that the language in STEM classes is content-specific, therefore, students faced challenges in pronunciation and usage of terms. This finding seems to be compatible with Rockafellow's (2016) study of international science students in the USA which revealed that STEM students due to linguistic

challenges had difficulties in comprehension tasks in assignments and completing them in a given timeframe, understanding rapid speech while taking notes and communicating with teachers and peers. Moreover, Chang (2018) found out that students being unfamiliar with key phrases faced challenges in structuring sentences during the interaction which was in line with the result of the current study. Thus, these findings showed that students needed to acquire content-specific terminology and reached a particular 'threshold' level of communicative competence in order to be able to operate in a FL effectively. This can also help students to comprehend an essential contextual background of a subject and further apply the gained knowledge.

This study also confirms the findings of prior research, indicating that the discussion topics have an impact on students' WTC (e.g., Bamfield, 2014, Cao & Philp, 2006; Zarrinabadi, 2014). It was found that the more simplistic topics, the higher level of students' self-confidence, while complicated ones decrease their intention to talk in FL. On account of the strategies the participants of this study applied, preparedness to classes and attentive listening rather than speaking during the lesson, they strongly correlated with the 'face-saving' approach of Asian students (Jung, 2011; Shao & Gao, 2016). Students' endeavor to be prepared for classes could be linked to their fear of losing face in public by being labeled as unsuccessful students not studying hard enough as echoed in Hsu's (2015) research of Taiwanese EFL students. When studying a new topic, some students opted to stay silent and just listen as revealed in this study. Apart from being afraid to make mistakes, participants of the present study explained that the examinations later would not be requiring their communicative skills. This means that to affect students' WTC, the assessment should be designed accordingly.

Mercer (2012) claimed that for exercising students' agency there are "series of multiple, interconnected causes which can interact in unpredictable ways and can vary in their relative significance" (p.44). It was also found to be true in this study as the participants' experiences and practices of L3 communication gained through interaction with social actors and involvement in leisure activities made them feel confident in English further in STEM subjects. In other words, students were able to bring their language skills learnt outside the classroom and use them in STEM classes.

The leisure activities revealed in this study (watching serials, involvement in sport activities and playing online games) were characterized by features influencing the participants' WTC in English. They were that these activities: a) kept students involved which lowered their language anxiety similar to Reinders and Wattana's (2015) findings; b) required real communication in English (e.g., online games, sport activities); c) kept willing to understand English for better comprehension of the context which needed unconscious application of guessing or compensation strategy (Rebecca, 1990) (watching serials). It was also found that students involved in real communication with native speakers had difficulties in communication as there were many unknown words and slangs. Overall, being involved in these activities students developed language competence and interest in English. Thus, there is a point of thinking about how to account these features and bring them into the classroom through the use of technology and considerations of mixed ability groups as the students' preferred ways of receiving information (Gardner & Hatch, 1989) are always differ (visuals preferring visualizing, kinaesthetics enjoying hands-on activities and sports).

Among social actors who enhanced students' sense of agency in this study were immediate family members and native speakers, peers and teachers. In order to improve their own competence, STEM students were highly motivated to communicate in English with

their family members who know English well (mothers and older sisters). Interestingly, the same was noticed among UAE (United Arab Emirates) university students in Palfreyman's (2006) study. Arab university participants in Palfreyman's (2006) study reported that their family members contributed to their learning by offering encouragement, support, and practice in learning FL. The present study with Kazakhstani secondary students echoed the same finding.

However, regarding peers, the findings indicated that STEM students underestimate their peers' knowledge of English and only their collaboration for language improvement purposes could change it. This phenomenon was supported by Jung (2011), Léger and Storch (2009), MacDonald, Clément and MacIntyre (2003) in terms of students' belief that interaction in FL is unauthentic and awkward compared to their communication with peers in L1. Yet, Kazakhstani students, as exemplified in the findings of the current research, alluded to the idea that a safe environment co-constructed with peers where they could not worry about mistakes and could receive support to increase L3 WTC. This idea was also shared with Korean counterparts in Jung's (2011) study.

On account of native speakers, Kazakhstani students developed two kinds of views. First, interaction with native speakers could bring difficulties in the comprehension of the context due to unknown words and slang. Therefore, one student believed that communicating with the individuals sharing the same L1 the student could receive more support in case of need. This tendency was also noticed in Medgyes (1992) and Kassing (1997) studies, which pointed that interlocutors from the same cultural group considered as a valuable source in FL learning due to the possibility to provide in-depth knowledge understanding the nuances of both L1 and L2 (cited in Jung, 2011). Second, Kazakhstani students with high English proficiency level in the current study believed that communication with native speakers,

namely teachers, increased their L3 WTC. Bekleyen's (2004) and Weaver's (2010) studies disclosed that interaction with native speakers in the classroom for learners with comparatively high level of English proficiency provide a significant amount of space for practice and development of cultural awareness.

In this study, participants emphasized on both teachers' language proficiency and teaching practices. High prioritization of teachers' linguistic competence in English for STEM students could be explained by the recent transformation of Kazakhstani educational policy to trilingual approach. The practice of teaching and learning STEM through English is at its initial stage in Kazakhstan (MoES, 2016) and participants are accepting their STEM teacher teaching through English medium of instruction which is different from prior years of learning as models. This explains why those teachers' authority was proved to be high for STEM students, moreover, it influenced teacher and student interaction. Interestingly, participants demonstrated an awareness of the fact that their STEM teachers were also learners of English as they are. Thus, participants were convinced that teachers need encouragement from their side while speaking in English. Doing this, teachers could be more confident to deliver their own lesson and students, in their turn, would also benefit from that by better acquiring content and language. Despite this illustrated interdependent relationship between teacher and students, it also reveals students' understanding of their responsibility taking action and exercising their own agency in L3 classroom settings.

The findings are also compatible with the previous ones (Bursalı, 2019; Eddy-U, 2015; Myers and Claus 2012) as they highlighted that students' FL communicative behavior in the classroom was affected by teaching style and practices including teacher's communication with the students, marks for participation, and design of communicative tasks. Myers and Claus (2012) stated that students became interested in the involvement in

communicative classroom activities to receive good marks for participation. Together with marks receiving, Eddy-U's (2015) findings emphasized the students' perceived effectiveness of the task for their in-class WTC. Moreover, Bursali (2019) postulated that proper and efficient organization of the tasks not only affected students' perception of usefulness of the task but also increased their communicative confidence and interest. A bulk of studies (e.g., Bamfield, 2014; Cao, 2011; Goodboy, Myers, &Bolkan, 2010; İlter, 2018; Peng, 2012) contend that teachers' supportive and friendly approach towards students positively affected students' engagement in class activities and discussions in FL. Considering this, as pedagogical implication here could be the development of rapport between the teacher and the students, more attention should be paid to assessment criteria and task design.

Among situational variables, classroom environment/L3 speaking surrounding was found to be influential one for students' L3 WTC in the instructional context, likewise in Peng and Woodrow's (2010) and Joe, Hiver, and Al-Hoorie's (2017) studies. Moreover, Bamfield (2014) applied a notion of "group cohesiveness" referring to the classroom climate which differed in a high form where there was an "active engagement due to pleasurable communicative experiences resulting in high levels of WTC" and low form characterized as "a lack of intention to engage verbally due to heightened language anxiety resulting in an un-WTC"(p.54). This explains the high correlation between WTC and FL speaking environments. Considering this, Shen and Byfield (2018) advised to apply a variety of strategies, first, creating inclusive environment which would engage all students in FL communication and, second, connecting content and students' identities at local level, which contribute to the development of a higher-level of thinking and students' involvement in classroom activities.

As Dornyei (2002) alleged that language learners motivation is co-constructed during the interaction of interlocutors (cited in Shen & Byfield, 2018), the results of this study showed the importance of interlocutors' language competences as situational factors for L3 WTC. Participants shared that it was desirable to have an interlocutor whose L3 proficiency was not much lower or much higher of the participant's own proficiency levels. This finding was recapitulated in a number of other studies(Bursalı, 2019; Eddy-U 2015; Riasati, 2012). Eddy-U (2015) appended that the discrepancy between interlocutors' language competences could make learners unmotivated and uninterested for further interaction.

Another spotted situational factor referred to the participants' concern for appropriateness of speaking in varied language contexts in order not to be ashamed because of saying something wrong while speaking. This kind of students' self-perception in earlier studies (Eddy-U, 2015; Zhong, 2013) was linked to the issue of fear of losing face which was known as a reason for East Asian students' reticence. This was also discussed earlier in the response for the first research question.

Corresponding to Williams, Mercer and Ryan's (2016) idea which pinpointed that WTC in FL might be influenced by anything happening in a particular situation/moment, collected data revealed certain aspects that expanded our understanding of STEM classroom communication. Findings showed that some participants believed that they should devote more attention to content in the subjects as mathematics for better concentration rather than language. This finding indicates that there was a difficulty between balancing language and content. The studies of Echevarría, Vogt, and Short (2016) and Coyle et al. (2010) stated that improvement of students' skills in both language and content can be reached by setting up learning objectives in both content and language. This implies the application of Krashen's comprehensible input (i+1) theory, pursuant to that content and language opted for learning

should be just above the students' current abilities (Echevarria et al., 2016). This could provide an avenue for better incorporation of content and language in STEM classes and students' perception of that.

Moreover, participants declared the necessity of textbooks with glossaries, which, as they believe, make a bridge between languages. In line with this, number of studies (Cárdenas-Hagan, Carlson, & Pollard-Durodola, 2007; Garcia, 2000; McCarthey&Zheng, 2010) emphasized that in order to raise metalinguistic awareness across the languages used in class, it should be not only translations provided, but also opportunities for switching between those languages, i.e. code-switching. This will help to minimize blocks of silence between learners and build their confidence in speaking (McCarthey & Zheng, 2010).

Although one of the findings illustrated that the elimination of destructive facilities as smart phones in the classroom, the recent studies (Aguskin & Maryani, 2018; San Isidro &Lasagabaster, 2020) proved that integration of digital technologies in learning process increases learners' motivation for practicing the language, and even helps learners to be more culturally connected by revealing the interconnection between languages and cultures.

As it can be seen above in the discussion of findings, a number of factors could influence STEM students' L3 WTC. International posture as part of the students' Ideal L3 Selves and external regulations as the constituent of Ought-to L3 Selves were perceived by students as strong predictors of their L3 WTC. Moreover, learner's L3 learning experiences, which facilitated their self-confidence in L3, played a major role in determining L3 WTC. On the one side, students' self-confidence in English was affected by exercising their own agency through working on own linguistic competencies, choosing easier topics for discussion, practicing with social actors like immediate family members, peers, native speakers, teachers and through engaging in various activities (hobbies) requiring English knowledge and

communication. On the other side, situational factors as interlocutors' linguistic proficiency, in-class communicative situation and specific features of STEM subjects were found to be influential for WTC of L3-speaking STEM learners.

Summary

This chapter discussed the results of this study by comparing and contrasting them to those in previous related research. This enabled the researcher of the present study to make a linkage between this research and previous ones, especially those conducted in Asian context, and thus a deeper understanding of the phenomenon under investigation was gained. As shown above, this chapter was organized according to two research questions. By discussing Asian students' reticence in the first subchapter, it was revealed that Kazakhstani students' level of WTC in English was below the average due to mainly face-saving reasons and their own concern on linguistic correctness of the speech as it was among many Asian students. The second one deliberated over the factors determining L3 WTC in science classes. Those factors revealed in this study indicated that the STEM students' L3 WTC was strongly influenced by international posture, external regulations and their L3 learning experiences. Analyses presented in this chapter are used further for pedagogical implications in the following Conclusions chapter.

Chapter 6: Conclusion

The central objective of this study was to determine the level of Kazakhstani students' WTC in English in senior secondary STEM subjects as well as the essential factors that affected their WTC in English. To attain these goals, the research problem, aim and questions were defined which further assisted in the disclosure of the most pertinent data facilitating the elucidation of a matter of peculiar interest through revision of theoretical and empirical literature, selection of expedient instruments, analysis and discussion of the data with provision of best possible ways on enhancing learners' WTC in English. The review of empirical studies in Asia context uncovered a considerable effect of learners' motivation and self-confidence on WTC in FL which also laid the groundwork for L3 WTC in this thesis. However, a lack of investigations of students' WTC in FL in content area classes raised the significance of conducting this study in Kazakhstani multilingual context. In addition, the exploration of prior literature revealed Khatib and Nourzadeh's (2015) and Peng's (2019) questionnaires of a high level of validity and reliability for measuring participants' level of WTC which were later adapted to Kazakhstani science subjects classroom realities and employed in this study. Combination of data coming from both closed-ended questionnaires and semi-structured individual interviews were thematically analyzed and discussed in consonance with the existing literature for indicating factors determining L3 WTC. This chapter presents the summary of the main findings, together with the limitations of this investigation and implications for practice and research.

Summary of Main Findings

Pursuant to the findings of the current study, Kazakhstani students' level of L3 WTC in STEM subjects is below average. Their reluctance to speak in public is mostly connected with face-saving reasons; moreover, students were concerned a lot about linguistic correctness

of their speech and preparedness to the task as the majority of Asian learners. This largely impeded most participants' L3 communication in the instructional context. Nevertheless, the sense of learning responsibility among students was moderately higher than other variables which positively affected the classroom environment and it was also noticed that STEM students' readiness to engage in English language communication to discuss topics of their interest positively influenced their L3 WTC. Moreover, it was also found a number of factors that played a major role in influencing STEM students' L3 WTC. They are 'international posture' as part of the students' Ideal L3 Selves, external regulations as the constituent of their Ought-to L3 Selves and learners' self-confidence in L3 interconnected with L3 learning experiences. During the semi-structured individual interviews with each participant, they highlighted that one of their strong predictors of their L3 WTC – self-confidence in L3 – was influenced by many other factors. On the one side, students' self-confidence in English was affected by exercising their own agency through working on own linguistic competencies, choosing easier topics for discussion, practicing with social actors like immediate family members, peers, native speakers, teachers and through engaging in various activities and hobbies requiring English knowledge and communication. On the other side, situational factors as interlocutors' linguistic proficiency, in-class communicative situation and specific features of STEM subjects were found to be influential for WTC of L3-speaking STEM learners.

Limitation of the Research

There are several limitations of the present study from the methodological standpoint. First, as the research site in the study was one of the urban mainstream schools of Nur-Sultan city, the inclusion of both urban and rural settings could demonstrate different findings in terms of motivational prospects of students and their learning behaviors. Thus, the

results might not be generalized beyond the context of urban settings. Second, the measurement of participants' level of WTC in English was conducted by a self-rating method in the questionnaire. Despite the opportunities of this method to reveal the students' self-perception of their communication in English, it could not fully gauge in-class L3 speaking precisely. Third, the list of data collection instruments of this study – semi-structured interviews and a questionnaire – could be expanded by adding observation as it might increase the validity and reliability of the data by acting as a tool for triangulation.

Implications for Practice

Results of the current study could bring a number of implications for STEM teachers in terms of language aspect. Findings suggest that (1) students' reticence in STEM classes is due to face-saving reasons; therefore, they concern a lot on linguistic correctness of their speech. Moreover, for this reason it is difficult for students to find a balance in giving more attention to content or language. Considering these points, there is a necessity of creating an inclusive environment for L3 communication where every learner is able to listen to others with respect, understanding that mistakes in L3 speaking are part of learning. Together with this, the application of Krashen's comprehensible input (i+1) theory, which implies that content and language selected for teaching need to be just above the learners' current abilities, could be beneficial for L3 teaching and learning in content-area classes. These two points highlight the importance of both communication and content for students. Findings also disclosed that (2) the effectiveness of the task is perceived by students as a significant aspect in learning as it needs to be engaging in L3 communication and challenging in terms of comprehension. This rationalizes the consideration of cognitive constituents of learning. In addition, one of the suggestive findings of this study is that (3) several students in informal settings with the help of digital technologies and English speaking interlocutors were able to

advance their own linguistic skills. It was explained by the fact that these activities kept them engaged and willing to understand English for better comprehension and required real communication in English. These features need to be brought into the classroom with the proper use of technology. For instance, exploring the celestial spheres, students could connect through Skype with counterparts from another country and share the stories and beliefs that people in their areas in the past had. This could help learners not only translate the stories they know to FL, but also learn about another culture. Besides the increase of participants' motivation for practicing the language, the advancement of technology enhanced the linkage between students' selves and new language, new culture, new world. This justifies a demand of both cultural aspects and digital technologies in the classroom. Summarizing main points, content, communication, cognition, and culture are essential for science students. An integration of these four aspects already works as a basement in CLIL teaching methodology which appeared in the mid 1990s to frame multifaceted FL experiences of students in classroom (Coyle, 2006). According to Marsh (2002), CLIL approach incorporates set of activities where FL is utilized as an instrument for studying a non-language subject and impact of both FL and subject is equally evaluated (p.58). Therefore, it is advisable to apply the CLIL approach for teaching and learning in STEM subjects. Moreover, one of the highlights of CLIL methodology is that it values all the languages in the students' repertoires and through a translanguaging-based approach (San Isidro, 2018) uses these languages to help learners to make meaning in the learning process. Wise use of the languages in students' repertoires, I believe, develops not only a motivational basis in L3 but it also cultivates their ideal multilingual selves.

Implications for Research

Despite the limitations mentioned above, I believe that the outcomes of this study are noteworthy as they provide voice to those stakeholders who are heard on rare occasions. Moreover, the study contributed to the researched field of WTC by exploring both the context of an unexplored Asian country (Kazakhstan) and the instructional setting of a content-area (STEM) classroom. As implication for further research brought by the current study is that with consideration of multilingual settings in Kazakhstan it is advised to investigate students' WTC through the perspectives of their ideal multilingual selves. First, it could bring more holistic approach in investigation of WTC in STEM classes through motivational perspectives and, second, it might assist in understanding the interplay of various language-driven motivational self-guides (namely, ideal multilingual selves) in the area which ultimately affects WTC in science classes. Regarding the methodological aspect, it is proposed to include both urban and rural settings to grasp a complete and in-depth picture of motivational intentions to speak in different languages in the instructional context in Kazakhstan. Another point to mention is that data collection tools, besides interviews, self-reports, could add non-participatory observations for gaining rich data.

References

Abdallah, S. A. A., & Ahmed, A. G. A. (2015). The impact of self-confidence on EFL Sudanese tertiary level students. *International Journal of Information Research and Review, 2*(09), 1093-1106. Retrieved from http://www.ijirr.com

Aguskin, L. C., &Maryani, M. (2018). Exploring the International Students' Perceptions of the Indonesian Teaching Materials to Enhance Their Willingness to Communicate. *Lingua Cultura, 12*(4), 323-331.doi: 10.21512/lc.v12i4.4910

Al Amrani, S. N. A. (2019). Communication and Affective Variables Influencing Omani EFL Learners' Willingness to Communicate. *Research in Applied Linguistics, 10*(1), 51-77. Retrieved from http://rals.scu.ac.ir/article_14179_0b9cea4e95f22eb2bac75ca8d5293e60.pdf

Ali, M. (2017). *Investigating Pakistani university students' level of willingness to communicate (WTC) in English as a foreign language: A case study of students from the Shah Abdul Latif University, Khairpur, Sindh (SALU)* (Doctoral dissertation). Northumbria University. Retrieved from http://nrl.northumbria.ac.uk/36296/

Al-Murtadha, M., & Feryok, A. (2017). Studying English in Yemen: situated unwillingness to communicate in sociohistorical time. *Innovation in Language Learning and Teaching, 11*(3), 230-240. doi:10.1080/17501229.2017.1317258

Alqahtani, M. (2015). Saudi Students' Willingness to Communicate and Success in Learning English as a Foreign Language. *Journal of Language Teaching and Research, 6*(6), 1195-1205. doi:10.17507/jltr.0606.06

Altiner, C. (2018). Turkish EFL Learners' Willingness to Communicate in L2 and Motivation. *Journal of Education and Training Studies*, *6*(11a), 181-185.

Amalia, S. N., Asib, A., &Marmanto, S. (2019). Indonesian EFL Learners' Willingness to Communicate in the Instructional Context. *Indonesian Journal of EFL and Linguistics*, *4*(2), 215-228. doi:10.11114/jets.v6i11a.3815

Anyadubalu, C. C. (2010). Self-efficacy, anxiety, and performance in the English language among middle-school students in English language program in Satri Si Suriyothai School, Bangkok. *International Journal of Human and Social Sciences*, 5(3), 193-198. doi:10.5281/zenodo.1056787

Asmalı, M., & Bilki, U., & Duban, C. A. (2015). A comparison of the Turkish and Romanian students' WTC and its affecting factors in English. *Journal of Language and Linguistic Studies, 11*(1), 59-74.). Retrieved from www.jlls.org

Ayazbayeva, N. (2017). *Language Policy, Ideology and Practice: Parents Views on the Trilingual Policy* (Doctoral dissertation). Available at Nazarbayev University Repository. Retrieved from http://nur.nu.edu.kz/handle/123456789/2573

Baidaulet T. , Basygaraye Zh., Mautenbaev A., Srail S., Ydyrys A., Ydyrys S. (2019) Training Biology in English Language in Kazakhstani Education. *Universal Journal of Educational Research*, 7(8), 1698-1706. doi: 10.13189/ujer.2019.0 70808

Bamfield, V. M. (2014). *Chinese Tertiary Students' Willingness to Communicate in English* (Doctoral dissertation). Available at De Montfort University e-theses. Retrieved from http://hdl.handle.net/2086/10125

Barkhuizen, G. (2014). Narrative research in language teaching and learning. *Language Teaching*, *47*(4), 450-466.doi: 10.1017/S0261444814000172

Barraclough, R. A., Christophel, D. M., & McCroskey, J. C. (1988). Willingness to communicate: A cross-cultural investigation. *Communication Research Reports*, *5*(2), 187-192. doi: 10.1080/08824098809359822

Basöz, T., & Erten, I. H. (2019). A Qualitative Inquiry into the Factors Influencing EFL Learners' In-Class Willingness to Communicate in English. *Novitas-ROYAL (Research on Youth and Language)*, *13*(1), 1-18. Retrieved from http://www.novitasroyal.org/Vol_13_1/1-268-%20Basoz%20and%20Erten.pdf

Bekleyen, N. (2004). The influence of teachers and peers on foreign language classroom anxiety. *DilDergisi* [Language Journal], (123), 49-66. Retrieved from http://dergiler.ankara.edu.tr/dergiler/27/745/9525.pdf

Benson, P., & Cooker, L. (2013). The social and the individual in applied linguistics research. In P. Benson, & L. Cooker, (Eds.), *The Applied linguistic individual: Sociocultural approaches to identity, agency and autonomy* (pp.1-16). Sheffield, UK: Equinox Publishing.

Bergil, A. S. (2016). The influence of willingness to communicate on overall speaking skills among EFL learners. *Procedia-Social and Behavioral Sciences, 232*, 177-187. Retrieved from www.sciencedirect.com

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. London, UK: Sage.

Brick, J., & Louie, G. (1984). *Language and culture – Vietnam: Background notes for teachers in the adult migrant education program.* Sydney, Australia: Adult Migrant Education Service

Burgoon, J. K. (1976). The unwillingness to communicate scale: Development and validation. *Communication Monographs, 4(*3), 60-69. https://doi.org/10.1080/03637757609375916

Burroughs, N. F., & Marie, V. (1990). Communication orientations of Micronesian and American students. *Communication Research Reports,* 7, 139-14. https://doi.org/10.1080/08824099009359868

Bursalı, N. (2019). *A Case Study on Willingness to Communicate in Learning English as a Foreign Language* (Master's thesis).Available at Yabancı Diller Eğitimi Bölümü Tez Koleksiyonu [Thesis Collection of Foreign Languages Education Department].Retrieved from http://hdl.handle.net/11655/8041

Cao, Y. (2011). Investigating situational willingness to communicate within second language classrooms from an ecological perspective. *System, 39,* 468- 479. https://doi.org/10.1016/j.system.2011.10.016

Cao, Y. (2014). A sociocognitive perspective on second language classroom willingness to communicate. *TESOL Quarterly*, *48*(4), 789-814. https://doi.org/10.1002/tesq.155

Cao, Y., & Philp J. (2006). Interactional Context and Willingness to Communicate: A Comparison of Behavior in Whole Class, Group and Dyadic Interaction. *System, 34*(4), 480–493. https://doi.org/10.1016/j.system.2006.05.002

Cárdenas-Hagan, E., Carlson, C. D., & Pollard-Durodola, S. D. (2007). The cross-linguistic transfer of early literacy skills: The role of initial L1 and L2 skills and language of

instruction. *Language, speech, and hearing services in schools*, 249-259. doi: 10.1044/0161-1461(2007/026)

Chairat, P. (2015). Attitudes and motivation of non-English major students towards learning English as a foreign language: A case study. *ASEAN Journal of Education, 1*(1), 69-83. Retrieved from http://dusithost.dusit.ac.th/~research/inter/en/flie/vol1_1/5_Pornpan.pdf

Chang, C. M. (2018). *Exploring factors influencing the willingness to communicate among english-as-a-second language university students.* Available from ProQuest Dissertations & Theses Global (Order No. 10842309). Retrieved from https://search.proquest.com/docview/2103976380?accountid=134066

Christophel, D. M. (1996). Russian communication orientations: A crosscultural examination. *Communication Research Reports*, 13, 43-51. https://doi.org/10.1080/08824099609362069

Chu, H. N. R. (2008). *Shyness and EFL learning in Taiwan: A study of shy and non-shy college students' use of strategies, foreign language anxiety, motivation, and willingness to communicate* (Doctoral dissertation). Available at UT Electronic Theses and Dissertations . Retrieved from http://hdl.handle.net/2152/3864

Clarke, V., & Braun, V. (2017). Commentary: Thematic Analysis. *Journal of Positive Psychology*, *12*(3), 297-298. doi: 10.1080/17439760.2016.1262613

Clément, R., Baker, S. C., & MacIntyre, P. D. (2003). Willingness to communicate in a second language: The effects of context, norms, and vitality. *Journal of language and social psychology*, *22*(2), 190-209. doi: 10.1177/0261927X03252758

Cohen, L., & Manion, L., & Morrison, K. (2011). *Research methods in education*. (7th ed.) London, UK: Routledge.

Consulate General of the Republic of Kazakhstan in Sydney Official site (2015) *The 100 concrete steps set out by President Nursultan Nazarbayev to implement the five institutional reforms.* Retrieved from http://mfa.gov.kz/en/sydney/content-view/100-konkretnyh-sagov-sovremennoe-gosudarstvo-dla-vseh

Courtney, M. G. R. (2008). *International posture, L2 motivation, and L2 proficiency among South Korean tertiary EFL learners* (Doctoral dissertation), The University of Waikato, Hamilton, New Zealand. Retrieved from https://hdl.handle.net/10289/2256

Coyle, D., Hood, P. & Marsh, D. (2010*). Content and Language Integrated Learning.* Cambridge, UK: Cambridge University Press.

Creswell, J. W. (2014). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Boston, MA: Pearson publications.

Creswell, J. W., & Clark, V. L. P. (2011). *Designing and conducting mixed methods research*. (2nded.). Thousand Oaks, CA: Sage publications.

Croucher, S., Rahmani, D., Säkkinen, K., & Hample, D. (2016). Communication apprehension, self-perceived communication competence, and willingness to communication in Singapore. *Journal of Intercultural Communication, 2016*. https://doi.org/10.1080/17513057.2013.769615

Darling, W. E., & Chanyoo, N. (2018). Relationships of L2 Motivational Self-System Components and Willingness to Communicate in English among Thai Undergraduate Students. *NIDA Journal of Language and Communication*, *23*(33), 1-22.Retrieved from http://www.lcjournal.nida.ac.th/file/journal_light_pink.pdf#page=7

Debois S. (2019) 10 Advantages and Disadvantages of Questionnaires. Retrieved from https://surveyanyplace.com/questionnaire-pros-and-cons/

Dörnyei, Z. (2009). The L2 motivational self system. In Z. Dörnyei, & E. Ushioda, (Eds.), *Motivation, language identity and the L2 self*, (pp. 9-42). Bristol, UK: Multilingual Matters.

Echevarria, J., Vogt, M., & Short, D. (2008). *Making content comprehensible for English learners: The SIOP model* (4th ed.). Washington, D.C.: Pearson Education publications.

Eddy-U, M. (2015). Motivation for participation or non-participation in group tasks: A dynamic systems model of task-situated willingness to communicate. *System*, *50*, 43-55. https://doi.org/10.1016/j.system.2015.03.005

Erbolovna, T. Z., Kokenovna, A. S., Adilkylovna, M. M., & Sarsenbaevna, Z. A. (2019). Development of stem-education in the world and Kazakhstan. *Научные исследования [Scientific research]*, *1*(27), 77-79. Retrieved from https://cyberleninka.ru/article/n/development-of-stem-education-in-the-world-and-kazakhstan

Fadilah, E. (2018). Perception, motivation and communicative self-confidence of indonesian students on willingness to communicate in L2 by using Facebook. *JEELS (Journal of English Education and Linguistics Studies)*, *5*(1), 23-48. Retrieved from https://pdfs.semanticscholar.org/176f/f0f8dd25d007e5151f97d4eb7f49a57dd534.pdf

Fallah, N. (2014). Willingness to communicate in English, communication self-confidence, motivation, shyness and teacher immediacy among Iranian English-major

undergraduates: A structural equation modeling approach. *Learning and Individual Differences, 30,* 140-147. https://doi.org/10.1016/j.lindif.2013.12.006

Fatmanissa, N., & Kusnandi. (2017). The Linguistic Challenges Of Mathematics Word Problems: A Research And Literature Review. *Malaysian journal of learning & instruction, Special issue on Graduate Students Research on Education*, 73-92. Retrieved from http://mjli.uum.edu.my/images/specialissue/2017/A4.pdf

Fu, L., Wang, X., & Wang, Y. (2012). The research on willingness to communicate in Chinese students' EFL study. *Journal of Language Teaching and Research*, *3*(1), 112. doi:10.4304/jltr.3.1.112-117

Fushino, K. (2010). Causal relationships between communication confidence, beliefs about group work, and willingness to communicate in foreign language group work. *TESOL quarterly*, *44*(4), 700-724. https://doi.org/10.5054/tq.2010.235993

Gao, X. S. (2010). Autonomous language learning against all odds. *System*, 38, 580-590. 10.1016/j.system.2010.09.011

Garcia, G. E. (2000). Bilingual children's reading. In. M. Kamil, P. Rosenthal, P. D. Pearson, and R. Barr (Eds.), *Handbook of reading research (* pp. 813–834). Mahwah, NJ: Erlbaum.

Gardner, H., & Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. *Educational Researcher, 18*(8), 4.Retrieved from https://about.jstor.org/terms

Gerfanova, E. (2018). Foreign language education of Kazakhstan: current trends and future perspectives. *PEOPLE: International Journal of Social Sciences*, *4*(3). *https://dx.doi.org/10.20319/pijss.2018.43.735745*

Ghanbarpour, M. (2016). Willingness to communicate, linguistic self-confidence, and language-use anxiety: The Iranian EFL context. *Theory and practice in language studies, 6*(12), 2265-2271. http://dx.doi.org/10.17507/tpls.0612.05

Ghonsooly, B., Khajavy, G. H., & Asadpour, S. F. (2012). Willingness to communicate in English among Iranian non-English major university students. *Journal of Language and Social Psychology, 31*(2), 197-211. doi: 10.1177/0261927X12438538

Goodboy, A. K., Myers, S. A., &Bolkan, S. (2010). Student motives for communicating with instructors as a function of perceived instructor misbehaviors. *Communication Research Reports, 27*(1), 11-19. https://doi.org/10.1080/08824090903526604

Granovskiy, B. (2018). *Science, Technology, Engineering, and Mathematics (STEM) Education: An Overview.* Congressional Research Service Report. Retrieved from https://fas.org/sgp/crs/misc/R45223.pdf

Haas, A., & Grapin, S., & Lee, O. (2018). How the NGSS Science Instructional Shifts and Language Instructional Shifts Support Each Other for English Learners: Talk in the Science Classroom. In Alison L. Bailey, Carolyn A. Maher, Louise C. Wilkinson (Eds.), *Language, Literacy, and Learning in the STEM Disciplines* (pp. 35-52). London, UK: Routledge

Hackman, M. Z., & Barthel-Hackman, T. A. (1993). Communication apprehension, willingness to communicate, and sense of humor: United States and New Zealand perspectives. *Communication quarterly, 41*(3), 282-291. https://doi.org/10.1080/01463379309369889

Hashimoto, Y. (2002). Motivation and willingness to communicate as predictors of reported L2 use: The Japanese ESL context. *Second language studies*, *20*(2), 29-70. Retrieved from https://core.ac.uk/download/pdf/77238697.pdf

Hennink, M., Hutter, I., & Bailey, A. (2011). *Qualitative research methods*. London, UK: Sage publications.

Hsu, W. H. (2015). Transitioning to a communication-oriented pedagogy: Taiwanese university freshmen's views on class participation. *System, 49*, 61-72. https://doi.org/10.1016/j.system.2014.12.002

Huang, J. (2009). *Autonomy, agency and identity in foreign language learning and teaching* (Doctoral dissertation) Available at HKBU Institutional Repository. Retrieved from https://repository.hkbu.edu.hk/hkbu_staff_publication/4928

İlter, O. (2018). Turkish EFL learners' willingness to communicate: promoting and debilitating sides of teacher effects. *Journal of Education and Training Studies, 6*(11a), 181-185. Retrieved from http://dergipark.org.tr/erzisosbil/issue/41970/505680

Irsaliyev S.E., Karabassova L.Ch., Mukhametzhanova A.Z., Adil A.B., Bekova M.A., Nurlanov Y.B. (2017) *Teaching in three languages: International experience and recommendations for Kazakhstan.* Astana, Kazakstan: JSC «InformationAnalytic Center»

Jiang, W. (2000). The relationship between culture and language. *ELT journal*, *54*(4), 328-334. https://doi.org/10.1093/elt/54.4.328

Jiaxin, Z. (2018). A Study on Chinese Students' WTC Inside the Classroom Under the Influences of Situational Variable. *Advances in Social Science, Education and*

Humanities Research, 289, 194-197. Retrieved from http://creativecommons.org/licenses/by-nc/4.0/

Joe, H. K., Hiver, P., & Al-Hoorie, A. H. (2017). Classroom social climate, self-determined motivation, willingness to communicate, and achievement: A study of structural relationships in instructed second language settings. *Learning and Individual Differences, 53*, 133-144. https://doi.org/10.1016/j.lindif.2016.11.005

Jourdain, L., & Sharma, S. V. (2016). Language challenges in mathematics education for English language learners: A literature review. *Waikato Journal of Education*, *21*(2). https://doi.org/10.15663/wje.v21i2.269

Jung, M. A. (2011). *Korean EFL university students' willingness to communicate in english* (Doctoral Dissertation) Available from ProQuest Dissertations & Theses Global. (Order No. 3488238). Retrieved from https://search.proquest.com/docview/914949411?accountid=134066

Kaliakbarova E., Demeuova G. (2019) . STEAM — an approach to teaching chemistry on the updated content of education. *Eurasian Union of Scientists* , *3*(60), 27-33. 10.31618/ESU.2413-9335.2019.6.60.27-33

Kamdideh, Z., & Barhesteh, H. (2019). The Effect of Extended Wait-Time on Promoting Iranian EFL Learners' WTC. *International Journal of Instruction*, *12*(3), 183-200. https://doi.org/10.29333/iji.2019.12312a

Kang, S. J. (2005). Dynamic emergence of situational willingness to communicate in a second language. *System*, *33*(2), 277-292. https://doi.org/10.1016/j.system.2004.10.004

Kanyal, M., & Cooper, L. (2012). Young children's perceptions of their classroom environment: Perspectives from England and India. In T. Papatheodorou & J. Moyles (Eds.), *Cross-cultural perspectives on earlychildhood* (pp. 58–72). London, UK: Sage.

Karabay, A. (2017). *STEM and social sciences students' language-oriented academic challenges in English medium of instruction (EMI) programs: The case of an international university in Kazakhstan.* (Doctoral dissertation). Available at Nazarbayev University Repository. Retrieved from http://nur.nu.edu.kz/handle/123456789/2557

Khajavy, G. H., Ghonsooly, B., Hosseini Fatemi, A., & Choi, C. W. (2016). Willingness to communicate in English: A microsystem model in the Iranian EFL classroom context. *Tesol Quarterly*, *50*(1), 154-180. https://doi.org/10.1002/tesq.204

Khatib, M., & Nourzadeh, S. (2015). Development and validation of an instructional willingness to communicate questionnaire. *Journal of Multilingual and Multicultural Development*, *36*(3), 266-283. https://doi.org/10.1080/01434632.2014.914523

Knell, E., & Chi, Y. (2012). The roles of motivation, affective attitudes, and willingness to communicate among Chinese students in early English immersion programs. *International Education, 41*(2), 66-87. Retrieved from: http://trace.tennessee.edu/internationaleducation/vol41/iss2/5

Kyriacou, C., & Zhu, D. (2008). Shanghai pupils' motivation towards learning English and the perceived influence of important others. *Educational Studies, 34*(2), 97-104. https://doi.org/10.1080/03055690701811099

Lamb, M. (2004). "It depends on the students themselves": Independent language learning at an Indonesian state school. *Language, Culture and Curriculum, 17*, 229–245. https://doi.org/10.1080/07908310408666695

Lamb, M. (2012). A self-system perspective on young adolescents' motivation to learn English in urban and rural settings. *Language Learning, 62*, 997–1023. doi: 10.1111/j.1467-9922.2012.00719.x

Laux, K. (2018) A theoretical understanding of the literature on student voice in the science classroom, *Research in Science & Technological Education, 36*(1), 111-129. https://doi.org/10.1080/02635143.2017.1353963

Lee, J. S., & Lee, K. (2019). Affective factors, virtual intercultural experiences, and L2 willingness to communicate in in-class, out-of-class, and digital settings. *Language Teaching Research, 0*(00), 1 –21. doi: 10.1177/1362168819831408

Léger, D. de S., & Storch, N. (2009). Learners' perceptions and attitudes: Implications for willingness to communicate in an L2 classroom. *System, 37,* 269-285. https://doi.org/10.1016/j.system.2009.01.001

Lin, Y. T. (2019). Taiwanese EFL Learners' Willingness to Communicate in English in the Classroom: Impacts of Personality, Affect, Motivation, and Communication Confidence. *The Asia-Pacific Education Researcher, 28*(2), 101-113. https://doi.org/10.1007/s40299-018-0417-y

Liu, J. (2002). Negotiating silence in American classrooms: Three Chinese cases. *Language and intercultural communication*, *2*(1), 37-54. https://doi.org/10.1080/14708470208668074

MacDonald, J. R., Clément, R., &MacIntyre, P. D. (2003). *Willingness to communicate in a L2 in a bilingual context: A qualitative investigation of Anglophone and Francophone students.* Unpublished manuscript. Cape Breton University, Nova Scotia, Canada and University of Ottawa, Ottawa, Ontario, Canada.

MacIntyre, P. D., & Charos, C. (1996). Personality, attitudes, and affect as predictors of second language communication. *Journal of Language and Social Psychology, 15*(1), 3-26. https://doi.org/10.1177/0261927X960151001

MacIntyre, P. D., Baker, S. C., Clément, R., & Conrod, S. (2001). Willingness to communicate, social support, and language-learning orientations of immersion students. *Studies in second language acquisition*, *23*(3), 369-388. doi: https://doi.org/10.1017/S0272263101003035

MacIntyre, P. D., Burns, C., & Jessome, A. (2011) Ambivalence about communicating in a second language: A qualitative study of French immersion students' WTC. *The Modern Language Journal, 95*(1), 81-96. doi: 10.1111/j.1540-4781.2010.01141.x

MacIntyre, P. D., Clément, R., Dörnyei, Z., & Noels, K. A. (1998). Conceptualizing willingness to communicate in a L2: A situational model of L2 confidence and affiliation. *The Modern Language Journal, 82*(4), 545-562. https://doi.org/10.1111/j.1540-4781.1998.tb05543.x

MacIntyre, p.D. (1994). Variables Underlying Willingness to Communicate: A Causal Analysis. *Communication Research Reports*, 11, 135–142. https://doi.org/10.1080/08824099409359951

Marchand, T. (2012). Reticence in the classroom: examples, causes, and suggestions for improvement. *In search of a learner-centered education, 12,* 159-179.

Marsh, D. (2002). *CLIL/EMILE-The European dimension: Actions, trends and foresight potential*. Jyväskylä, Finland: Public Services Contract DG EAC: European Commission.

Matsuoka, R. (2006). *Japanese college students' willingness to communicate in english* (Doctoral dissertation) Available from ProQuest Dissertations & Theses Global. (Order No. 3233454). Retrieved from https://search.proquest.com/docview/304982405?accountid=134066

McCarthey, S. & Zheng, Z., (2010). Principles for writing practices with young ELLs. In G. Li & P. A. Edwards (Eds.), *Best practices in ELL instruction (*pp.103-128). New York, NY: Guilford Press.

McCroskey, J. C , & McCroskey, L. L. (1986, February). *Correlates of willingness to communicate* [Conference presentation] Western Speech Communication Association convention, Tucson, AZ. (a).

McCroskey, J. C , & McCroskey, L. L. (1986, May). *Predictors of willingness to communicate: Implications for screening and remediation* [Conference presentation] International Communication Association convention, Chicago, IL.(b)

McCroskey, J. C, & McCroskey, L. L. (1986, November). *Communication competence and willingness to communicate* [Conference presentation] Speech Communication Association convention, Chicago, IL. (c)

McCroskey, J. C. (1977). Oral communication apprehension: A summary of recent theory and research. *Human communication research, 4*(1), 78-96. https://doi.org/10.1111/j.1468-2958.1977.tb00599.x

McCroskey, J. C. (1992). Reliability and Validity of the Willingness to Communicate Scale. *Communication Quarterly*, *40*(1), 16–25. https://doi.org/10.1080/01463379209369817

McCroskey, J. C. (1997). Willingness to Communicate, Communication Apprehension, and Self-Perceived Communication Competence: Conceptualizations and Perspectives. In A. Daly, J. C. McCroskey, J. Ayres, T. Hopf, & D. M. Ayres, *Avoiding Communication: Shynes, Reticence, Communication Apprehension*s (pp. 75-108). Cresskill: NJ: Hampton Press.

McCroskey, J. C., & Baer, J. E. (November, 1985). *Willingness to communicate and its measurement* [Conference presentation]. Speech Communication Association Convention, Denver, CO.

McCroskey, J. C., & Richmond, V. (1982). Communication apprehension and shyness: Conceptual and operational distinctions. *Central States Speech Journal*, 33, 458-468. https://doi.org/10.1080/10510978209388452

McCroskey, J. C., & Richmond, V. P. (1990). Willingness to communicate: A cognitive view. *Journal of Social Behavior & Personality*, *5*(2), 19–37. Retrieved from the APA PsycInfo database

McCroskey, J. C., Burroughs, N. F., Daun, A., & Richmond, V. P. (1990). Correlates of quietness: Swedish and American perspectives. *Communication Quarterly*, 38, 127-137. https://doi.org/10.1080/01463379009369749

Mercer, S. (2012). The complexity of learner agency. *Apples-Journal of Applied Language Studies*, 6(2), 41–59. Retrieved from http://apples.jyu.fi/

Mertens, D. M. (2015). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. Thousands Oaks, CA: Sage publications.

Mitchell, R., & Myles, F. (2004). *Second Language Learning Theories.* Oxford, UK: Oxford University Press.

MoES (Ministry of Education and Science). (2011). *The State Program for Education Development 2011-2020.* Retrieved from https://strategy2050.kz

MoES (Ministry of Education and Science). (2014). *Road Map for updating educational content for 2013-2028.* (Approved by the Minister of Education and Science of the Republic of Kazakhstan on August 18, 2014). Astana, Kazakhstan: MoES.

MoES (Ministry of Education and Science). (2016). *The State Program of Education and Science Development 2016-2019*. Retrieved from https://strategy2050.kz

Mohammadian, T. (2013). The Effect of Shyness on Iranian EFL Learners. Language Learning Motivation and Willingness to Communicate. *Theory and Practice in Language Studies*, *3*(11), 2036. doi:10.4304/tpls.3.11.2036-2045

Mortensen, C., Arntson, P., & Lustig, M. (1977). The measurement of verbal predispositions: scale development and application. *Human Communication Research,* 3, 146-158. https://doi.org/10.1111/j.1468-2958.1977.tb00513.x

Moschkovich, J. (2018). Talking to learn mathematics with understanding: Supporting academic literacy in mathematics for English learners. In Alison L. Bailey, Carolyn A. Maher, Louise C. Wilkinson (Eds.), *Language, Literacy, and Learning in the STEM Disciplines* (pp.13-34).London,UK: Routledge.

Munezane, Y. (2014). *A structural equation model and intervention study of individual differences, willingness to communicate, and L2 use in an EFL classroom* (Unpublished doctoral dissertation). Temple University, Philadelphia, PA

Myers, S. A., & Claus, C. J. (2012). The relationship between students' motives to communicate with their instructors and classroom environment. *Communication Quarterly, 60*(3), 386-402. https://doi.org/10.1080/01463373.2012.688672

Mystkowska-Wiertelak, A., & Pawlak, M. (2017). *Willingness to communicate in instructed second language acquisition: Combining a macro-and micro-perspective*. Bristol,UK: Multilingual Matters.

Nazarbayev University Graduate School of Education (NUGSE) (2014). *Development of Strategic Directions for Education Reforms in Kazakhstan for 2015-2020* [Diagnostic report]. Astana, Kazakhstan: Indigo print.

Nazarbayev, N. (2012). *Strategy-2050.* Retrieved from http://www.akorda.kz/ru/official_documents/strategies_and_programs

Olsen, M. (2017). *Motivation, learner attrition, and the L2 motivational self system: A New Zealand study of heritage and non-heritage university language learners* (Doctoral dissertation).University of Otago. Retrieved from http://hdl.handle.net/10523/7557

Öz, H. (2014). Big five personality traits and willingness to communicate among foreign language learners in Turkey. *Social Behavior and Personality: An International Journal, 42*(9), 1473-1482. https://doi.org/10.2224/sbp.2014.42.9.1473

Öz, H. (2016). Role of the ideal L2 self in predicting willingness to communicate of EFL students. In İ.H. Mirici, I.H. Erten, H. Öz, and I.Vodopija-Krstanović (Eds.), *Research papers as an Additional Language*, 163-182.

Öz, H., Demirezen, M., & Pourfeiz, J. (2015). Willingness to communicate of EFL learners in Turkish context. *Learning and Individual Differences,* 37, 269-275. https://doi.org/10.1016/j.lindif.2014.12.009

Palfreyman, D. (2006). Social context and resources for language learning. *System*, *34*(3), 352-370. https://doi.org/10.1016/j.system.2006.05.001

Pawlak, M., & Mystkowska-Wiertelak, A. (2015). Investigating the Dynamic Nature of L2 Willingness to Communicate. *System, 50,* 1–9. https://doi.org/10.1016/j.system.2015.02.001

Peng, J. (2007). Willingness to communicate in an L2 and integrative motivation among college students in an intensive English language program in China. *University of Sydney Papers in TESOL, 2,* 33–59. Retrieved from http://faculty.edfac.usyd.edu.au/projects/usp_in_tesol/pdf/volume02/article02.pdf

Peng, J. E. (2012). Towards an ecological understanding of willingness to communicate in EFL classrooms in China. *System, 40,* 203- 213. https://doi.org/10.1016/j.system.2012.02.002

Peng, J. E. (2014). *Willingness to communicate in the Chinese EFL university classroom: An ecological perspective,* (Vol. 76). Bristol, UK: Multilingual Matters.

Peng, J. E. (2015). L2 motivational self system, attitudes, and affect as predictors of L2 WTC: An imagined community perspective. *The Asia-Pacific Education Researcher*, *24*(2), 433-443. https://doi.org/10.1007/s40299-014-0195-0

Peng, J. E. (2019). The roles of multimodal pedagogic effects and classroom environment in willingness to communicate in English. *System*, *82*, 161-173. https://doi.org/10.1016/j.system.2019.04.006

Peng, J., & Woodrow L. (2010). Willingness to Communicate in English: A Model in the Chinese EFL Classroom Context. *Language Learning*, *60*(4), 834–876. doi: 10.1111/j.1467-9922.2010.00576.x

Platsidou, M., Kantaridou, Z., &Papadopoulou, I. (2017). International orientation as predictor of EFL learning strategy use in adolescent students. *Language, Culture and Curriculum*, *30*(2), 157-173. https://doi.org/10.1080/07908318.2016.1236127

Prasetyanto, B. T., Wibawani, D. A., Wardani, E. N., & Drajati, N. A. (2019). Teacher's Reinforcements Affecting Students' Willingness to Communicate (WTC): A Photovoice in EFL Classroom. *Indonesian Journal of EFL and Linguistics*, *4*(1), 57-71.Retrieved from www.indonesian-efl-journal.org

Prihartanti, N. (2017). Willingness to communicate in English: A case study of Indonesian university students. *Kajian Linguistik Dan Sastra*, *25*(1), 71-81. https://doi.org/10.23917/kls.v25i1.86

Pyun, D. O., Kim, J. S., Cho, H. Y., & Lee, J. H. (2014). Impact of affective variables on Korean as a foreign language learners' oral achievement. *System, 47*, 53-63. https://doi.org/10.1016/j.system.2014.09.017

Quyen, B. T. T., & Tham, D. M. (2018). Creating an active environment for students' willingness to communicate in English. Proceedings of the International conference on language teaching and learning today 2018*: Diversity and Unity of Language Education in the Globalised Landscape*, Ho Chi Minh City, Vietnam: VNU-HCM Publishing House

Rastegar, M., & Karami, M. (2015). On the relationship between foreign language classroom anxiety, willingness to communicate and scholastic success among Iranian EFL

learners. *Theory and Practice in Language Studies, 5*(11), 2387-2394. http://dx.doi.org/10.17507/tpls.0511.25

Razak, F. N. A., Nimehchisalem, V., & Abdullah, A. N. (2018). The Relationship between Ethnic Group Affiliation (EGA) and Willingness to Communicate (WTC) in English among Undergraduates in a Public University in Malaysia. *International Journal of Applied Linguistics and English Literature, 7*(6), 207-213. doi: 10.7575/aiac.ijalel.v.7n.6p.207

Rebecca, O. (1990). *Language learning strategies: What every teacher should know.* Boston. MA: Heinle and Heinle.

Reinders, H. & Wattana, S. (2015). Affect and willingness to communicate in digital game-based learning. *ReCALL*, *27*, 38-57. doi:10.1017/S0958344014000226

Riasati, M. J. (2012). EFL learners' perception of factors influencing willingness to speak English in language classrooms: A qualitative study. *World Applied Sciences Journal*, *17*(10), 1287-1297. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.390.1430&rep=rep1&type=pdf

Riasati, M. J. (2018). Willingness to speak English among foreign language learners: A causal model. *Cogent Education*, *5*(1), 1455332. https://doi.org/10.1080/2331186X.2018.1455332

Riasati, M. J., & Noordin, N. (2011). Antecedents of willingness to communicate: A review of literature. *Studies in Literature and Language*, *3*(2), 74. doi: 10.3968/j.sll.1923156320110302.326

Riasati, M. J., & Rahimi, F. (2018). Situational and individual factors engendering willingness to speak English in foreign language classrooms. *Cogent Education, 5*(1), 1-15. https://doi.org/10.1080/2331186X.2018.1513313

Ritchie, J., Lewis, J., Nicholls, C. M., & Ormston, R. (Eds.). (2013). *Qualitative research practice: A guide for social science students and researchers.* Thousand Oaks, CA: Sage publications.

Rockafellow, J (2016). Higher Ed SIG: Student Perceptions of Weaknesses in Mainstream STEM Classes. *ITBE Link.* Retrieved from https://www.itbe.org/v_newsletters/article_56131027.htm

Rowland, L. (2011). Lessons about learning: Comparing learner experiences with language research. *Language Teaching Research, 15*(2), 254-267. doi: 10.1177/1362168810388726

Rubin, H. J., & Rubin, I. S. (2011). *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA: Sage publications.

Saeedakhtar, A., Hamidizare, S., & Abdi, R. (2018). The Interplay of Motivation and Willingness to Communicate in Four Skills: The Iranian Perspective. *Iranian Journal of English for Academic Purposes*, *7*(1), 72-95. 10/IJEAP- 1810-1291

Sahin, A & Top, N (2015). STEM Students on the Stage (SOS): Promoting Student Voice and Choice in STEM Education through an Interdisciplinary, Standards-focused Project Based Learning Approach. *Journal of STEM Education, 16*(3), 24-33. Retrieved from http://ojs.jstem.org/

Sallinen-Kuparinen, A., McCroskey, J. C., & Richmond, V. P. (1991). Willingness to communicate, communication apprehension, introversion, and self-reported

communication competence: Finnish and American comparisons. *Communication Research Reports, 8*(1), 55-64. https://doi.org/10.1080/08824099109359876

San Isidro, X. & Lasagabaster, D. (2020). Lessons to be learned: a professional development approach to curriculum planning in a multilingual school in Galicia. In K. Bower G. Chambers, D. Coyle & R. Cross (Eds.), *Cross-curricular language learning: Putting CLIL into practice*. Cambridge, UK: Cambridge University Press.

San Isidro, X. (2018). Innovations and challenges in CLIL implementation in Europe. *Theory Into Practice, 57*(3), 185-195. https://doi.org/10.1080/00405841.2018.1484038

Secada, W. G., Medina, E., & Avalos, M. A. (2018). Reading Mathematics Problems: Exploring How Language Counts for Middle School Students With Varying Mathematics Proficiency. In Alison L. Bailey, Carolyn A. Maher, Louise C. Wilkinson (Eds.), *Language, Literacy, and Learning in the STEM Disciplines* (pp. 73-96). London, UK: Routledge

Şener, S. (2014). Turkish ELT students' willingness to communicate in English. *ELT Research Journal,* 3(2), 91-109.Retrieved from http://www.udead.org.tr/journal

Shao, Q., & Gao, X. A. (2016). Reticence and willingness to communicate (WTC) of East Asian language learners. *System, 63*, 115-120. https://doi.org/10.1016/j.system.2016.10.001

Shen, X., & Byfield, L. (2018). Promoting English Learners' Willingness to Communicate in Content-area Classrooms. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 91*(6), 250-257. https://doi.org/10.1080/00098655.2018.1541856

Subekti, A. S. (2019). Situational Willingness to Communicate in English: Voices from Indonesian Non-English Major University Students. *IJELTAL (Indonesian Journal of*

English Language Teaching and Applied Linguistics), *3*(2), 373-390. http://dx.doi.org/10.21093/ijeltal.v3i2.240

Syed, H., & Kuzborska, I. (2018). Dynamics of factors underlying willingness to communicate in a second language. *The Language Learning Journal*, 1-20. https://doi.org/10.1080/09571736.2018.1435709

Teimouri, Y. (2017). L2 Selves, emotions, and motivated behaviours. *Studies in Second Language Acquisition*, *39*(4), 681–709. doi:10.1017/S0272263116000243

Ushioda, E. (2009). A person-in-context relational view of emergent motivation, self and identity. In Z. Dörnyei & E. Ushoda (Eds.), *Motivation, language identity and the L2 self* (pp. 215–228). Bristol, UK: Multilingual Matters.

van Lier, L. (2008). Agency in the classroom. In J. P. Lantolf & M. E. Poehner (Eds.), *Sociocultural theory and the teaching of second languages* (pp. 163-186). London,UK: Equinox Publishing Ltd

Van Rossum, E. J., & Hamer, R. N. (2010). *The meaning of learning and knowing*. Rotterdam, The Netherlands: Sense publishers.

Weaver, C. (2010). *Japanese university students' willingness to use English with different interlocutors* (Unpublished doctoral dissertation), Temple University, Japan

Wen W. & Clement R. (2003), A Chinese Conceptualization of Willingness to Communicate in ESL, *Language, Culture and Curriculum, 16*(1), 18-38. https://doi.org/10.1080/07908310308666654

Williams, M., Mercer, S., & Ryan, S. (2016). *Exploring psychology in language learning and teaching*. Oxford,UK: Oxford University Press.

Wu, C. P., & Lin, H. J. (2014). Anxiety about speaking a foreign language as a mediator of the relation between motivation and willingness to communicate. *Perceptual and motor skills,* 119(3), 785-798. https://doi.org/10.2466/22.PMS.119c32z7

Yashima, T. (2002). Willingness to communicate in a second language: The Japanese EFL context. *The Modern Language Journal, 86*(1), 54–66. https://doi.org/10.1111/1540-4781.00136

Yashima, T.(2019). L2 Motivation and Willingness to Communicate. In M. Lamb, K. Csizér, A. Henry, S.Ryan (Eds.) *The Palgrave Handbook of Motivation for Language Learning* (pp. 203-223). London, UK: Palgrave Macmillan.

Yashima, T., MacIntyre, P. D., & Ikeda, M. (2018). Situated willingness to communicate in an L2: Interplay of individual characteristics and context. *Language Teaching Research*, *22*(1), 115-137. https://doi.org/10.1177/1362168816657851

Yashima, T., Zenuk-Nishide, L. & Shimizu, K. (2004). The influence of attitudes and affect on willingness to communicate and second language communication. *Language Learning*, *54*(1), 119-152. https://doi.org/10.1111/j.1467-9922.2004.00250.x

Yu, M. (2011). Effect of communication variables, affective variables, and teacher immediacy on WTC of foreign language learners. *Chinese Journal of Communication*, *4*(02), 218-236. https://doi.org/10.1080/17544750.2011.565678

Zarrinabadi, N. (2014). Communicating in a Second Language: Investigating the Effect of Teacher on Learners' Willingness to Communicate. *System*, *42*, 288–295. https://doi.org/10.1016/j.system.2013.12.014

Zarrinabadi, N., & Tanbakooei, N. (2016). Willingness to communicate: Rise, development, and some future directions. *Language and Linguistics Compass, 10*(1), 30-45. https://doi.org/10.1111/lnc3.12176

Zeng, M. (2010). *Chinese students' willingness to communicate in English in Canada* (Unpublished doctoral dissertation), University of Windsor, Ontario, Canada

Zhang, J. (2018). *The Power of the Situation: Variability and Stability in Chinese University Students' Willingness to Communicate in English Classrooms* (Doctoral dissertation, Durham University). Available at Durham E-Theses Online: http://etheses.dur.ac.uk/12781/

Zhong, Q. M. (2013). Understanding Chinese learners' willingness to communicate in a New Zealand ESL classroom: A multiple case study drawing on the theory of planned behavior. *System, 41*(3), 740-751. https://doi.org/10.1016/j.system.2013.08.001

Zhumzhumina, A. (2013, December 1*). Nazarbayev calls Kazakhstan to learn English.* Retrieved from https://en.tengrinews.kz/edu/Nazarbayev-calls-Kazakhstan-tolearn

Appendices

Appendix A

Data Collection Instruments

Closed-ended questionnaires in English, Kazakh, and Russian

Willingness to Communicate in English in STEM Classes

1 = Not at all likely
2 = A little likely
3 = Somewhat likely
4 = Very Likely
5 = Extremely likely

Statements	Scale				
	1	2	3	4	5
1. I speak in English in STEM classes even if other students laugh at my language mistakes					
2. I speak in English in STEM classes even if I know my classmates are better than me at speaking English					
3. I give a presentation in English in STEM classes in front of my classmates					
4. I speak in English in STEM classes even if my language mistakes are frequently corrected by the teacher					
5. I talk in English in STEM classes in group-work activities					
6. I speak in English in STEM classes when I know the correct answer.					
7. I speak in English in STEM classes when I can really clarify the issue under discussion.					
8. I speak in English in STEM classes when my views differ from my classmates' views.					
9. I speak in English in STEM classes when my views differ from					

the teacher's views.					
10. I speak in English in STEM classes when no one else is talking.					
11. I speak more in English in STEM classes when a discussion is related to my own personal experiences					
12. I began to speak more in English in STEM classes after I became familiar with my teacher					
13. I find opportunities to speak in English in STEM classes no matter how crowded the classroom is					
14. I speak more in English in STEM classes when I am sitting in the front of the class.					
15. I speak more in English in STEM classes when I know exactly what has to be done					
16. I speak more in English in STEM classes when the teacher provides a timely response to my concerns.					
17. I speak in English in STEM classes when the class is engaged in an open discussion or debate.					
18. I talk to my classmates in English about my ideas for experiment in STEM classes					
19. I talk to my classmates in English STEM classes about recently learned material					
20. I talk in English to brainstorm ideas to solve tasks in a whole-class discussion STEM classes.					
21. I talk in English about topics I know (such as human body systems or forms of energy) in a group discussion STEM classes					
22. I speak more in English in STEM classes when the topic is interesting.					

23. I ask my classmate about the correct pronunciation of a new English word					
24. I ask another student to explain the grammatical rule in English					
25. I ask my teacher in English to repeat what he or she has just said if I did not understand it					
26. I raise your hand to ask or answer questions in English					
27. I speak in English when I am ready for STEM classes.					
28. I speak in English when my participation is being graded.					

If you also want to participate in the interviewing part of this study, you could tick here ▢

and write your name _____

Thank you for your answers!

Оқушылардың STEM пәндері сабағында ағылшын тілінде сөйлесуге дайындығы

1 = Мүлдем мүмкін емес
2 = Мүмкіндігі аз
3 = Біршама мүмкін
4 = Мүмкіндігі бар
5 = Мүмкіндігі зор

Мәлімдемелер	Шкала				
	1	2	3	4	5
1. Басқа оқушылардың менің тілдік қателеріме күлгеніне қарамастан, мен STEM сабақтарында ағылшын тілінде сөйлеймін					
2. Сыныптастарымның ағылшын тілінде менен жақсы сөйлейтінін білсем де, мен STEM сабақтарында ағылшын тілінде сөйлеймін					
3. Мен STEM сабақтарында сыныптастарымның алдында ағылшын тілінде презентация жасаймын/көрсетемін					
4. Менің тілдік қателерім мұғалім тарапынан жиі түзетілсе де, мен STEM сабақтарында ағылшын тілінде сөйлеймін					
5. Мен STEM сабақтарының топтық жұмысында ағылшын тілінде сөйлеймін					
6. Мен STEM сабақтарында дұрыс жауабын білсем ағылшын тілінде сөйлеймін.					
7. Мен STEM сабақтарында талқыланған сұрақты шын мәнінде түсіндіре алатын кезде ағылшын тілін сөйлесемін.					
8. Менің көзқарастарым сыныптастарымның көзқарастарынан өзгеше болса да, мен STEM сабақтарында ағылшын тілін сөйлесемін.					
9. Менің көзқарастарым мұғалімнің көзқарасынан өзгеше болса да, мен STEM сабақтарында ағылшын тілінде сөйлеймін.					
10. Мен STEM сабақтарында ешкім сөйлемеген кезде де ағылшын тілінде сөйлеймін.					

11. STEM сабақтарында пікірталас менің жеке тәжірибеммен байланысты болса мен ағылшын тілінде көбірек сөйлесемін.					
12. Мен STEM сабақтарында мұғаліммен жақынырақ танысқаннан соң ағылшын тілінде көбірек сөйлей бастадым					
13. Мен STEM сабақтарында сыныптағы оқушыны санының көп болуына қарамастан ағылшын тілінде сөйлеуге мүмкіндік таба аламын					
14. Мен STEM сабақтарында сыныптың алдынғы жағында отырғанда ағылшын тілінде көбірек сөйлесемін.					
15. Мен STEM сабақтарында не істеу керектігін нақты білсем ағылшын тілінде көбірек сөйлеймін					
16. Мұғалім STEM сабақтарында менің сұрақтарыма дер кезінде жауап берсе, мен ағылшын тілінде көбірек сөйлеймін.					
17. Мен STEM сабақтарында сыныпта ашық пікірталас болған кезде ағылшын тілінде сөйлеймін.					
18. Мен STEM сабақтарында сыныптастарыма ағылшын тілінде тәжірибе туралы ойларымды айта аламын					
19. Мен STEM сабақтарында өзімнің сыныптастарыммен жақында үйренген материал туралы ағылшынша сөйлесемін.					
20. STEM сабақтарында бүкіл сыныптық талқылаудағы тапсырмаларды шешуде мен ағылшын тілінде ой-талқы жасай алаламын.					
21. STEM сабақтарында топтық талқылауда мен өзім білетін тақырыптар (мысалы, адам денесі жүйесі немесе энергия түрлері) бойынша ағылшынша сөйлесе аламын.					
22. STEM сабақтарында тақырып қызықты болған кезде мен ағылшын тілінде көбірек сөйлеймін					
23. Мен өзімнің сыныптасымнан жаңа ағылшын сөзінің дұрыс айтылуын сұраймын					

24. Мен басқа оқушыдан ағылшын тіліндегі грамматикалық ережені түсіндіруді сұраймын					
25. Мұғалім айтқанын түсінбесем, мен ағылшын тілінде мұғалімнен оны қайталауын сұраймын					
26. Мен ағылшын тілінде сұрақтар қоюға немесе жауап беру үшін қолымды көтеремін					
27. Мен STEM сабақтарына дайын болған кезде ағылшын тілінде сөйлеймін.					
28. Менің қатысуым бағаланса, мен ағылшынша сөйлеймін					

Егер сіз де осы зерттеудің сұхбаттасу бөліміне қатысқыңыз келсе,

мына жерге белгі қойыңыз

▢

және өз атыңызды осында жазыңыз

_____

Жауаптарыңыз үшін рахмет!

Готовность учащихся общаться на английском языке на уроках STEM предметов

1 = Вряд ли
2 = Маловероятно
3 = Отчасти вероятно
4 = Весьма вероятно
5 = Высокая вероятность

Утверждение	Шкала				
	1	2	3	4	5
1. Я говорю на английском языке на уроках STEM предметов, даже если другие студенты смеются над моими языковыми ошибками					
2. Я говорю на английском языке на уроках STEM предметов, даже если я знаю, что мои одноклассники лучше меня говорят по-английски					
3. Я даю презентацию на английском языке на уроках STEM перед моими одноклассниками					
4. Я говорю на английском языке на уроках STEM предметов, даже если мои языковые ошибки часто исправляются учителем					
5. Я говорю на английском языке в групповых работах на уроках STEM предметов.					
6. Я говорю на английском языке на уроках STEM предметов, когда знаю правильный ответ.					
7. Я говорю на английском языке на уроках STEM предметов, когда я действительно могу прояснить обсуждаемый вопрос.					
8. Я говорю на английском языке на уроках STEM предметов, даже когда мои взгляды отличаются от взглядов моих одноклассников.					
9. Я говорю на английском языке на уроках STEM предметов, даже когда мои взгляды отличаются от взглядов моих преподавателя.					
10. Я говорю на английском языке на уроках STEM предметов, когда никто не говорит.					

11. Я больше говорю на английском языке на уроках STEM предметов, когда обсуждаемая тема связана с моим личным опытом					
12. Я начинаю больше говорить на английском языке на уроках STEM предметов после того, как буду достаточно знаком с моим преподавателем					
13. Я нахожу возможность говорить на английском языке на уроках STEM предметов, независимо от того, насколько многолюдно в классе					
14. Я больше говорю на английском языке на уроках STEM предметов, когда я сижу в передних рядах					
15. Я больше говорю на английском языке на уроках STEM предметов, когда точно знаю, что нужно делать					
16. Я больше говорю на английском языке на уроках STEM предметов, когда учитель своевременно отвечает на ваши вопросы.					
17. Я говорю на английском языке на уроках STEM предметов, когда в классе идет открытая дискуссию или дебаты.					
18. Я могу обсудить мои идеи для эксперимента с моими одноклассниками на английском языке на уроках STEM предметов					
19. Я говорю со своими одноклассниками на уроках STEM предметов на английском о недавно изученном материале					
20. Я придумываю и предлагаю идеи для решения задач во всеобщей дискуссии на английском языке на уроках STEM предметов.					
21. Я говорю на темы, которые я больше всего знаю (к примеру, такие как системы человеческого тела или формы энергии) на английском языке в групповой дискуссии на уроках STEM предметов.					
22. Я больше говорю на английском языке на уроках STEM предметов, когда тема интересная.					
23. Я могу спросить одноклассника(цу) о правильном произношении нового английского слова					

24. Я могу попросить одноклассника(цу) объяснить грамматическое правило на английском языке.					
25. Я могу просить преподавателя повторить на английском языке то, что он/она сказал (а), если я что-то не понял					
26. Я поднимаю руку, чтобы задать или ответить на вопросы на английском языке					
27. Я говорю на английском языке на уроках STEM предметов, когда я подготовлен (а) к уроку					
28. Я говорю на английском языке на уроках STEM предметов, когда мое участие на уроке оценивается					

Если вы также хотите принять участие в интервью в следующей части исследования,

то поставьте пожалуйста галочку здесь ▢

и напишите ваше имя _____

Спасибо за ваши ответы!

Appendix B

Interview protocol for individual semi-structured interviews

Time of Interview:
Date:
Place:
Grade:
Interviewee:
Interviewer: Akmaral Keniskhanova

Interviewer:
Good morning, dear _____!
My name is Akmaral Keniskhanova. I am a second year master student at Nazarbayev University Graduate School of Education. I am very thankful to you for showing your agreement to participate in this interview.
This interview is part of the research study devoted to learn about your willingness to communicate in English in STEM subjects as well as the factors affecting your interaction in English in the classroom.
Regarding this interview, I would like to inform that:
- Your participation in the interview is on a voluntary basis;
- Your name and the information you provide will remain confidential;
- You can select any of three languages (Kazakh, Russian, English) to be interviewed on;
- The interview will last for 30 minutes;
- This interview will be audio recorded only with your permission and copies of the audiotape will be kept in a locked cabinet and disposed after two years period of storage;
-The information obtained will be used in writing a thesis;
- You will have a right to stop and withdraw from the interview any time.
If you are agree to participate in this study, please read and sign an informed consent form.
Thank you very much again for your participation!
Can we start the interview?

Interview Questions
1) What is your mother tongue?
2) Where did you receive your previous education? In which language was it?
3) Do you think that it is important to study STEM subjects in English? If yes/no, why?
4) When do you really feel that you are more WTC in English in the class?
5) How confident do you feel yourself speaking in English? What factors can influence that?
6) To what extent can familiarity with topic of communication increase or reduce your WTC in English?
7) Do you feel more or less willing to ask your teacher or your peers if you do not understand anything in the classroom?
8) To what extent can the teacher's role in the class help or decrease your WTC in English?
9) Do you feel that being less willing to communicate in English influence your educational achievements? If yes/no, why?

10) What are the most difficult things that stop you from being willing to communicate in English?
11) Do you feel more or less willing to talk with your peers in English outside the classroom or before the beginning of the lesson?
12) Do you think that your willingness to communicate in English changes from situation to situation or even from person to person?

Interview protocol

Descriptive Coding	Transcribing	Direct coding
	- What is your mother tongue? - Kazakh - Where did you receive your previous education? In which language was it?	
No previous experience	- I came from Shymkent. Education was only Kazakh there. Here I moved only in the 8th grade. I could speak Russian also. - Do you think that it is important to study STEM subjects in English? If yes/no, why?	
Importance of STEM: Could be good for future	- It's important for our future. Actually, I want to go to study at ENU which is here in Nur-Sultan. I want to study Kazakh language and literature. But If I have a STEM program, I could probably go for English also. That's why I need to learn English. - When do you really feel that you are more WTC in English in the class?	
Factor: Influence of a teacher	- We always talk in English in classes of English. In STEM classes we could talk in Kazakh but if the lesson goes in English, then we try to talk in English. You know, we didn't have a teacher of biology in the first quarter, so another teacher-teacher of English - taught biology classes.	
Factor: confident in English on knowledge of English	- How confident do you feel yourself speaking in English? - For 50% because I do not speak English very well because I say right in English, I do not read it correctly. - What factors can influence that?	
Factor: Influence of parents and friends	- Sometimes I communicate with friends in English, Russian and Kazakh. It is a kind of a bit of English, a bit of Kazakh and a bit of Russian. That is why we can talk every day. Sometimes we can talk about something what was in the lesson. I also practice them at home. My mum teaches English. My mother speaks English at home. - To what extent can familiarity with topic of communication increase or reduce your WTC in English?	
Factor: motivation	- If I do not know, it will effect mostly. Therefore,	

not to fail on exam	when teacher explains past simple in English, for example. It is important to understand and know it, otherwise we will fail to complete tasks. In STEM classes if do not know the topic firstly I ask peers, and then only ask a teacher. If the lesson is in English, I will probably ask in English. If I know the topic I will try to help teacher, for example, to help to explain my classmates the topic	"I have a lot of intentions, because if I do not understand it, it will be bad for me"
	- Do you feel more or less willing to ask your teacher or your peers if you do not understand anything in the classroom?	"At first it was difficult but then we get used to use English while talking with teacher but while talking with peers we can use Kazakh if it is difficult to understand (biology class)"
Factor: Understanding the Topic	- Actually, I have a lot of intentions, because if I do not understand it, it will be bad for me. So it is better to ask from teacher or peers as soon as possible.	
	- To what extent can the teacher's role in the class help or decrease your WTC in English?	
Factor: Speaking in Eng with teacher affects on interaction btw T-S, but not often on S-S interaction	- It can be better felt in biology classes because we can talk sometimes at these classes. At first it was difficult but then we get used to use English while talking with teacher but while talking with peers we can use Kazakh if it is difficult to understand (biology class). I find it difficult to talk in computer science (ICT) classes because we work mostly on computers. We sometimes speak in Kazakh or Russian with our friends in ICT classes, but we need to talk in English with teacher.	"We sometimes speak in Kazakh or Russian with our friends in ICT classes, but we need to talk in English with teacher"
	- Do you feel that being less willing to communicate in English influence your educational achievements? If yes/no, why?	
WTC→E.A →understanding of topic and international posture	- It can affect 100% if these classes are taught in English and you do not understand it, it will affect your achievements. Probably it could affect to the future if somebody wants to study abroad , so it is better to start now.	"I think mobile phones can affect us because we are sitting day and night on the phone. You know, when we are free, we pick up the phone and spend a lot of time on it. Instead of doing that we could read the books and practice English but we do not do that because of phones. Mobile phone also detracts from the lesson also because we look at the phone so often to know when the lesson finishes and other things
	- What are the most difficult things that stop you from being willing to communicate in English?	
Factor: Negative effect of mobile phones (destruction in and oustside the class)	- I think mobile phones can affect us because we are sitting day and night on the phone. You know, when we are free, we pick up the phone and spend a lot of time on it. Instead of doing that we could read the books and practice English but we do not do that because of phones. Mobile phone also detracts from the lesson also because we look at the phone so often to know when the lesson finishes and other things	
	- Do you feel more or less willing to talk with your peers in English outside the classroom or before the beginning of the lesson?	
Language	- I can't say so. But sometimes my close friend and I	

practice with parents and friends Factor: Interlocutor's level of proficiency	try to practice Russian during the time we spend to get from one classroom to another classroom or English in the same way. At home the situation different, my mother knows English and tells me to speak in English, my father speaks in Kazakh, as he works a lot I do not see him often. - Do you think that your WTC in English changes from situation to situation or even from person to person? - I think it is mostly depend on person, if our level of English is the same we could speak. And if he/she doesn't know English, we speak in Kazakh.	phone also detracts from the lesson also because we look at the phone so often to know when the lesson finishes and other things" "I think it is mostly depend on person, if our level of English is the same we could speak. And if he/she doesn't know English, we speak in Kazakh"

Thank you very much for your participation in this study!
I really appreciate your collaboration because your voice is very important in the improvement of STEM teaching and learning in English in Kazakhstan!
Good luck!

Appendix C

Informed Consent Forms in three languages.

INFORMED CONSENT FORM FOR THE HEAD TEACHER

Understanding Kazakhstani Students' Willingness to Communicate in English in Senior Secondary STEM Subjects

DESCRIPTION:
This study has been approved by the Research Committee of the Graduate School of Education at Nazarbayev University. You are invited to participate in a research study on the main factors that affect Kazakhstani students' willingness to communicate in English in senior secondary STEM (i.e. Science Technology Engineering and Mathematics) subjects. Your students in Grades 9 will be asked to complete a questionnaire inside the classroom, and participate in a one-on-one interview with their permission to record it. Their anonymity and confidentiality will be protected, since the pseudonyms will be used. Moreover, the recorded interviews will be stored in a safe place and be deleted after a couple of years. During the analysis process only the advisor and the researcher can have access to the data. As the process of interviewing starts students will have an opportunity not to answer any of the questions that they will find inappropriate.

RISKS AND BENEFITS:
The risks associated with this study are minimal. The study is not conducted to make judgements about the students or the school, but to draw a general understanding of a group of students' experiences in terms of their engagement in-class communication in English. The anonymity is guaranteed. No personal identifiers will appear in any documents, reports. The names of the participants will not be revealed; a number will be assigned to each participant. However, there may occur some minor risks concerning the participants' time that they will spend for the interview. Therefore, the researcher is going to discuss with the class teacher and participants the most convenient time and place for conducting the interviews. The benefits which may reasonably be expected to result from this study are that students will gain experience in participating in the research study which will enable them to express their view, realize that their voice is important, and think about their learning. The findings of this research can also give mainstream school teachers and stakeholders in Kazakhstan some useful insights into students' language learning experiences and maybe challenges within the trilingual educational system.

TIME INVOLVEMENT:
The study will be conducted in December and the procedure will be carried out within two weeks. The questionnaire will take 15 min and interview 30 min.

SUBJECT'S RIGHTS:
If you have read this form and have decided to allow students to participate in this study, please understand students' participation is voluntary and every student has the right to withdraw his/her consent or discontinue participation at any time without penalty or loss of benefits to which he/she is otherwise entitled. Students have the right

to refuse to answer particular questions. The results of this research study may be presented at scientific or professional meetings or published in scientific journals.

CONTACT INFORMATION:

Questions: If you have any questions, concerns or complaints about this research, its procedures, risks, and benefits, you should ask the Master's thesis Supervisor - Anas Hajar, anas.hajar@nu.edu.kz and tel. + 70 93 90, + 69 49 70

Independent Contact*:* If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the NUGSE Research Committee at gse_researchcommittee@nu.edu.kz

Please sign this consent form if you agree to students' participation in this study.

- I have carefully read the information provided;
- I have been given full information regarding the purpose and procedures of the study;
- I understand how the data collected will be used, and that any confidential information will be seen only by the researchers and will not be revealed to anyone else;
- I understand that students are free to withdraw from the study at any time without giving a reason;
- With full knowledge of all the foregoing, I agree to students' participation in this study.

_____ _____

Signature Date

The extra copy of this signed and dated consent form is for you to keep.

ЗЕРТТЕУ ЖҰМЫСЫ КЕЛІСІМІНІҢ АҚПАРАТТЫҚ ФОРМАСЫ
Мектеп директоры үшін

Қазақстандық орта мектеп студенттердің STEM пәндері сабағында ағылшын тілінде сөйлесуге дайындығын түсіну

СИПАТТАМА:
Бұл зерттеу жұмысы Назарбаев Университетінің Жоғары білім беру мектебінің Зерттеу Комитетімен мақұлданды. Сізді Қазақстандық орта мектеп оқушыларының жаратылыстану-математикалық бағыттағы (STEM) пәндері сабағында ағылшын тілінде сөйлесуге дайындығына әсер ететін негізгі факторлары қарастырылатын зерттеуге қатысуға шақырамыз. 9-шы сынып оқушыларына сыныпта сауалнаманы толтыруға және аудиоға жазуына рұқсаты алынған бетпе-бет сұхбаттқа қатысу ұсынылады. Олардың анонимділігі және құпиялылығы қорғалатын болады, өйткені қатысушылардың есімдері өзгертілетін болады. Сонымен қатар, аудиоға жазылған сұхбаттар қауіпсіз жерде сақталады және бірнеше жылдан кейін жойылады. Талдау барысында тек қана кеңесші мен зерттеуші деректерді қолдана алады. Сұхбаттасу басталған соң оқушылар орынсыз деп санаған сұрақтарға жауап бермеуге мүмкіндігі бар.

ЗЕРТТЕУ ЖҰМЫСЫНА ҚАТЫСУДЫҢ ҚАУІПТЕРІМЕН АРТЫҚШЫЛЫҚТАРЫ:
Зерттеу жұмысына қатысудың қауіптері шамалы. Зерттеу оқушыларды немесе мектепті сынау мақсатында өткізілмейді, тек сабақ барысындағы студенттердің ағылшын тіліндегі қарым-қатынасы туралы жалпы түсінік қалыптастыру үшін. Зерттеу толық анонимді болып табылады. Еш жерде оқушының, ақпараты аталмайтын болады. Ал жиналған ақпаратты талдау барысында, әр оқушыға жеке нөмір тағайындалатын болады. Алайда, қатысушылардың сұхбаттасуға кететін уақытына қатысты бірнеше бөгет туындауы мүмкін. Сондықтан зерттеуші сынып жетекшісімен және қатысушылармен сұхбат жүргізудің ең қолайлы уақыты мен орны талқыланатын болады. Оқушылардың ғылыми-зерттеу жұмысына қатысуда тәжірибе жинақтауы, өз көзқарастарын білдіруі, пікірлерінің маңызды екенін түсінуі және өздерінің оқуы туралы ойлануға мүмкіндігі осының бәрі зерттеудің нәтижесі бойынша қалыптасқан артықшылық деп білуге болады. Зерттеу нәтижелері Қазақстан білім саласының қызметкерлеріне оқушылардың тілді үйренудегі тәжірибесі туралы пайдалы түсініктер мен үштілді білім беру жүйесіндегі қиындықтарды анықтауға септігін тигізетін болады деп күтіледі.

ӨТКІЗІЛЕТІН УАҚЫТЫ:
Зерттеу желтоқсан айында өтеді және зерттеу жұмысы аясындағы рәсімдер екі апта ішінде өткізілетін болады.Сауалнама сұрақтарына жауап беру шамамен 15 минут уақыт алады, ал сұхбат 30 минут.

ҚАТЫСУШЫ ҚҰҚЫҚТАРЫ:
Егер Сіз берілген формамен танысып және оқушыларға зерттеу жұмысына қатысуға шешім қабылдасаңыз, оқушылардың қатысуы ерікті түрде екенін хабарлаймыз. Сонымен қатар, әрбір оқушы кез келген уақытта зерттеу жұмысына қатысу туралы келісімін кері қайтаруға немесе тоқтатуға құқығы бар.

Оқушылардың зерттеу жұмысына мүлдем қатыспауына да толық құқығы бар. Сондай-ақ, оқушыларға қандай да бір сұрақтарға жауап бермеулеріне де әбден болады. Оқушының жеке ақпараттары зерттеудің барлық жарияланған және жазбаша мәліметтерінде құпиялы түрде сақталынады.

БАЙЛАНЫС АҚПАРАТЫ:

Сұрақтарыңыз: Егер Егер жүргізіліп отырған зерттеу жұмысының процесі, қаупі мен артықшылықтары туралы сұрағыңыз немесе шағымыңыз болса, келесі байланыс құралдары арқылы зерттеу жұмысының жетекшісімен хабарласуыңызға болады. Анас Хаджар, Назарбаев Университетінің Жоғары білім беру мектебінің профессоры, anas.hajar@nu.edu.kz, тел.: + 70 93 90, + 69 49 70 (жұм)

Дербес байланыс ақпараттары: Егер берілген зерттеу жұмысының жүргізілуімен қанағаттанбасаңыз немесе сұрақтарыңыз бен шағымдарыңыз болса, Назарбаев Университеті Жоғары Білім беру мектебінің Зерттеу Комитетімен көрсетілген электрондық пошта gse_researchcommittee@nu.edu.kz жазуыңыз болады.

Зерттеу жұмысына оқушылардың қатысуына келісіміңізді берсеңіз, берілген формаға қол қоюыңызды сұраймыз.

• Мен берілген формамен мұқият таныстым;
• Маған зерттеу жұмысының мақсаты мен оның процедурасы жайында толық ақпарат берілді;
• Жинақталған ақпарат пен құпия мәліметтерге тек зерттеушінің өзіне қолжетімді және мәлім болатынын толық түсінемін;
• Мен оқушылардың кез келген уақытта ешқандай түсініктемесіз зерттеу жұмысына қатысудан бас тартуына болатынын түсінемін;
• Мен жоғарыда аталып өткен ақпаратты саналы түрде қабылдап, оқушылардың осы зерттеу жұмысына қатысатындығына келісемін.

Қолы: _____ Күні: _____

Форманың бір данасы Сізде қалады

ФОРМА ИНФОРМАЦИОННОГО СОГЛАСИЯ

для директора школы

Понимание готовности казахстанских учащихся старших классов общаться на английском языке на уроках STEM предметов

ОПИСАНИЕ:

Данное исследование было одобрено Исследовательским комитетом Высшей школы образования Назарбаев Университета. Вам предлагается принять участие в исследовании по основным факторам, влияющим на готовность казахстанских учащихся общаться на английском языке на уроках предметов естественно-математического направления (STEM) в старших классах средней школы. Учащимся 9 классов будет предложено заполнить анкету в классе и с разрешением на аудио записать принять участие в интервью. Их анонимность и конфиденциальность будут защищены, поскольку вместо имен будут использоваться псевдонимы. Кроме того, аудиозаписи будут храниться в безопасном месте и будут удалены через пару лет. В процессе анализа только куратор проекта и исследователь имеют доступ к данным. Во время собеседования, у учащихся есть возможность не отвечать на любой из вопросов, которые они сочтут неуместными.

РИСКИ И ПРЕИМУЩЕСТВА:

Риски, связанные с исследованием: минимальны. Исследование не проводиться в целях критики или осуждения учащихся или школы, а для того, чтобы развить общее представление о том, как ученики воспринимают свое общение в классе на английском языке. Анонимность исследования гарантирована. Никакие личные данные не будут упомянуты в любых формах отчета и презентаций результатов. Имена участников не будут разглашены; к каждому ученику будет присвоена определенный номер. Тем не менее, есть некоторые незначительные риски, связанные со временем участников, которое они потратят на интервью. В связи с этим, исследователь собирается обсудить с преподавателем и участниками время и место для проведения интервью. Преимущества, которые можно ожидать в результате этого исследования, заключаются в том, учащиеся получат опыт участия в исследовании, что позволит им убедиться о важности их мнения, выразить свое мнение и поразмыслить о своем обучений. Результаты исследование позволят заинтересованным сторонам в образовании в Казахстане лучше ознакомиться с опытом изучения языка учащихся и, возможно, с проблемами в системе трехъязычного образования тоже.

ВРЕМЯ УЧАСТИЯ:

Исследование проводится в декабре и процедура сбора данных будет осуществлена в течение двух недель. Анкетирование займет примерно 15 минут, интервью - 30 минут.

ПРАВА УЧАСТНИКОВ:

Если Вы прочитали данную форму и разрешили учащимся принять участие в данном исследовании, Вы должны понимать, что участие учащихся является добровольным и что у них есть право отозвать свое согласие или прекратить участие в любое время без штрафных санкций и без потери социального пакета,

который им предоставляли. Также учащийся имеет право отказаться отвечать на конкретные вопросы. Индивидуальная конфиденциальность учащегося будет сохраняться во всех опубликованных и письменных данных, полученных в результате исследования.

КОНТАКТНАЯ ИНФОРМАЦИЯ:

Вопросы: Если у Вас есть вопросы, замечания или жалобы по поводу данного исследования, процедуры его проведения, рисков и преимуществ, Вы можете связаться с научным руководителем магистерской работы, используя следующие данные: Анас Хаджар, anas.hajar@nu.edu.kz и тел. + 70 93 90, + 69 49 70.

Независимые контакты: Если Вы не удовлетворены проведением данного исследования, если у Вас возникли какие-либо проблемы, жалобы или вопросы, Вы можете отправить письмо Комитету Исследований Высшей Школы Образования Назарбаев Университета на электронный адрес gse_researchcommittee@nu.edu.kz

Пожалуйста, подпишите данную форму согласия, если Вы согласны на участие учащихся в этом исследовании.

• Я внимательно изучил (а) предоставленную информацию;
• Мне предоставили полную информацию о целях и процедуре исследования;
• Я понимаю, как будут использованы собранные данные, и что доступ к любой конфиденциальной информации будет иметь только исследователь, и не будет открыта кому-либо еще;
• Я понимаю, что учащиеся вправе в любой момент отказаться от участия в данном исследовании без объяснения причин;
• С полным осознанием всего вышеизложенного я согласен (на) на участие учащихся в этом исследовании.

_____ _____

Подпись Дата

Копия этой подписанной и датированной формы согласия остается вам