Self-directed learning in Kazakhstani schools for talented and gifted students

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ABSTRACT

The concept of lifelong learning has been on the minds of many educators for several decades. In order to be a lifelong learner, one must possess the skills and competencies to pursue one's own self-education. Such skills and competencies are often referred to as self-directed learning (SDL) skills. SDL skills are a set of abilities and characteristics that include taking responsibility for one's own learning, being motivated to learn and allocate time for learning, being able to find and manage information, assess learning outcomes and/or learning resources, and applying learning strategies to one's own learning. This exploratory study was conducted to investigate the current situation concerning SDL in Kazakhstani high schools for talented and gifted pupils and to determine the current level SDL skills of both high-school students and teachers. For this purpose, the Self-Directed Learning Skills Scale (SDLSS), developed by Ayyildiz and Tarhan (2015), was adapted to the Kazakhstani context. Twenty-one schools for talented and gifted children located in all regions of Kazakhstan were chosen for this study, and a survey questionnaire was administered to a sample of educators (N = 661) and high-school students (N = 205). The results showed that the students' scored lower on SDL skills in comparison to educators. The difference was found to be significant and the effect size modest. It was also found that females (students and educators combined) scored higher on several SDL skills than males. The least developed SDL skill for both respondent groups was the *ability to manage information*. These results suggest that educational leaders should strive to create learning conditions that are conducive to the development of SDL skills in secondary schools by providing the necessary training where the focus is on students and teachers acquiring the skills that enhance their abilities to set their own learning objectives, manage incoming information, assess resources and learning outcomes, and utilize learning strategies.

Тақырыбы: Дарынды оқушыларға арналған Қазақстан мектептеріндегі өздігінен бағытталған оқыту

АҢДАТПА

Өмір бойы білім алу тұжырымдамасы бірнеше жылдар бойы көптеген педагогтардың ойында жүр. Өмір бойы білім алу үшін өзін-өзі дамыта алатын дағдылар мен құзыреттерге ие болу керек. Мұндай дағдылар мен құзыреттер көбінесе өздігінен бағытталған оқыту деп аталады. Өздігінен бағытталған оқыту дағдылары бұл өзіңіздің оқуыңызға жауапкершілік ала отырып, оқуға уақыт бөлуге, ақпаратты табуға және басқаруға, оқу нәтижелерін және / немесе оқу ресурстарын бағалауға және оқыту стратегияларын қолдануға бағытталған ынталандыруды қамтитын қабілеттер мен сипаттамалар жиынтығы болып табылады. Берілген зерттеу жұмысы дарынды оқушыларға арналған қазақстандық орта мектептердегі өздігінен бағытталған оқытудың қалыптасу деңгейін зерттеу, сондай-ақ жоғарғы сынып оқушыларының және мұғалімдердің өздігінен бағытталған оқыту дағдыларының деңгейін анықтау барысында жүргізілді. Осы мақсатта Аййылдыз және Тархан(2015) әзірлеген «Өздігінен бағытталған оқыту дағдылары шкаласы» (SDLSS) атты зерттеу құралы қазақстандық контекстке бейімделді. Зерттеуге Қазақстанның барлық аймақтарында орналасқан дарынды балаларға арналған жалпы саны 21 мектеп таңдап алынды. Сауалнамаға 661 мұғалім мен 205 жоғары сынып оқушылары қатысты. Зерттеу нәтижелері оқушылардың мұғалімдерге қарағанда өздігінен бағытталған оқыту дағдыларының төмен екенін көрсетті. Бұл айырмашылық статистикалық тұрғыдан маңызды деп танылғанымен көлемі жағынан қарапайым екені анықталды. Сондай-ақ, әйел адамдардың (оқушылар мен мұғалімдер біріккен) өздігіен бағытталған оқытудың бірнеше

дағдылар бойынша көрсеткіштері ер адамдарға қарағанда жоғары болды. Респонденттердің екі тобында да өздігінен бағытталған оқыту дағдыларының ішінде ең төмен дамыған түрі ақпаратты басқару қабілеттілігі болды. Бұл нәтижелер білім беру көшбасшыларының орта білім беру мектептерінде өздігінен бағытталған оқыту дағдыларын дамытуға ықпал ететін оқу орталарын құруды ұсынады. Бұл ортада оқушылар мен мұғалімдердің өздерінің оқу мақсаттарын анықтауға, жаңа ақпаратты басқаруға, ресурстарды бағалауға және оқу нәтижелерін бағалауға және оқыту стратегияларын пайдалануға мүмкіндік беретін дағдылар қалыптасады.

Название: Самостоятельное обучение в Казахстанских школах для талантливых и одаренных учеников

АННОТАЦИЯ

В течение последних десятилетий, концепция обучения на протяжении всей жизни захватила умы многих педагогов. Для того, чтобы обучаться на протяжении всей жизни, необходимо обладать навыками и компетенциями для самостоятельного обучения. Такие навыки часто называют навыками самостоятельного обучения.

Навыки самостоятельного обучения это набор способностей и характеристик, которые включают в себя принятие ответственности за собственное обучение, мотивацию к обучению и выделение времени для обучения, способность находить и управлять информацией, оценивать результаты обучения и/или учебные ресурсы и применять стратегии обучения. Это исследование было проведено с целью изучения текущей ситуации с самостоятельным обучением в казахстанских школах для талантливых и одаренных учеников и определением текущего уровня навыков самостоятельного обучения как у старшеклассников, так и у учителей. Для этого, Шкала Навыков Самостоятельного Обучения (SDLSS), разработанная Айилдыз и Тархан (2015), была адаптирована к казахстанскому контексту. Двадцать одна школа для талантливых и одаренных детей, расположенные во всех регионах Казахстана, были выбраны для этого исследования. Опрос прошли 661 педагог и 205 учащихся старших классов. Учащиеся показали более низкие баллы по навыкам самостоятельного обучения по сравнению с педагогами. Было установлено, что разница значительна (со статистической точки зрения), но величина разницы мала. Было также установлено, что женщины (учащиеся и

преподаватели взятые вместе) набрали больше баллов по нескольким навыкам самостоятельного обучения, чем мужчины. Наименее развитым навыком самостоятельного обучения обеих групп респондентов была способность управлять информацией. Эти результаты свидетельствуют о том, что образовательные лидеры должны стремиться создавать условия обучения, способствующие развитию навыков самостоятельного обучения в средних школах, обеспечивая необходимую подготовку, где основное внимание уделяется навыкам, которые расширяют способности учеников и учителей определять собственные цели обучения, управлять поступающей информацией, оценивать ресурсы и результаты обучения и использовать стратегии обучения.

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CHAPTER I: INTRODUCTION

Some 2500 years ago, the Greek philosopher Heraclitus made one of his famous assertions that change is the only constant in life (*panta rhei* in Greek) (Mark, 2010). In today's era, this saying can resonate with every person in most areas of the globe because, nowadays, the speed of change accelerates from decade to decade. Prior to the first quarter of the 20th century, the lifespan of a person was longer than the time-span of a major cultural change (Whitehead, as cited in Knowles, 1972). According to Whitehead, whereas a person of that era could learn one trade and work at the same job for 20 to 40 years, in today's world, one's knowledge and skills may become obsolete several times during her or his lifetime because the conditions under which people work, change due to ever-increasing global competition and the speed of technological development. If before it was common and appropriate to regard teachers and schools as transmitters of information and to regard education as an agency for youth, in today's world, teachers must prepare students to adapt to such frequent changes.

Because of the emergence of new occupations and careers, the explosion of knowledge and technology, the continual shift to an information society, the competing influences of specialization and professional interdependence, and increasing internationalization, there are many pressures for continued learning to occur after graduation (Candy, Crebert, & O'Leary, 1994). Informal education, or education outside of a formal setting, is becoming more popular these days. The emergence of Massive Open Online Courses is the result of technological advancement, as well as the need for people to exceed, excel and compete on a higher level with one another. Learning from YouTube videos is another popular way to quickly learn a new skill or reduce one's knowledge gap. Any such learning requires self-directedness, the motivation to learn, the identification of a knowledge gap, being aware of information sources, and monitoring,

regulating, and evaluating one's own learning (Bonk & Lee, 2017). These are all the traits of a self-directed learner. This is the era where self-directed lifelong learning has become extremely vital to the development of human capital. Furthermore, it has been found that self-directed lifelong learning can improve not only wealth, employment opportunities, and job performance, but also civic participation, the development of local communities, and people's overall health (Guglielmino & Guglielmino, 2006; Tuckett, 2017; UNESCO Institute for Lifelong Learning, 2016).

Even though the terms "self-directed learning" and "lifelong learning" often appear together in the literature, the two concepts are distinct from one another. The relationship between *self-directed learning* and *lifelong learning* can be described as a "reciprocal", as Candy puts it (1991). In order to pursue lifelong learning one must possess skills and competencies to pursue own "self-education". Here, self-directed learning is the means to reach lifelong learning.

This quantitative study will focus on self-directed learning and self-directed learning skills in order to find out how well Kazakhstanis are prepared for lifelong learning. Further sections of this chapter will focus on the research problem, research aims, research question, and significance of the study.

Research Problem

One of the chief prerequisites of lifelong learning is having a set of self-directed learning skills (Knowles, 1975). For national economies and the individuals residing therein, self-directed learning has become the means of successfully transitioning towards the modern reality of global competition. Those with "know-how", have a competitive edge. As a result, many European countries (European Commission, Cedefop, & ICF International, 2014), as well such countries

such as Australia (Watson, 2013), China (Mok et.al, 2007), Singapore (Bound, Lin, & Rushbrook, 2014), as well as international organizations like UNESCO Institute for Lifelong Learning (2016) have placed lifelong learning and continuing education at the core of their education systems and policies. A great many books and articles have been published on the topic of self-directed learning, autonomous learning, independent learning, and lifelong education, and this has prompted even more educational institutions to promote self-directed and lifelong learning. Yew Wah International Education School (n.d.) in China, Kiel International School (n.d.) in Germany, Ecolint Institute of Learning and Teaching (n.d.) in Switzerland, and Knowledge Gate International School (n.d.) in Norway are just a few examples of institutions that uphold the philosophy of lifelong learning.

The government of Kazakhstan has also caught up with the concept of quality education and lifelong learning being a prerequisite to the development of its human capital, which would foster economic competitiveness of the country internationally (Bridges & Sagintayeva, 2014; Ministry of Education and Science, 2010). According to new educational standards in Kazakhstan, "school leavers should be able to search for and make meaning of information, be able to demonstrate critical thinking, and have skills for teamwork and independent lifelong learning" (Bridges & Sagintayeva, 2014, p. xxviii). But how do we know school students are being taught the skills necessary for lifelong learning or that favorable conditions are created? No such studies on SDL have yet been conducted in the Kazakhstani context. The only reference to self-directedness in learning that can be found in Kazakhstani literature pertains to lifelong learning. For example, at the beginning of the twenty first century, the Asian Development Bank (2004) reported that the Kazakhstani school curriculum was falling short of the goal to enhance the type of learning skills that render learning a lifelong pursuit. Indeed, the creation of the

conditions necessary for lifelong learning to occur in individuals is one of the key policy measures of the State Program of Education Development in the Republic of Kazakhstan for 2011-2020 (SPED) (OECD, 2014), however, no clear steps have been outlined on how to achieve this all-encompassing goal. The latest SPED (Ministry of Education and Science, 2010) statement is as follows:

> The entire population regardless of age and social status will be able to acquire and improve the basic skills through various forms of teaching in technical and vocational education, higher education and those provided by private suppliers of educational services (distance learning, short-term refresher courses, formal, informal, inclusive). (p. 50)

This quote demonstrates that Kazakhstani policy makers are focused more on creating institutions that disseminate knowledge, rather than on learners' development of skills necessary for lifelong learning. This is a remnant of the Soviet legacy and its teacher-centered approach that is still being applied in many educational institutions of Kazakhstan.

A sound educational policy shall be grounded in research. When it comes to the research on SDL, there is a big gap in studies conducted among children of school age. While the majority of the research on SDL has been directed towards adult populations (Curry, Mynard, Noguchi, & Watkins, 2017; Ginnings & Ponton, 2017; McCarthy & James, 2017; Plews, 2017; Ponton, 2018; Van Duyne, 2017), there are only a few studies focused on school pupils (Bartholomew, 2017; Tough, 1971).

It is important to conduct SDL studies not only among adults, but among school students as well, for at least two reasons. First, scholars from the Institute of Psychology of the University of Szeged and the Department of Cognitive Science of Central European University in Hungary found that "acquiring new skills is significantly more effective until early adolescence than later in life" (Janacsek, Fiser, & Nemeth, 2012, p. 496). Second, one of the main predictors of engagement in learning throughout adulthood is early participation which takes place during school age (Tuckett, 2017). Therefore, fostering the development of SDL skills from an early age is vital to ensure that school leavers enter adulthood with the ability to learn independently throughout their lives. Consequently, this study is aimed at investigating the current state of self-directed learning in Kazakhstani high schools. To do this, the study will measure the level of school students' and educators' SDL skills, in order to provide an insight as to whether the learners, both children and adults, possess the necessary skills for the pursuit of lifelong learning.

Purpose of the Study

The purpose of this study to measure the level of self-directed learning skills of teachers and senior-year high-school students in a network of schools for gifted and talented students in Kazakhstan. This is necessary in order to determine adolescents' and adults' preparedness for lifelong learning within Kazakhstani context.

Research Question

Self-directed learning is a broad concept, with multiple definitions and interpretations in the body of literature. This study focuses on self-directed learning skills and defines them as a set

of abilities and characteristics, such as taking responsibility for one's own learning, being motivated to learn and allocate time for learning, being able to manage information, assess learning outcomes and/or learning resources, apply learning strategies, and find information. Taking into account the broadness of the concept and the aims of the research, the main research question of this study is: "What is the level of self-directed learning skills among educators and senior-year high-school students in a network of schools for gifted and talented students in Kazakhstan?" This is an exploratory study seeking to investigate the SDL situation in the schools for talented and gifted children, whose mission is to promote lifelong learning.

Significance of Study

Taking into account the fact that self-directed learning (SDL) is an understudied subject in the context of secondary education and has not been studied at all in the context of Kazakhstan, this study can provide additional and significant data to the worldwide body of SDL research. The results can also be interpreted and used by education leaders, teachers, and parents of pupils in order to make the necessary deductions about the current level of high-school students' and educators' SDL skills and make appropriate adjustments to teaching practices. Schools may use an adapted form of the survey to conduct internal studies measuring students' levels of SDL skills year after year in order to track their progress. Moreover, school leaders will be able to ascertain the current levels of SDL skills among teachers, which will be helpful in deciding which skills will need further improvement and what training programs to sign teachers up for. Once adapted to various contexts, this survey, which is available in three languages (English, Russian and Kazakh), may be used internationally within various secondary educational contexts in order to diagnose teachers' and students' levels of SDL skills. In

conclusion, the results of this study can benefit for all stakeholders of self-directed and lifelong learning: teachers, pupils, parents, school leaders, and research community.

CHAPTER II: LITERATURE REVIEW

The aim of this research is to measure the level of self-directed learning skills of teachers and senior-year high-school students in a network of schools for gifted and talented pupils in Kazakhstan. Therefore, this literature review will focus on providing a definition of the concept of self-directed learning (SDL), the measurement tools that are being used for determining the level of SDL skills or preparedness/readiness for it on the part of teachers and students, and the studies that have been conducted among school children or adolescents and adults.

Concept of Self-directed Learning and Self-directed Learning Skills

The concept of self-directed learning (SDL) is associated with a variety of terms such as autonomous learning, independent study, self-education, andragogy, self-planned learning, learning to learn, lifelong learning and auto-didacticism (Candy, 1991; Guiter, 2014). The genesis of the concept may be attributed to John Dewey (1929), an American educator and philosopher, and Alfred North Whitehead, an English mathematician and philosopher. Both Dewey and Whitehead believed that it was impossible to prepare children for any precise set of conditions because of the changing nature of life (Dewey, 1929; Whitehead as cited in Knowles, 1972). They both argued that the main role of educators was to afford children with the responsibility for developing their own potential and facilitating their self-directed inquiry.

The concept of self-directed learning was further clarified in the second part of the twentieth century through the work of the humanist psychologist Carl Rogers, the educator and researcher Allan Tough and a prominent adult educator, Malcolm Knowles. In his book *Freedom to Learn*, Rogers (as cited in Jahns, 1971) proposed ways of promoting self-directed learning

among learners of all ages. He argued that the encouragement of learners' participation in the selection of their goals and ways to reach them and creation of situations that resemble reality, where learners can adjust to change, were the ways of promoting freedom in learning, which is the crux of SDL.

Allan Tough, on the other hand, conducted a study in the 70s, during which he and his group of researchers interviewed ten-year-old children, 16-year-old adolescents, and working adults. The aim of Tough's (1971) study was to discover how often and how important "learning projects" are for children, adolescents and adults. A "learning project" is defined as "a major, highly deliberate effort to gain certain knowledge and skill (or to change in some other way)" (Tough, 1971, p. 1). Learning sessions had to be connected to one another and consist of no less than seven hours to be called a "learning project". He found that almost every person interviewed pursued at least one or two learning projects per year. Yet, for some individuals, this number was as high as 15-20 projects yearly. These people spent as little as 100 hours and as much as 2000 hours per year learning something they were interested in. It is believed that within five years of the release of Tough's 1971 book *The Adult's Learning Projects*, his study "sparked not less than 25 dissertations, theses, and independent research studies" (Mocker & Spear 1982, p.12 as cited in Candy, 1991). This was one of the most influential empirical studies that revealed the importance of learning for people outside of formal educational settings.

Knowles' (1972) short work *Toward a Model of Lifelong Education* also brought many educators' attention to the ever-changing world of education and the need to remodel older educational methodologies from that of knowledge transmission to a process of lifelong inquiry. He posited that when one left school, he/she had to have not only the foundation knowledge

provided by a course of learning but also the skills to successfully acquire new knowledge throughout his/her life. In fact, Knowles developed one of the most widely used definitions for self-directed learning. According to Knowles (1975), self-directed learning is a "process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (p. 18).

Knowles (1975) makes the case that self-directed learning is not an isolated activity; rather, it is made possible thanks to the help of educational resource providers like teachers, tutors, peers, librarians, and content experts. Anyone, such as a parent, sibling, friend, or colleague, can become a helper that contributes towards an individual's SDL. He also argued that maturity is the main independent factor that determines a person's need for self-direction in learning (or any other activity).

Newer research classified a self-directed person as one that is self-managing, self-monitoring and self-modifying (Costa & Kallick, 2004). A person is self-managing when he/she approaches a task with a clear goal, a plan, necessary background information. Additionally, such a person uses previous knowledge and experience, anticipates success indicators, and creates alternatives for accomplishing the desired results. On the other hand, a self-monitoring learner establishes strategies and monitors the progress, or lack thereof, of the project. The self-modifying person is different, still; s/he reflects, evaluates, analyzes and constructs meaning from experiences gained and applies this learning to her or his life. These categories of self-directed learners are somewhat similar to that of Knowles' in the sense that a self-directed learner is one

who has a goal and can implement appropriate learning strategies, and then evaluate the work that has been performed. However, Costa and Kallick's (2004) interpretation of a self-directed person goes even further because for them it is also someone who can apply any learned information to her or his life.

For over twenty years Hiemstra and Brockett (2012) conducted research on SDL and adult education. In 1991 they developed the PRO model of self-direction in learning (Brockett & Hiemstra, 1991) which was later redefined as the PPC model (Hiemstra & Brockett, 2012), which stands for "person – process – concept". "Person" includes individual characteristics such as creativity, motivation, life experience, resilience, previous education, enthusiasm, critical reflection and self-concept. "Process" encompasses learning skills, learning styles, evaluation abilities, and planning and organizational skills. "Context" means the environment in which a learner operates, which includes components such as the sociopolitical climate, culture, gender roles, organizational policies, and sexual orientation. This last component, namely Context, was added to the PPC model after taking into account twenty years of SDL research experience of the two scholars. This component was not part of the previous PRO model of SDL. The PPC model concurs with Candy's (1991) proposition that people exhibit different levels of SDL depending on the context they are functioning in.

As one can see, self-directed learning encompasses so many varying definitions. As Guiter (2014) rightfully put it:

> one consistent element in the majority of definitions of SDL is the importance of the learner's exercising control over all educational decisions: what should be the goals of a learning effort, what resources should be used, what methods will work best for the

> learner, and by what criteria the success of any learning effort should be judged are all decisions that are said to rest in the learner's hands. (para. 9)

On the other hand, one of the most recent definitions of a self-directed learner was formulated by Bartholomew. Bartholomew (2017) has reviewed the literature on SDL to date and summarized a self-directed learner as a curious and *self-sufficient* individual with a firm belief in his or her capacity to achieve set goals. Such an individual also possesses a strong desire to learn, and is self-motivated, creative, and able to set learning goals, manage his or her time and incorporate learning strategies. This definition of a self-directed learner differs from others in the sense that it also incorporates a learners' characteristics of self-efficacy and creativity. He also summarized the type of environment that encourages self-directedness in learning as well. According to Bartholomew's research, the presence of a problem to be solved, a positive classroom environment, a group work setting, the presence of technology, and computer literacy skills are the types of contexts that encourage SDL. However, the computer literacy skill, in my opinion, should fall under a self-directed learner characteristic, instead of a context.

Since Malcolm Knowles (1975) published the definition of SDL, which is the most cited, the concept underlying the nature of a self-directed learner as well as the context of learning environments has evolved and expanded. As this concept became more popular among educators, there were who some perceived SDL either as a goal or as a quality that may be present in a person, while others saw it as a teaching method and a learning process (Candy, 1991). Candy (1991) disapproved of this dualistic use of the concept stating that people frequently failed to distinguish these two phenomena, and that such "indiscriminate application of the term self-direction to both phenomena has done much to blur the distinction" (p.15).

Overall, while earlier models of SDL, such as that of Knowles (1975) and of Tough (1971) were "linear in nature and provided step-by-step processes for learners to become more self-directed in the learning process" (Plews, 2017, p. 41) and assumed that as learners matured they became more self-directed, later models of SDL incorporated the additional components of individual personality characteristics, the context, creativity and motivation. In fact, Candy (1991) was the first scholar to propose the idea that learners exhibit different levels of SDL in different contexts or environments. Subsequent studies (Bartholomew, 2017; Hiemstra & Brockett, 2012) incorporated the learning environment into their SDL models, thus making them more interactive. Moreover, self-directedness in learning was thought of being a characteristic of adults only (Knowles, 1975), but was it was proven that adolescents may be self-directed too (Bartholomew, 2017; Tough, 1971).

Having traced the evolution and development of the SDL concept, the proposed conceptual framework in this study is based on the findings in the literature review presented above: SDL skills are a set of abilities and characteristics, such as taking responsibility for one's own learning, being motivated to learn and allocate time for learning, being able to manage information, assess learning outcomes and/or learning resources, apply learning strategies, and find information. This definition does not take into account the learning environment or the context of a learner as later SDL models do. This is because the learning environment (a network of similar schools promoting the same mission), in which the research was conducted, was the same for all learners. It would only make sense to include "environment/context" in the conceptual framework if the study were conducted in different types of schools (e.g. urban, rural, mainstream, private, etc). The learning environment (research site) is further discussed in the Methodology chapter of this paper.

SDL Measuring Tools

There are various instruments to measuring SDL skills. For example, one of the most widely used tools for assessing SDL is the Self-Directed Learning Readiness Scale developed by Guglielmino (1977). It is a 58-item Likert scale tool and is mainly used among adults in business settings in order to see how people are ready to engage in pursuing self study at work. Later on it was renamed in Learning Preference Assessment (LPA).

Another instrument, the Self-Directed Learning Readiness Scale for Nursing Education, was developed by Fisher, King and Tague (2001). It was used among nursing students. Another scale called Self-Directed Learning Scale (SDLS), a 10-item instrument, was created by Lounsbury and Gibson in 2006 (Lounsbury, Levy, Park, Gibson, & Smith, 2009). SDLS was built on Brockett's (1983) conceptualization of self-directed learning as a trait whereby a learner engages in his/her own learning and takes responsibility for it in an autonomous, self-reliant manner without any direction or guidance from others. The reliability and validity of SDLS was evaluated in multiple studies (Zhoc & Chen, 2016; Demircioğlu et al., 2018) in the Chinese and Turkish contexts.

In 2007, Williamson (2007) developed a 60-item self-rating instrument to measure SDL. The tool measures the following five dimensions of SDL: an awareness of what constitutes a self-directed learner, the learning strategies a self-directed learner usually adopts, the learning activities a self-directed learner engages in, the evaluation of the learning process, and learners' interpersonal skills.

Several years later Ayyildiz and Tarhan (2015) developed Self-Directed Learning Skills Scale (SDLSS) based on other four other SDL measuring tools. SDLSS was tested on 255 high-

school students from Izmir, Turkey. The high reliability coefficients of the scale indicate that SDLSS is quite reliable for measuring SDL skills in high-school students. This study used SDLSS in order to adapt it for the Kazakhstani context and then calculate high-school students' and teachers' levels of SDL skills.

Due to the large number of tools available, it becomes challenging to list them all in one research project, therefore, I have attempted to present those that are more frequently used in the table below. The Table 1 shows the titles of the instruments, their developer(s) and the studies in which they have been employed.

Table 1. *SDL Measuring Tools Found in Literature*

SDL measuring tool	*Developer(s)*	*Studies conducted among*
1. Self-Directed Learning Readiness Scale (SDLRS) or Learning Preference Assessment (LPA)	Guglielmino (1977)	Adults in business setting, traditional and nontraditional undergraduate students, doctoral students, undergraduate teacher education students
2. A 42-item questionnaire that investigates teachers' and students' perceptions with regard to students' responsibilities and abilities related to autonomous learning and the autonomous activities students are engaged in and out of classroom	Ustunluoglu (2009) based on questionnaire used by Chan, Spratt and Humphreys (2002). That questionnaire, in turn, was based on inputs from Deci (1995), and Deci and Ryan (1985).	University students and instructors
3. Self-Directed Learning Readiness Scale (SDLRS) for Nursing Education	Fisher, King and Tague (2001)	Nursing students
4. Appraisal of Learner Autonomy (ALA)	Ponton, Derrick, Hall, Rhea, and Carr (2005).	Graduate students, doctoral students, professors
5. Self-Directed Learning Scale (SDLS)	Lounsbury and Gibson (2006)	Undergraduates
6. Self-Rating Scale of Self-Directed Learning (SRSSDL)	Williamson (2007)	Nursing students
7. Self-Directed Learning with Technology Scale (SDLTS) for K-12 students	Timothy, Seng Chee, Chwee Beng, Ching Sing, Joyce Hwee Ling, Wen Li, and Horn Mun (2010)	Middle-school students

8. Online Learning Readiness Survey (OLRS)	Dray, Lowenthal, Miszkiewicz, Ruiz-Primo, and Marczynski (2011)	Traditional and nontraditional undergraduate students
9. Teachers Opportunity to Learn (TOTL) instrument	Akiba (2012)	Middle- and high-school mathematics teachers
10. Self-Directed Learning Skills Scale (SDLSS)	Ayyildiz and Tarhan (2015)	High-school students

Source: Developed by the author of the thesis

As shown by this table, most of the SDL measuring tools were used among the adult population, who were either university students, educators, or adults working in other sectors, and only a fraction of studies were directed at school student populations. This proves there is a gap in research on SDL conducted among school-aged students. Which is why this study is trying to fill in that gap.

Studies on SDL

The research on SDL has been conducted among various groups of learners: adolescents or school students, adults or university students and even teachers or professors. This literature review section is divided into three sub-sections in order to group together studies on how age, gender and other demographic information affects SDL, studies on how different interventions affect SDL, and all other studies.

Studies on how age, gender and other demographic information affects SDL.

Firstly, Williamson (2007) tested SDL among undergraduate nursing students using the Self-Rating Scale of Self-Directed Learning (SRSSDL). The findings revealed that first-year university students had low levels of self-direction. However, the responses from another group of undergraduate students, who were in their final year, revealed that they were more self-

directed in their learning in comparison to the freshmen. Nevertheless, the practice of evaluating one's learning and using or developing the interpersonal skills necessary for effective learning were equally lacking in both freshmen and final-year students.

Carson (2012) conducted a study with 780 8th to 12th grade students enrolled in an online program to see if SDL (as a personal trait) differed according to gender, ethnicity, grade level and GPA. Carson use a 12-item survey, which he constructed by combining a 10-item Self-Directed Learning Inventory (SDLI) originally compiled by Lounsbury et. al (2009) and adding his own: "I do not need much help to complete my homework" and "Taking charge of my own learning is very important for success in my school and future career." (p. 158). He concluded that SDL did not differ among students of different ethnicities or gender. There was a statistically significant difference in SDL according to grade level and overall GPA implying that the personal trait (SDL) differs by age (the older a person, the higher is SDL score) and can predict GPA.

Another SDL study was conducted by Slater, Cusick and Louie (2017), where they investigated relationships between self-directed learning readiness and gender, age, program of study, previous education, and personality characteristics. The Self-Directed Learning Readiness Scale (Guglielmino, 1977) with a 50-item personality trait inventory were carried out with 584 first-year undergraduate students of health sciences. Slater et.al (2017) found that SDLR was significantly higher in females and students of occupational therapy and physiotherapy studies; and increased with age, higher levels of previous education, and higher levels within each of the Big Five personality traits (openness, agreeableness, conscientiousness, emotional stability, and extraversion). While each of the factors affecting SDLR had a modest relationship to it, "in

combination, personality traits and previous education level could account for half the variance" (Slater et.al, 2017, p. 8).

There is also one old SDL study that compared the adult's learning habits and adolescents'. In the 70s an adult educator Tough (1971) studied informal learning projects that were undertaken by adults in natural societal settings. He and his team interviewed 66 adults from the following socio-economic backgrounds: blue-collar factory workers, beginning elementary school teachers, social science professors, municipal politicians, mothers with preschool children, and women and men working in lower-end white-collar jobs. He and his team found that almost everyone undertook one or two major learning efforts a year and that it was common for a man or woman to spend 700 hours a year on learning efforts. Seventy percent of all learning projects were planned by the individuals themselves, while the rest were reliant on instructors, private lessons, or non-human sources. The group that spent the most hours on learning efforts were professors, (1500 hours on average), followed by politicians (1200 hours), lower-white-collar male workers (900 hours), factory workers (800 hours), lower-white-collar female workers (430 hours), elementary teachers (400 hours) and mothers with preschool children (330 hours). Assuming that in the seventies, professors, politicians and factory workers were predominantly male, it could be concluded that during that decade, females spent much less time on their learning efforts (330-430 hours per year) in comparison to males. Judging by the fact that women with preschool children spent the least number of hours on self-directed learning efforts (330 hours per year), it would be safe to assume that mothers have more home-based responsibilities and, therefore, less time to spend on self-directed learning than men.

Tough (1971) also conducted interviews about out-of-school learning with 10- and 16-year olds in order to compare their results with those of the adults'. He found that 16-year-olds conducted more learning projects than most adults, however, they only spent an average of 70 hours on each project. This suggests that adults can stay focused on a subject or can be committed to developing a skill for a longer period of time than adolescents. On the contrary, the learning efforts of the 10-year-olds differed greatly in comparison with adults'. For example, the children pursued a greater variety of subjects and attempted to obtain more skills than their adult counterparts. This can, firstly, be explained by the fact that children have a great deal to learn as opposed to adults, the latter of whom have become more selective in their areas of interest. Therefore, children's interests are more scattered. Secondly, these children's learning episodes were much shorter than those of the adults'. The children's attention spans could generally only be sustained during a 15-minute reading session, or by watching a 30-minute TV show. Exceptions to this state appeared when sports or expeditions were involved, which were enjoyed much more by the children of the study. Moreover, the children engaged in certain learning activities, such as sports or hobbies for the sake of enjoyment, and not for the sake of developing skills or acquiring knowledge. In addition, most of these children's out-of-school activities were influenced by their teachers through the classroom activities they set, the questions they raised during lessons, or the books they suggested. Overall, ten-year-old children initiated around six learning efforts per year, spending about 20 hours on each. As one can see, the 16-year-old adolescents spent much more time learning out of school than the 10-year-olds did. However, much of the efforts of the 16-year-old were devoted to sport activities, playing musical instruments, and other general topics of interest. Tough (1971) attributes the more sustained learning effort of the adolescents in his study to the fact that 16-year-olds have new

responsibilities to handle and problems to solve that are not faced by 10-year-olds. This may mean that if we entrust a 10-year-old with responsibilities, s/he might feel the urge to learn new things. One may conclude that as a person matures, his informal learning efforts become longer. This coincides with Knowles' observations about people's desire to be more independent and autonomous in their lives and to engage in lifelong learning as they become older (1975).

Studies on how different interventions affect SDL.

Ginnings and Ponton (2017) conducted an experimental study among two groups of doctoral students, who were enrolled in an online statistics course. They were divided into an experimental and a control group. Both groups were pretested on their self-efficacy in autonomous learning using the Appraisal of Learner Autonomy (ALA) developed by Ponton, Derrick, Hall, Rhea, and Carr (2005). The experimental group was then provided with a "treatment" that consisted of a video about strategies that are associated with the construct of autonomous learning, a discussion forum, where students could reflect upon their autonomous learning experiences, and finally, an email which students received in their inbox and helped them attribute their learning success to autonomous learning behaviors. Both groups sat final exam at the end of the course and took a posttest ALA. The results showed that the experimental group had an ALA score mean increase of 5.79 points and a SD decrease of 6.52 points, while the control group had an ALA score mean increase of 3.56 points and a SD increase of 1.52 points. This means that the students who underwent "treatment" had a better view of themselves as autonomous learners. Moreover, in the final examination, the experimental group scored six to seven points higher than the control group. This experiment showed that even low level

interventions, such as showing a video, having students reflect on their experiences and helping them realize that any success in their learning is actually the result of their autonomous learning, have an impact on people's self-efficacy in learning and results in higher examination scores.

Curry, Mynard, Noguchi, and Watkins (2017) conducted a study among Japanese freshmen students (18-19 years of age) who underwent a special course on self-directed language learning. This concept is similar to SDL; the only difference is that it is specifically directed at language learning as opposed to any other kind of learning. The goal of the study was to see whether students benefited from the course and were becoming more self-directed language learners as a result. Curry et. al used an end-of-course questionnaire, students' journals with weekly reflections, and end-of-course reports in order to analyze the efficacy of the course. The majority of students found the course to be very helpful and reported becoming more self-directed in their learning. However, it was also found that the students needed more support in learning how to select, use and evaluate resources and learning strategies. This research demonstrated that it was possible to teach SDL skills to freshmen university students but that being able to choose and utilize the most appropriate sources and learning strategies remained a challenge.

There is a limited number of studies on SDL among school students. One of these is Bartholomew's (2017) study of middle-school students' technological habits and their correlation to self-directed learning. Bartholomew (2017) recruited 706 middle-school students from a large suburban school district (over 75,000 students), who were mainly from a suburban middle class population. The study lasted for two weeks and covered five 90-minute class sessions. The pupils were divided into groups and were given an open-ended engineering design

challenge. Some groups received access to mobile devices and the Internet while others did not. Prior to and after the study, Bartholomew (2017) administered the six-item Self-Directed Learning with Technology Scale (SDLTS), which was specifically developed for K-12 students by researchers at Nanyang Technological University in 2010. The findings of the study showed that those who had access to mobile devices and the Internet displayed a higher level of self-directed learning than those who had not been given this opportunity. Moreover, it was found that those who spent most of their time playing video games and using social media showed lower levels of SDL. Furthermore, thirty students with varying performance levels were chosen for a semi-structured interview conducted by the six teachers recruited for the study. The interview results revealed that students view the current school structures, encompassing the curriculum, the class set-up, their teachers, and school rules as an obstacle to SDL development. An opinion students also shared with the teachers is that for some students, the use of technologies does lead to SDL, while for others it is just a medium for playing video games and using social media. This study showed that middle-school students are able to differentiate the kinds of technology use that could lead to SDL from those that will not. It also showed that in technology rich environment students are more able to engage in SDL to solve open-ended questions. This type of learning environment could be replicated in other schools in order to promote SDL, however, one should still take into account that with some students, this kind of learning environment will not prove efficient in promoting SDL skills.

On a different note, Golightly and Guglielmino (2015) decided to test whether problem-based learning (PBL) promotes SDL readiness among undergraduate teacher education students and their tutors, who were all final year students. The freshmen students underwent a six-week

PBL project that was integrated into a geography course. The study employed the Self-Directed Learning Readiness Scale/Learning Preference Assessment (SDLRS/ LPA) (Guglielmino, 1977) and aimed to discover whether there is a difference in the level of readiness for SDL between first year and final-year students after they have experienced PBL in one of their courses. 73 freshmen and 23 final-year students attending a university in South Africa responded to the 58-item, Likert scale instrument. Paired sample t-tests were conducted to compare the results on the SDLRS before and after the PBL component was introduced in the geography course. The results did not show any real statistical differences between the scores implying that PBL did not enhance the effectiveness of preparing students for SDL.

Other studies on SDL.

Plews (2017) conducted an exploratory case study among traditional and nontraditional undergraduate students in order to see how they define SDL and what factors ensured success in an online learning context. Traditional learners typically proceed with higher education right after high school, while nontraditional learners are those who postpone it because of having various responsibilities like family, work, and health, as well as other circumstances that are present in their lives. Therefore, the traditional learners in the study were those who are 18-22 years of age, while nontraditional learners were between 25-55 years of age. Plews (2017) administered two tools to identify the level of SDL preparedness of the participants: SDLRS developed by Guglielmino in 1977 and the Online Learning Readiness Survey (OLRS) developed by Dray, Lowenthal, Miszkiewicz, Ruiz-Primo, and Marczynski (2011). Out of 31 respondents, he chose only 20, those who showed higher than average results. Ten were from the

traditional learner group and ten from the nontraditional one. Those from the nontraditional learner group scored higher than the ones who were from the traditional group. This could be explained by the fact that the former group of learners was more mature and perhaps more motivated to learn. According to the results of the study, both groups of learners identified three factors that may have affected their success in the online learning environment: an awareness of one's own learning preferences, considering oneself technologically savvy, and being goal oriented. From this study, one may conclude that different learning environments require slightly different set of skills. For example, an online learning environment requires one to be technologically savvy, while more traditional learning environments may require one to be skillful at finding information using other methods.

Van Duyne (2017) conducted a study among doctoral students of three online programs. The purpose of the study was to determine whether the students' SDL scores differed according to their learning environment preferences, i.e. online versus traditional. Their SDL learning readiness was measured by SDLRS developed by Guglielmino (1977). The results did not reveal any statistical differences, which meant that doctoral students' SDL preparedness did not vary according to the type of learning environment they chose. However, the results of the survey did reveal that female students scored higher on SDL preparedness than their male counterparts, and elder students scored higher than younger ones.

When looking at studies conducted among teachers, McCarthy and James (2017) conducted an online survey among middle- and high-school mathematics teachers in order to understand their informal professional self-directed learning practices. Schools from two large districts in the US were solicited for this study. Both districts served rural, suburban and urban

student populations and were comprised of charter, traditional, virtual, alternative, K-8, vocational, and continuing education schools. The Teachers Opportunity to Learn (TOTL) survey instrument developed by Akiba (2012) was used. The results revealed that out of the four information learning practices that were investigated (teacher collaboration, mentoring/coaching, information communication and individual learning activities), individual learning activities reflected the highest participation (99.18%). Individual learning practices included reflecting on the practices of evaluating students' work, developing assessment tools to measure formative learning, and searching for resources to enrich both the curriculum and their instruction methods in the classroom. The teachers who took part in the current study were also engaged in such individual learning practices, however, it would be inaccurate to call such practices self-directed as these are activities that in the Kazakhstani context are mandated by the leadership of the schools. Tasks related to evaluating students' work, developing assessment tools, and enriching the curriculum are all part of a teacher's job in a Kazakhstani school for talented and gifted pupils. Therefore, what is coined as self-directed learning practice by McCarthy and James, is not be applicable to the Kazakhstani context, where it is obligatory.

A different kind of study was conducted in Japanese high schools. It used perceptions of teachers as the tool to explore SDL preparedness among students. As in Kazakhstan, the concept of SDL is relatively new in the educational institutions of that country. The governments of both countries are promoting this approach in order to ensure its students are prepared for the labor market of the twenty first century and to embark on lifelong learning projects. Aliponga, Koshiyama, Gamble, Yoshida, Wilkins, and Ando (2015) surveyed 251 English language high-school teachers from various schools in Japan. From this sample, 172 teach in mainstream

schools, while 79 teach in private schools. Aliponga et. al (2015) utilized Ustunluoglu's (2009) questionnaire in order to investigate teachers' perceptions with regard to students' responsibilities and abilities connected to autonomous learning and the autonomous activities students are engaged in when they are out of the classroom. It was found that the majority of Japanese teachers perceived that the performance of half of all classroom tasks related to autonomous learning were the responsibility of the teacher, and that the other half was the responsibility of both the teachers and the students. Hence, no tasks were the responsibility of only the students. As Aliponga et. al (2015) put it, the teachers in the study "may have failed to provide an environment where students could be involved in the performance of those autonomy-related classroom tasks" (p. 37). Such studies highlight environments with teacher-centered approaches, where a teacher is in control of the whole education process without letting the students be responsible for any part of their learning. Therefore, those institutions that strive to implement a new approach to teaching, such as SDL, should first study teachers' perceptions and attitudes towards the status quo.

On the other hand, Ponton (2018) conducted a study focusing on self-efficacy in autonomous learning among thirty professors of various disciplines at Regent University in the United States. The premise of that study rested on the assumption that the higher the level of education, the more self-directed learners are. Ponton used a 9-item Appraisal of Learner Autonomy (ALA), which was developed by Ponton, Derrick, Hall, Rhea, and Carr (2005, 2016) for this study, which failed to reveal a statistical difference between the scores of the professors and those more recent graduate degree holders who had participated in another previous study of Ponton and Carr (2016) two years earlier. The results suggest that even though professors spend

a large amount of time learning on their own, they mastered their self-directed learning skills during their graduate studies, and for the most part, the level of their SDL skills generally remain static h unchanged afterwards.

Hypothesis

Based on the literature review outlined in this chapter, this study's main hypothesis is that *the high-school students' level of SDL skills is lower than that of the educators'*. Four pieces of literature, in particular, helped to shape the hypothesis. They are:

(a) Knowles' theory, which states that self-direction in learning develops and grows with a person's maturity level (1975).

(b) A study conducted by Tough (1971), where he interviewed ten-year-old children, 16-year-old adolescents, and adults and discovered that adolescents are more self-directed in their learning compared to 10-year olds, and even engage in more learning projects than adults; however, the duration of the adolescents' projects were much shorter than those of the adults' of the study.

(c) Works of Candy (1991) and Hiemstra and Brockett (2012), which suggested that people exhibit different level of self-directedness depending on the environment/context where they function.

Conclusion of Literature Review

There are many definitions and interpretations of SDL, but they all include an element of self education with or without a facilitator. Most scholars agree that SDL skills encompass a set of abilities and characteristics. Even though the set of skills differ from one SDL model to

another, most models include the following components: learning responsibility and ability to plan one's learning, organize and manage time, choose learning resources, and evaluate the learning outcome. There are even more instruments that strive to measure one's SDL skills or preparedness for SDL. One of the widely used tools is SDLRS, which was developed by Guglielmino (1977). It is mainly used among adult populations to see whether people are ready to engage self education at work. Moreover, there are many other SDL measuring tools that are as good as SDLRS. This study will employ the SDLSS, a Likert scale instrument specifically developed for high-school students by Ayyildiz and Tarhan (2015). Because most of the SDL research studies are directed at adult populations and there is only a limited body of research focused on school student populations, this study will concentrate on the SDL skills of both teachers and high-school students that work in or attend a school for gifted and talented students. The following chapter will discuss the method that was used for conducting this exploratory study, the instrument used to collect data, the procedures followed when collecting the data, and information on respondents, population size, research site and sampling strategy.

CHAPTER III: METHODOLOGY

This study was conducted to determine the level of students' and educators' self-directed learning skills in schools for talented and gifted children. This chapter will describe the type of research design employed in this study, how research site and groups of respondents were chosen, what measuring tool was selected for the purpose of achieving the study's aims, how it was adapted and piloted, and how the data was collected and analyzed.

Research Design

This quantitative study employed a cross-sectional survey design using a questionnaire (Fowler, 2008, as cited in Creswell, 2014). The cross-sectional survey design serves the purpose of this quantitative study well because a survey provides numeric description of answers (Creswell, 2014) that can be used to compare results between different groups of respondents (Muijs, 2004).

Research Site

Kazakhstan has several networks of schools that specialize in teaching only gifted and talented pupils. One of such networks of schools was chosen for this study. The network is comprised of twenty-one schools located in all regions of Kazakhstan and attract the best students, teachers, and resources. In order to enter any of the schools a student or a teacher must first pass a competitive examination.

This networks of twenty-one schools was chosen for this study because these schools share the same goal and vision, which is to promote lifelong learning. Moreover, these schools enjoy a certain level of autonomy in the sense that teachers are able to adjust the curriculum to a

certain degree and principals can make decisions independently of central office when it comes to finances and operations of the schools. Therefore, it made sense to collect and compare data from a sample of students and teachers belonging to similar schools that are all promoting lifelong learning and have a certain degree of autonomy.

Population Size

The following statistics on the populations of respondents (see Table 2) was collected from the central office of the network of schools for talented and gifted children. The total number of educators is 3481, which includes teachers (both local and foreign), curators, librarians, vice principals and principals. The exact population size of the students above 18 years of age was unknown.

Table 2. *Breakdown of Educators and Number of Students*

Occupation	*N*
12th grade students (including those who are under legal age of 18)	2155
Teachers, local	2704
Teachers, foreign	180
Curators	407
Librarians	42
Vice principals	127
Principals	21

Source: Developed by the author of the thesis

Sampling Strategy

Twenty one Kazakhstani school for gifted and talented children were chosen for this study because these schools comprise a network of similar type of schools, which strive to prepare students for lifelong learning. This made it more convenient to collect data from one network of schools, needing only one permission to conduct an online survey in all the twenty

one schools. As the research aim was to find out the level of self-directed learning skills among teachers and senior-year high-school students, the first sample consisted of educators including school teachers, librarians, curators, vice principals and principals. The second sample consisted of high-school students who turned 18 by the time the survey was administered in April of 2019. As the schools provided free education for those who could pass a competitive entrance exam, the students in the sampling were of various socioeconomic and ethnic backgrounds, from rural and urban areas.

The study employed a census sampling method (Muijs, 2004), therefore everyone in these populations was asked to take part in the online questionnaire. Participation was voluntary and anonymous. Over the course of a week, 205 high-school students, who turned 18, and 661 educators responded fully to the survey. Moreover, 107 educators, 14%, started filling up the questionnaire but did not want to finish it for one reason or another. Their responses were not added to the dataset. The number of partial responses among high-school students is even higher: 221 (52% of total number of high-school students, who started filling up the survey, but did not finish). It can be explained by the fact that some students did not want to finish filling up the survey and some others were not 18 years of age and thus were redirected to the end message of the survey as soon as they indicated their real age.

Below you will find the statistics on the number of respondents, who fully completed the questionnaire, their gender and age and response rates of educators grouped by their occupations:

Table 3. *Breakdown of Educators by Age and Gender*

Age	*Gender*	*N*
18-27	Male	35
	Female	59
28-37	Male	88

Table 4. *Breakdown of High-School Students (18+) by Gender*

Gender	*N*
did not indicate gender	13

	Female	164
38-47	Male	34
	Female	123
48-57	Male	18
	Female	112
58-67	Male	5
	Female	23
	total:	661

Source: Developed by the author of the thesis

Male	68
Female	124
total:	205

Source: Developed by the author of the thesis

Out of 3481 educators (including teachers, librarians, curators, vice principals and principals) working in twenty-one schools for talented and gifted children, 18.9% responded to the survey (see Table 5). On the other hand, the response rate of students is impossible to calculate, because the exact number of 18-year-old high-school students is unknown.

Table 5. *Response Rates by Occupation of Educators*

		Frequency	*Valid %*	*Population*	*Response rate*
Valid	Teacher	559	85.1	2884	19%
	Curator	55	8.4	407	13.5%
	Librarian	7	1.1	42	16.7%
	Vice Principal	32	4.9	127	25%
	Principal	4	.6	21	19%
	Total	657	100.0	3481	18.9%
Missing	System	4			
Total		661			

Source: Developed by the author of the thesis

Instrument

Self-Directed Learning Skills Scale (SDLSS), a measuring tool developed by Ayyildiz and Tarhan (2015) (see Appendix A), was chosen among other SDL measuring tools in order to adapt it to Kazakhstani educational context. SDLSS is a Likert scale questionnaire. To develop it, Ayyildiz and Tarhan (2015) compared and analysed many SDL measuring tools. They chose four that formed the basis of SDLSS: Self-Directed Learning Readiness Scale (Guglielmino, 1977), Self Directed Learning Scale for Science and Technology Course (Aydede & Kesercioğlu, 2009), Self-Directed Learning Readiness Scale for Nursing Education (Fisher, King, & Tague, 2001), and Self-Rating Scale of Self-Directed Learning (Williamson, 2007). At first, Ayyildiz and Tarhan (2015) compiled a 47-item pilot version of the scale before conducting an item analysis, exploratory factor analysis and confirmatory factor analysis based on answers of 255 students from different high schools in Izmir, Turkey. The final version of the scale was comprised of 40 items and 9 factors such as an attitude towards learning, learning responsibility, motivation and self-confidence, ability to plan learning, ability to use learning opportunities, ability to manage information, ability to apply learning strategies, assessment of learning process, and evaluation of learning success/results. The highest score from an item is 5. The most positive opinion (Strongly Agree) gets 5 points. The most negative opinion (Strongly Disagree) gets 1 point. There are 8 negative items (6, 24, 26, 27, 34, 36, 38, 39) in the scale. Their scoring is done in reverse. It means that ‘Strongly Agree’ gets 1 point, Strongly Disagree gets 5 points. Maximum number of points 200.

SDLSS' Cohen's kappa coefficient is amounted to 0.71 while Cronbach's alpha reliability coefficient is 0.86. High reliability coefficients of the scale indicate that SDLSS is quite reliable for measuring SDL skills among high-school students.

Despite the tool's high reliability coefficients, Ayyildiz and Tarhan (2015) warned the readers of their work that SDLSS had to be validated in other countries and in other cultural contexts besides Turkey. The permission to use and adapt the tool was granted by Yıldızay Ayyildiz via an email in October, 2018. Then, the SDLSS was adapted to Kazakhstani context with the help of a panel of educators (panel of experts) and students.

At first, the SDLSS was translated to Russian and piloted among three high-school graduates of one of the participating schools. The focus group (Thomas, 2004) evaluated 40-items of the scale for comprehensibility, clarity, appropriateness of the language for the target audience and items' association with one of the nine factors of the scale. As the result of the focus group discussion, many items were rephrased to assure appropriateness of the language for a Kazakhstani high-school pupil context. Some items did not seem to belong to the factors they were assigned to initially, therefore, such items were matched with other factors in the list as per the suggestion of the members of the focus group.

Upon completion of the first piloting, the second piloting of the tool was conducted among a panel of experts: three high-school teachers from one of the participating schools. The experts well knew the concept of SDL, promoted it in their classrooms, had a teaching experience of 8, 9, and 11 years and had conducted research projects in the past. The scale was again evaluated for comprehensibility, clarity, appropriateness of the language for the target audience and items' association with one of the nine factors of the scale. A lot of items were restructured or rephrased and some were rematched with other factors in the scale.

Upon completion of both piloting tests conducted with the help of high-school graduates and teacher experts, a set of two questionnaires was prepared for two different groups of respondents. Two questionnaires, one directed at high-school students and another one directed at educators, are very similar to each other; the only difference is in choice of words selected for their appropriateness for each audience. For example, students were asked if they took notes on important points when learning a new lesson topic, while educators were asked if they took notes on important points/ideas when studying new material (educators do not have lessons per se, therefore the choice of words had to reflect that). Furthermore, demographic questions were added to both questionnaires asking respondents to indicate their age, gender, and school they working/studied in. Educators were asked what their job at the school was (teacher, curator, librarian, vice principal or principal). Then, with the help of language experts the questionnaires were translated to English and Kazakh and were inserted into Qualtrics, an online survey platform.

Data Collection Procedure

In December of 2018, I contacted the central office of the network of schools for talented and gifted pupils and received a written approval to conduct my research in the schools. In April of 2019 I sent out an email to the offices of twenty one principals providing details about my research and inviting them to participate. Web links to two adapted online questionnaires comprised of 40 items each were distributed among schools. The schools were asked to spread the links among appropriate groups of people. The participation in the survey was completely anonymous and voluntary. No names, emails, or other personal information were collected. Those students, who clicked on “did not reach 18”, were taken to the “thank you” page of the

survey without letting them answer any questions in the survey. The identities of participating schools are kept in strict confidence, meeting the requirements of the codes of ethics of the Nazarbayev University and the participating schools.

Some respondents complained that the tool was too long (40 items) and some questions were too similar to each other. More than 20% of people who started responding to the survey did not finish it. Moreover, some schools were completely unresponsive to the invitation to participate in the study. This can be explained by the fact that the first persons who got my email were secretaries of the school principals. When I called some of the unresponsive schools I found out that sometimes my message was not passed to anyone for different reasons (e.g., the secretary was on leave, the email never reached the recipient). Therefore, not all schools in the network were participating in this study. Overall it took me a week or so to collect full responses from educators (N = 661) and students (N = 205).

Post-Survey Dataset Adjustments

Upon finishing administering a set of two 40-item questionnaires to both groups of respondents, two datasets were downloaded from the Qualtrics platform and uploaded to SPSS. Before analyzing the data, the database was checked for errors and missing entries. All partially submitted responses as well outliers were removed from the dataset. All entries, pertaining to students who did not reach the age of 18, were removed (there was no information except for the name of the school they attended). The school information was coded and the names of the schools were removed. The two datasets were then merged into one. Respondents were coded in a way that it was possible to differentiate between students and educators. All school names were removed and coded.

Exploratory Factor Analysis and Internal Consistency and Reliability Tests

Following the collection of data, multiple exploratory factor analyses were performed on the 40-item SDLSS tool using SPSS. The factor analysis was a necessary step in further adapting the chosen data collection instrument (SDLSS) to Kazakhstani context and determining high-school students' and teachers' levels of SDL skills.

Factor analysis is a statistical technique, the purpose of which is to see if an inventory or scale has variables that cluster to form sub-scales or sub-constructs and to weed out variables that are extraneous, repetitive, or do not fit any of the sub-scales/sub-constructs (Muijs, 2004; Field, 2009). It gained popularity and acceptance among researchers in recent decades (George & Mallery, 2012). It was used by a British psychologist Raymond B. Cattell to group together 4500 personality traits names together. As a result he ended up with having only 200 questions that measured 16 different personality traits. He later called his inventory *16 Personality Factor Questionnaire* (16 PF Questionnaire). The factor analysis proved to be very useful in creating a structure of the questionnaire, identifying unobservable 16 constructs.

When performing the exploratory factor analyses in this study, different methods were used for factor rotation such as *oblique/oblimin, varimax*, and *quartimas* (Muijs, 2004). The most suitable rotation method for SDLSS was *oblique/oblimin* as it is especially suitable for variables that are correlated with one another. While the original tool consisted of nine sub-scales (Ayyildiz & Tarhan, 2015), the very first factor analysis performed for this study extracted only eight. At the same time, *Pattern Matrix* showed that thirteen variables loaded to multiple sub-scales, which was an undesirable outcome (Muijs, 2004). In order to reduce the number of variables that were loaded to too many different sub-scales, I limited the number of sub-scales to

seven in SPSS. As the result, the number of variables that had double loadings dropped from thirteen to nine variables, however, that was not good enough either. Therefore, the extracted sub-scales were further tested for internal consistency using Chronbach's alpha measurement.

Chronbach's alpha measures the strength of variables' correlation to each other within a sub-scale (Muijs, 2004). The higher the correlation, the higher is the internal consistency of a sub-scale or in other words, the higher the chance that the variables measure the same construct. Chronbach's alpha runs from 0 to 1, with 1 signifying the perfect relationship between variables and 0 signifying lack of any relationship. The rule of thumb is to have a Chronbach's alpha that is higher than 0.7 (Muijs, 2004). However, the is one big drawback in using this measurement: the Chronbach's alpha is very sensitive to the number of items in the scale. The higher the number of items in a scale, the higher Chronbach's alpha tends to be and vice a versa. So it is not a very subjective measurement. Nevertheless, the Chronbach's alphas were calculated to further weed some variables out.

Seven sub-scales were measured for internal consistency. Subscales consisted of 3-8 items. One of the sub-scales with a Chronbach's alpha of 0.371 was removed from the tool completely. As for the rest of the sub-scales, their Chronbach's alphas ranged from 0.564 to 0.835. Those sub-scales that consisted of three or four items had Chronbach's alpha lower than 0.7. It was to be expected given the sensitivity of Chronbach's alpha to the number of variables in a scale.

As the result of the first factor analysis and tests on internal consistency of sub-scales one sub-scale was removed from having low Chronbach's alpha. Moreover, a few items were removed for not being good fit (logically) for a sub-scale they ended up in. Consequently, only

30 items were kept from the original 40-item tool and a new factor analysis was run. The results of this factor analysis can be seen in Table 6 and Figure 1. The items that were removed from the original version of SDLSS are: items 7, 8, 11, 12, 13, 16, 24, 28, 39, 40 (refer to Appendix A to see the original SDLSS).

Pattern Matrix (Table 6) is one of the most useful tables in exploratory factor analysis produced by SPSS. It shows the structure of a tool by grouping variable into different sub-scales. The small numbers below 0.3 were suppressed to see the pattern clearer. There were only four variables that had double loadings, the rest loaded to just one sub-scale each. It means that the removal of 10 items from the original scale affected the results of the factor analysis favorably. In the new factor analysis the number of sub-scales was limited to six, the rotation method was still oblique/oblimin. One variable that loaded to sub-scale one "I always assess the result of my work" was moved to sub-scale three named "Assessment of learning outcome or learning resources" as it suited that scale better.

Table 6. *Pattern Matrix[a] from Exploratory Factor Analysis*

	Component/Sub-scale/SDL skill					
	1	2	*3*	*4*	*5*	*6*
I believe in the importance of playing an active role in learning.	.622					
I try to be attentive when learning something new because it may help me easily learn new concepts in the future.	.600					
I hold myself responsible for success of my learning/personal development.	.530					
When I am faced with a difficult task, I look for ways to solve it.	.521				.359	
Before learning something new I must have a clear goal in mind.	.515					
When I start learning something new, I review the previous knowledge I may have on the new topic.	.514					
I always assess the result of my work*.	.489					

When I learn new information I try to establish a connection between the new pieces of information and the ones I learned before.	.487					
Generally, I find it hard to integrate (synthesize, summarize) information I obtained from different resources.		.692				
I cannot establish accurate hypotheses about events or problems.		.686				
When I am studying new material, I have difficulty connecting the information I have learned with daily life.		.673				
I have difficulty using different learning strategies (for example, underlining or highlighting important points/ideas, making notes, making flash cards) in the learning process.		.639				
I am reluctant to take on those tasks that I am not good at.		.593				
After each learning session I question myself whether I used materials adequately.			-.809			
During each learning process, I question myself regarding whether I have made use of the Internet and/or other learning resources for my purposes.			-.791			
After each learning process, I assess which of the learning resources I used was more efficient.			-.619			
If I set myself a goal to learn something, then at the end of the day I assess the outcome of my learning.			-.362			
I take notes about important points/ideas when studying new material.				.717		
I make use of different learning strategies depending on the properties of the material I am studying (for example, I underline or highlight important points/ideas, make notes, make flash cards).				.611		
When I need to find something out, I know where to find needed information.					.747	
I know how to find information on the Internet or in a library.	.312				.653	
I believe I am able to independently learn new material/concepts, no matter how complicated they may be.				.443	.545	
I can produce alternative solutions when solving problems.					.529	
I know that I can find solutions to any problem I may encounter.					.411	
I allocate most of my free time to personal development.						-.696

I want to devote my free time to studying or learning what I find interesting.						-.692
I am motivated to pursue personal development and nothing may distract me from this goal.						-.649
When I have free time I use Internet mostly for learning purposes (for example, for reading books, stories, articles, news, or for watching videos with useful tips and lessons).						-.536
I plan/manage my time when it comes to work, performing tasks, self-development or reading for pleasure.						-.526
I underline or jot down important ideas when reading books or studying other materials (for example, audio or video materials).				.384		-.409

Note. Developed by the author of the thesis in SPSS. Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 18 iterations.
* was moved to component/sub-scale 3

Scree plot (Figure 1) shows that first levelling off appears after three factors, however, there is a sharp reduction in explained variance continues up to factor 6. Afterwards, the variance becomes too small. Scree is a very subjective way of determining the number of sub-scales.

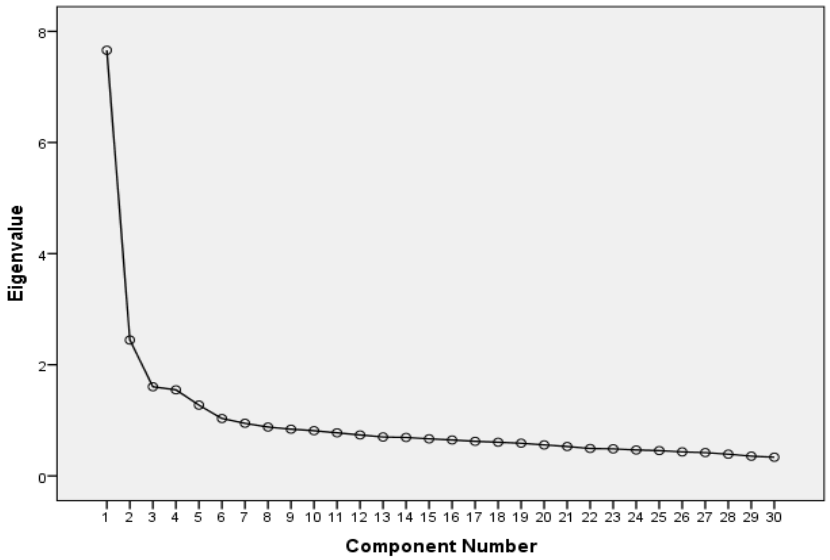

Figure 1. Scree plot of the exploratory factor analysis of the 30-item SDLSS

After the factor analysis, the Kaiser-Meyer-Olkin (KMO) coefficient was found to be .921 and the Bartlett test was found to be statistically significant ($\chi 2$ = 7356.809, *df* = 435, *p* = .000) (see Table 7). Both tests of sampling adequacy (George & Mallery, 2012). To be more specific, KMO measures whether any given distribution of values is adequate for conducting factor analysis. Measures higher than 0.9 are considered "marvelous", between 0.8-0.9 are "meritorious", between 0.7-0.8 are "middling", between 0.6-0.7 are "mediocre", between 0.5-0.6 are "miserable", and below 0.5 "unacceptable". The sample of this study is 661 educators and 205 high school students. The total number of participants is 866. The KMO measure of sampling adequacy is 0.921 or "marvelous". Moreover, the significance level of Bartlett's Test of Sphericity is .000, which is lower than 0.05, which means that this sample is acceptable for factor analysis.

Table 7. *KMO and Bartlett's Test Results for SDLSS*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.921
Bartlett's Test of Sphericity	Approx. Chi-Square	7356.809
	df	435
	Sig.	.000

Source: Developed by the author of the thesis

Using the new sub-scales created by the Pattern Matrix, six sub-scales were created. Their Chronbach's alphas were re-calculated. Each sub-scale was given a title that summarized all the variables in it. Below is the summary of internal consistency tests for each sub-scale.

Table 8. *Chronbach's Alphas of Six Sub-Scales*

Sub-scale	*Number of items*	*Chronbach's alpha*
Sub-scale/SDL skill 1: Learning responsibility	7	0.798

Sub-scale/SDL skill 2: Ability to manage information	5	0.690
Sub-scale/SDL skill 3: Assessment of learning outcome or learning resources	5	0.741
Sub-scale/SDL skill 4: Application of learning strategies	3	0.564
Sub-scale/SDL skill 5: Ability to find information	5	0.708
Sub-scale/SDL skill 6: Motivation to allocate time for learning	5	0.726

Source: Developed by the author of the thesis

Sub-scale 2 had Chronbach's alpha of 0.69 and the sub-scale 4 was at 0.564 (Table 8 above). This is below acceptable minimum of 0.7 (Muijs, 2004). Nevertheless, these sub-scales were kept because they measure important parts of SDL skills. Sub-scale 2 measures ability to manage information, while sub-scale 4 measures the ability to apply learning strategies. For example, Candy, Crebert, and O'Leary (1994) asserted that a lifelong learner is someone who has an inquiring mind, information literacy (having strategies to locate, access, retrieve, evaluate, manage and make use of information in a variety of fields), and a repertoire of learning skills (such as knowing own strengths, weaknesses, and learning style) among other things. In their definition, a lifelong learner knows and applies learning strategies that help him/her manage and make use of information. Removing sub-scales 2 and 4 from the instrument would not yield a comprehensive SDL skills measuring tool. Therefore, they were kept despite the results of the internal consistency tests.

To sum up, as the result of the factor analysis and reliability tests for internal consistency, 40-item SDLSS tool (Appendix A) with 9 sub-scale was reduced to 30 items with six sub-scales (see Appendices B and C). Sub-scales contained 3 to 7 items in each. The following titles to the subscales were given: "learning responsibility", "ability to manage information", "assessment of

learning outcome or learning resources", "application of learning strategies", "ability to find information", and "motivation to allocate time for learning". Using the adapted SDLSS tool students' and educators' SDL skills levels were then calculated. If the initial tool had a maximum of 200 points (maximum 5 points for each of the 40 items), the adapted 30-item tool awarded 150 points maximum (maximum 5 points for each item). The highest score from an item is 5. The most positive opinion (Strongly Agree) gets 5 points. The most negative opinion (Strongly Disagree) gets 1 point. There are 5 negative items (6, 26, 27, 34, 36) in the scale. Their scoring is done in reverse. It means that 'Strongly Agree' gets 1 point, Strongly Disagree gets 5 points.

Data Analysis

Several statistical methods were implemented in this study. To answer the research question and to test the hypothesis, descriptive and inferential statistics (independent samples t-tests and calculation of Cohen's d) were generated using SPSS software. Descriptive analyses were conducted to provide information about respondents' SDL skills scores and to compare the results by respondent group, gender, age, and SDL skill. Any differences in scores were tested for their significance using t-tests, and any significant difference in scores was measured for its effect size using Cohen's d formula (Muijs, 2004).

Limitations

There was a number of limitations in this study. Firstly, the response rate from some schools was lower than expected. As a result, some schools were underrepresented, while others were overrepresented. Secondly, the sub-scale 4 *application of learning strategies* had only three items in it and it resulted in Chronbach's alpha of 0.564, which is below the accepted minimum

of 0.7 (Muijs, 2004). Therefore, the reliability of the tool may be questioned to some degree. Lastly, the SDLSS is missing an important SDL sub-construct connected to goal-setting skill. Setting a goal is one of the main skills self-directed learners must possess (Rogers, as cited in Jahns, 1971; Knowles, 1975; Guiter, 2014; Bartholomew, 2017). There is only one item in 40 that is connected to goal-setting: "I must know clearly and implicitly the objectives of the new subject to be learnt". This statement does not represent a learner's self-directedness in learning because *knowing a goal* does not necessarily mean *knowing how to set a goal* or *having a habit of setting a goal.* In the schools participating in this study, teachers set goals for students. These objectives are written in the curriculum of their subjects. They are normally inflexible and cannot be changed. At the beginning of each lesson students listen to a teacher, who tells them what their lesson objectives are. So, the students learn what the educational program dictates. Therefore, a student studying in such a teacher-centered environment may answer "strongly agree" to the statement above and get the maximum number of points for it, yet still be incapable of setting his/her own learning goals. Hence, the results based on this data collection tool in this study shall be interpreted with caution. While this chapter has described the research design of the study, the sample, the research site, the data collection instrument, the way an SDL measuring tool was chosen and adapted, and the way dataset was adjusted after the survey was administered, the next chapter will present the findings of this primary research.

CHAPTER IV: FINDINGS

This chapter I will present the findings of this exploratory survey study. The purpose of this study was to determine high-school students' and educators' levels of SDL skills across participating schools. Therefore, the research question of this study was: "What is the level of self-directed learning skills among educators and senior-year high-school students in a network of schools for gifted and talented students in Kazakhstan?" It was hypothesized that the high-school students' level of SDL skills was lower than that of the educators'. To answer the research question and to test the hypothesis, the data was collected using an adapted SDLSS, a 30-item Likert scale questionnaire, and the descriptive and inferential statistics were generated using SPSS and analysed.

SDL Skills: the Case of High-school Students and Educators in Kazakhstani schools for Talented and Gifted Pupils

Data analysis showed that the mean values for students and teachers are not that different from one another (see Tables 9 and 10). Students' mean SDL skills score is 112.94 (*SD* = 12.15) out of 150 points (30 questions, 5 point maximum for each), while educators' mean score is 117.23 (*SD* = 11.5). Students' mean amounts to 75% of the total score, while educators' to 78%.

Table 9. *Average SDL Scores of Students*

N	Valid	205
	Missing	0
Mean		112.94
Median		114.00
Mode		109
Std. Deviation		12.153

Source: Developed by the author of the thesis

Table 10. *Average SDL Scores of Educators*

N	Valid	661
	Missing	0
Mean		117.23
Median		117.00
Mode		112
Std. Deviation		11.496

Source: Developed by the author of the thesis

To determine whether the difference between the two means is statistically significant a t-test was performe. The t-test for independent samples showed that there is a statistically significant difference between SDL levels of educators and high school students ($t(866) = -4.6$, $df = 864$, $p = .000$). Teachers have statistically significantly higher SDL skills level when compared to students.

To measure the effect size of the difference in means Cohen's d formula was used (Muijs, 2004). Cohen's d value amounted to -0.36, which signifies a modest effect in the difference of two means. Therefore, even though a statistically significant difference between the mean scores of SDL level of educators and students exist, its effect size is modest.

Furthermore, I generated the following table to compare respondents' scores for each SDL skill and ran independent samples t-tests to investigate whether the mean scores were significantly different from one another. The t-tests showed that all SDL skills except one (*ability to find information*) were significantly different from one another (see Table 11 below). The Table 11 shows that educators have higher learning responsibility, are better at assessing learning outcome or learning resources, applying learning strategies than high-school students and are more motivated to allocate time for learning. On the other hand, students are better at managing information than educators and both groups are equally adept at finding information. There is a moderate effect size for the difference in means for *assessment of learning outcome or learning resources* (-0.55) and modest effect sizes for the rest of the SDL skills (Cohen's d range from -0.43 to 0.25). The results of the t-test also showed that students and their educators are equally skilled at finding information as the significant difference for mean scores of both groups was not found.

Table 11. *Comparison of Students' and Educators' Mean Scores, Standard Deviations, Cohen's d for Each SDL Skill*

SDL skill	*Students or educators*	*N*	*Mean*	*Std. Deviation*	*T-tests*		*Cohen's d*
					t value	*p value*	
Learning responsibility	Students	205	29.35	4.015	-5.18	.000	-0.43
	Educators	661	30.96	3.48			
Ability to manage information	Students	205	14.08	3.783	3.18	.002	0.25
	Educators	661	13.13	3.728			
Assessment of learning outcome or learning resources	Students	205	17.46	3.809	-6.58	.000	-0.55
	Educators	661	19.4	3.214			
Application of learning strategies	Students	205	12.1	2.275	-3.36	.001	-0.26
	Educators	661	12.69	2.198			
Ability to find information	Students	205	20.58	2.71			
	Educators	661	20.68	2.793			
Motivation to allocate time for learning	Students	205	19.37	3.535	-3.66	.000	-0.30
	Educators	661	20.37	3.036			

Source: Developed by the author of the thesis

To see how each group of respondents performed on each SDL skill, the following table was populated using SPSS. Table 12 includes the numbers of respondents, minimum and maximum number of points received when answering questions, mean values, percentages and standard deviations on SDL skills level:

Table 12. *Extent to Which Each SDL is Mastered by Students or Educators*

	SDL skill	*N*	*Total number of points*	*Mean*	*Std. Deviation*	*% of total score*
Students	Learning responsibility	205	35	4.015	4.015	84%
	Ability to manage information	205	25	3.783	3.783	**56%**
	Assessment of learning outcome or learning resources	205	25	3.809	3.809	**70%**
	Application of learning strategies	205	15	2.275	2.275	81%
	Ability to find information	205	25	2.710	2.710	82%

	Motivation to allocate time for learning	205	25	3.535	3.535	77%
	Valid N (listwise)	205				
Educators	Learning responsibility	661	35	3.480	3.480	88%
	Ability to manage information	661	25	3.728	3.728	**53%**
	Assessment of learning outcome or learning resources	661	25	3.214	3.214	78%
	Application of learning strategies	661	15	2.198	2.198	85%
	Ability to find information	661	25	2.793	2.793	83%
	Motivation to allocate time for learning	661	25	3.036	3.036	81%
	Valid N (listwise)	661				

Source: Developed by the author of the thesis

High-school students scored the lowest on *ability to manage information* (56% of the total score) and on *assessment of learning outcome or learning resources* (70% of the total score). At the same time, the educators scored even lower on the ability to manage information (53% of the total score). Both students and educators scored highest on *learning responsibility* (84% and 88% of the total score, respectively).

Effect of Gender on SDL Skills

The next descriptive statistics compares SDL skills by gender (see Table 13). Based on the independent samples t-tests, only the means of *learning responsibility*, *assessment of learning outcome or learning resources*, and *application of learning strategies* were significantly different from one another. On all three SDL skills males scored a bit less than females, which may mean that females have an edge at self-directed learning skills. The next table compares SDL skills scores by gender and includes such information as means, standard deviations, t values, and p values.

Table 13. *Comparison of SDL Skills by Gender (results of students and educators are combined)*

					T-tests	
	Gender	*N*	*Mean*	*Std. Deviation*	*t value*	*p value*

SDL skill							*Cohen's d*
Learning responsibility	Male	248	**29.89**	3.937	-3.71	.000	-0.27
	Female	605	**30.91**	3.493			
Ability to manage information	Male	248	13.71	3.950			
	Female	605	13.18	3.687			
Assessment of learning outcome or learning resources	Male	248	**18.33**	3.745	-3.26	.001	-0.25
	Female	605	**19.22**	3.311			
Application of learning strategies	Male	248	**11.73**	2.446	-6.65	0.000	-0.52
	Female	605	**12.90**	2.051			
Ability to find information	Male	248	20.83	2.865			
	Female	605	20.60	2.747			
Motivation to allocate time for learning	Male	248	19.87	3.309			
	Female	605	20.25	3.131			

Source: Developed by the author of the thesis

The effect sizes of significant differences were calculated using Cohen's d formula (Muijs, 2004) and were presented in the last column of the table above. For *learning responsibility* and *assessment of learning outcome or learning resources* we see modest effect sizes (-0.27 and -0.25 respectively), while for *application of learning strategies* we can see moderate effect size (-0.52). This means that female learners apply learning strategies when engaged in self education.

Effect of Age on Educators's SDL Skills

As we learned there was a significant difference of the results (modest effect) between the groups of students and educators. However, once we look deeper into the educators group and divide them by age, the mean values for different age groups of educators did not vary greatly. Even though the 58-67 age group showed the highest mean value, a t-test comparing the first and

the last age group indicated the lack of significant difference (t(866) = -.39, df = 120, p = .7).

The following table shows how mean scores of educators change from one age group to another:

Table 14. *Educators' Means Scores of SDL Skills Grouped by Age*

Age of educators	*N*	*Mean*	*Std. Deviation*
18-27	94	117.95	15.771
28-37	252	116.77	10.771
38-47	157	117.17	10.786
48-57	130	117.27	10.678
58-67	28	119.14	8.423

Source: Developed by the author of the thesis

CHAPTER V: DISCUSSION

In the previous chapter, I provided the results of my exploratory survey study. The purpose of this study was to determine high-school students' and teachers' levels of SDL skills in schools for talented and gifted children. There was one research question: "What is the level of self-directed learning skills among educators and senior-year high-school students in a network of schools for gifted and talented students in Kazakhstan?" Moreover, based on the literature review, it was hypothesized that the level of SDL skills of the high-school students would be lower than that of the educators'. In this chapter I will discuss the results of this study and compare it to the existing literature on SDL.

SDL in Kazakhstani Schools for Talented and Gifted Pupils

The aim of this exploratory study was to determine the levels of high-school students' and teachers' SDL skills in schools for talented and gifted children. The research question and hypothesis arose from this goal. The research question of this study is: "What is the level of self-directed learning skills among educators and senior-year high-school students in a network of schools for gifted and talented students in Kazakhstan?" The hypothesis of this study is: the high-school students' level of SDL skills is lower than that of the educators'. In this section I will reiterate the findings answering the research question and try to find an explanation in the body of literature on SDL.

The results of this survey study showed that students' mean SDL skills score was 112.94 points (75%) out of 150 points, while teachers' mean score was equal to 117.23 (78%). While

the difference in means scores of pupils and teachers was found to be significant, the effect size was modest. These results support the research hypothesis.

Even though, these findings cannot be extrapolated to the larger population of all adolescents and adults of Kazakhstan due to limitations of the chosen sample, these findings are consistent with those of Knowles (1975), Tough (1971) and Carson (2012). Knowles (1975) suggested that as a person matured he became more self-directed or autonomous in his learning. Tough (1971) found that 16-year-olds were as self-directed as working adults, and even had more learning projects than adults, however, their independent learning inquiries were shorter in time than the adults'. For example, on average, an adult spends 100 hours on a learning project, while a 16-year old only spends 70 hours. There were no other studies found among the literature that compared the SDL results of students and teachers, or adolescents and adults.

Another finding of this study pointed out to how well each SDL skill was mastered by high-school students and educators. A finding that stood out is that both educators and students of high-schools for talented and gifted children reported themselves as being very responsible when it concerned learning (scored 88% and 84% respectively), and both reported having a lower ability to manage information (53% and 56% respectively). It was noted that students showed a slightly better result than educators did. The *ability to manage information* included, among others, the ability to establish accurate hypotheses about events or problems, to integrate (synthesize, summarize) information obtained from different resources, and to connect newly learned material to daily life. Applying learned knowledge in a real-life context has been a challenge for Kazakhstani school students. *Reviews of National Policies for Education: Secondary Education in Kazakhstan* prepared by OECD (2014), pointed to the results of

Kazakhstani students, who participated in a Trends in International Mathematics and Science Study (TIMSS) in 2011. TIMSS is an international assessment "designed to inform educational policy and practice by providing an international perspective on teaching and learning in mathematics and science" (ACER, n.d., para. 1). Back in 2011 the Kazakhstani students who completed the study showed good results at *knowing information*, but lower results related to *applying knowledge* or *reasoning*. The results of the current survey study proves that much work still needs to be done on both adults and adolescents to help them learn how to apply information in real-life contexts and how to improve their SDL skill of *managing information* in general.

Finally, the last finding of this research was that both high-school students and educators scored equally well on the *ability to find information*. This can be explained by the fact that these high-school students study in a technologically rich environment where they have easy access to computers and the Internet. These days younger generations know how to use information technologies, and in particular, social networking websites or applications in order to find any information they are looking for.

Effect of Gender on SDL Skills

An unexpected finding of this study rests in the fact that the female respondents of the survey (students and educators combined) scored higher on some SDL skills in comparison to males. Females showed higher results on learning responsibility, assessment of learning outcome or learning resources, and application of learning strategies. The effect size was modest for *learning responsibility* and *assessment of learning outcome or learning resources*, and was

moderate for *application of learning strategies*. For the rest of the SDL skills there was no significant difference between the two gender groups. This finding is consistent with that of Van Duyne's (2017), who conducted a study among doctoral students and found that female students scored higher than their male counterparts. A recent study by Slater et.al (2017) that compared first-year undergraduate students, also found that SDL readiness was significantly higher in females than in males. However, these findings contrast the results of an earlier study of Tough's (1971), who observed that female working adults spent less time on learning projects than males. While male adults spent 1097 hours a year on learning projects, females dedicated only 385 hours for such educational projects. But there could be different explanations for that; Tough's study was conducted at the beginning of the 70s when gender roles were slightly different from what we see today. This was a time when most women were still housewives, whose roles were mainly to bring up their children. Those who were part of the labor force, typically held jobs that were considered less intellectual in nature than men's. Therefore, this could be a case of the context influencing women's self-directedness in learning: today, in countries that are now driven by the value of gender equality, women have the same access to education as men, they work as much as men do, and can be as driven to achieve their goals. Therefore, more recent studies reflect an environment were women and men have equal opportunities to develop their skills, and where women have become more self-directed in their learning.

Effect of Age and Maturity on SDL Skills

While the research hypothesis of this study rests on the premise that maturity is one of the main predictors of a person's SDL skills level, this premise will not hold if we are to assume that

maturity and age have a linear relationship and are interchangeable in determining one's SDL skills level. According to one of the findings of this study, all of the educators had relatively the same level of SDL skills regardless of what age group they belonged to. In other words, when educators were grouped by age and their mean scores were compared, the difference was found to be statistically insignificant. To some extent, this finding is in line with the finding of Ponton (2018), who compared the SDL readiness of doctoral and master's students. Ponton reported that there was no significant difference between the two groups. Even though Ponton's study compared groups of people according to their highest level of education, it can be assumed that for the most part, the doctoral students were older than the master's students, which could lead to the suggestion that age is not always a predictor of higher levels of SDL, or at least that age does not have a linear relationship with maturity level.

These outcomes, on the other hand, are contrary to those arrived at by Plews (2017) and Slater, Cusick and Louie (2017), who reported finding a difference in SDL readiness when they compared groups of adults of different ages. If we investigate these studies more deeply , we will see that Plews compared traditional and nontraditional undergraduate students, with traditional students (18-22 years of age) being ones who had just graduated from high school and had immediately entered a higher educational institution, and nontraditional students (25-55 years of age) being older individuals, who entered universities several years following high-school graduation, and who had a wider age range than that of traditional students. Another study conducted by Slater et. al (2017) compared first-year undergraduate students studying in different educational programs. He also reported a significant difference in SDL readiness when students were compared by age, and interestingly, he also found that the students in some

programs, such as occupational therapy and physiotherapy studies, were more self-directed than in others.

Contrary to the findings of Slater et. al (2017) and Plews (2017), which suggested that age played a difference in SDL preparedness, Sutherland and Crowther (2008) proposed that people do not necessarily mature at the age of 18, and do not necessarily take responsibility for their own actions. Instead, maturation may only become apparent when a young adult reaches his or her twenties. According to these researchers, the process of maturation starts at the period of youth and continues into a person's twenties and may never be completely achieved. Therefore, making the conclusion that age is a predicting factor of SDL readiness would not be recommended.

Since the findings connected to the correlation of age to SDL tends to be inconsistent, a better predictor of an individual's SDL preparedness could be his or her occupation, or in other words, the environment or context in which the individual functions. Candy (1991) and Hiemstra and Brockett (2012) suggested that a person's level of self-directedness differed depending on his or her environment. Hiemstra and Brockett (2012) defined context as an environment in which a learner operates, and which includes such components as the sociopolitical climate, culture, gender roles, organizational policies, and sexual orientation. This is in accordance with my earlier observations of research conducted by Tough (1971) and Slater et al. (2017). Tough (1971) reported that professors and politicians spent more time on self education than mothers of young children or elementary school teachers, while Slater et al. (2017) found that undergraduate students of occupational therapy and physiotherapy were more self-directed than students of

other programs. All of these findings suggest that occupation or the environment or context may be a better predictor of one's motivation to engage in self-directed learning.

CHAPTER VI: CONCLUSION

Whereas a hundred years ago, a person could learn one trade and work at the same job for many years, in today's world, one's knowledge and skills may become obsolete within a decade, therefore, the pursuit of lifelong learning has become a must. Many countries, including Kazakhstan, have placed lifelong learning at the core of their education policies (Bound, Lin, & Rushbrook, 2014; European Commission, Cedefop, & ICF International, 2014; Mok et.al, 2007; OECD, 2014; Watson, 2013).The Kazakhstani approach is focused on providing the instruction of basic skills through various forms of teaching (distance learning, short-term refresher courses, and formal, informal, and inclusive classes) (Ministry of Education and Science, 2010). However, this can only be insufficient as one of the chief prerequisites of lifelong learning is having a set of self-directed learning skills (Knowles, 1975). These are not basic skills. Rather, they are specific skills.

Self-directed learning skills are defined in this study as a set of abilities and characteristics that include taking responsibility for one's own learning, being motivated to learn and allocate time for such learning, being able to locate and manage information, assessing one's learning outcomes and/or learning resources, and applying learning strategies to one's own learning. Self-directed learning implies that a learner exercise control over all of his/her own educational decisions (Guiter, 2014), be it diagnosing one's own learning needs, setting a goal, choosing the appropriate learning resources, learning strategies, or the most ideal time for studying, and evaluating the results of such learning.

The literature on SDL is mainly concentrated on adult learners. Little attention is given to school pupils and their SDL skills. To counter this limited amount of research on school

students, the aim of this study was to measure the level of high-school pupils' self-directed learning skills and compare them to those of their educators.

It was theorized that maturation is the key predictor of one's self-directedness in learning (Knowles, 1975). In support of that theory, Tough (1971) found that while children of 10-years of age were not generally oriented towards pursuing self education unless told to, adolescents of 16-years of age depicted a high-level of self-direction in learning. He stated that teenagers engaged in as many or sometimes even more self-chosen learning projects than adults, however, each learning project was shorter in duration than those of adults. As the concept of SDL started evolving and expanding, some scholars proposed that learners could depict different levels of SDL depending on the environment/context in which they functioned (Candy, 1991; Hiemstra & Brockett, 2012). Such an environment or context can be represented as a place of work, a gender role, the culture, or the learner's sexual orientation. Indeed, it was found that people of certain occupations pursued more learning projects than others. For example, politicians and professors were the ones who pursued self education the most, while mothers with little children were on the other side of this SDL spectrum (Tough, 1971).

Based on the aim of this study, the following research question guided this study: "What is the level of self-directed learning skills among educators and senior-year high-school students in a network of schools for gifted and talented students in Kazakhstan?" On the other hand, based on the literature on SDL, the following hypothesis was formed: *the high-school students' level of SDL skills is lower than that of the educators'*. To test the hypothesis, the Self-Directed Learning Skills Scale (Ayyildiz &Tarhan, 2015) was adapted to the Kazakhstani context and tested across twenty-one schools for talented and gifted children.

Summary of Findings

To conduct this exploratory survey study, 661 educators and 205 high-school students from twenty-one schools for talented and gifted children were recruited. The results showed that the students' mean level of SDL skills equaled 112.94 out of 150 points (75%), while that of the educators' totaled 117.23 (78%). The effect size of this difference, calculated using Cohen's d formula, was found to be modest. These results support the research hypothesis that *the high-school students' level of SDL skills is lower than that of the educators.*

Studies on SDL have produced conflicting results with regard to age being one of the predicting factors. While this study found a significant difference in SDL skills between students and educators, however, the difference was not found when educators of different ages were compared to one another. It can, thus, be implied that although maturity can be one of the factors, age does not necessarily represent maturity, and, therefore, cannot be regarded as a determinant of the growth of SDL skills. On the other hand, the environment/context or one's occupation yielded different results in SDL. Professors and politicians spend more time on self-directed learning than mothers with small children or elementary school teachers (Tough, 1971). To add to that, first-year undergraduate students of occupational therapy and physiotherapy studies scored higher on SDL readiness than students in other educational programs (Slater et.al, 2017). These findings imply that the context/environment one functions in is a good determinant of one's development of self-directedness and concur with the conclusions of Candy (1991) and Hiemstra and Brockett (2012).

When comparing female and male learners to each other, it was found that female learners showed better results in three out of six SDL skills: *learning responsibility*, *assessment*

of learning outcome or learning resources, and *application of learning strategies.* This finding was consistent with those of Van Duyne (2017) and Slater et.al (2017), but contradicted Tough's (1971).

While both educators and high-school students scored high on *learning responsibility*, both groups scored low on the *ability to manage information*. The *ability to manage information* included such skills as the ability to establish accurate hypotheses about events or problems, to integrate (synthesize, summarize) information obtained from different resources, and to connect newly learned material to daily life in a practical way. While applying knowledge to the real-life context has been a real challenge for Kazakhstani school students (OECD, 2014), the results show that educators struggle with this, too.

By understanding where Kazakhstani students and teachers stand in terms of their ability to pursue lifelong education through self-directed learning, educational leaders may be more able to prepare better education and training programs for the development of these 21st century skills. This study has made a modest contribution to the body of SDL research in understanding how well high-school students and educators are prepared for lifelong learning and what skills they struggle with the most, but more research needs to be done in this regard.

Recommendations

Most of the recommendations in this chapter are directed at education leaders. Educators must raise the awareness among students and teachers that to be a successful lifelong learner, one must possess self-directed learning skills (Knowles, 1975). Educators should diagnose students' level of SDL skills annually, to see what interventions should be made to further promote these.

Education leaders should also pay attention to teacher training programs as teachers are the ones who are in a position to then help students acquire the skills that promote their own self-directed learning. Attention should be focused on the weaker and less prevalent SDL skills such as the *ability to manage information,* as discussed in this research. Moreover, various SDL courses could be analyzed, compared, and implemented. For example, the research of Curry et al. (2017) demonstrated that it was possible to teach SDL skills to freshmen university students of 18-19 years of age through a one-semester SDL course. Even minor interventions consisting of showing a video about SDL strategies, involving students in a discussion, asking them reflect on SDL, and encouraging them to attribute learning success to autonomous learning behaviors, can be impactful on learners' academic achievement (Ginnings & Ponton, 2017). Lastly, it was found that technologically rich environments provide more opportunities to pursue self-directed learning (Bartholomew, 2017), therefore, schools must ensure that create that this kind of environment is available to their students.

Limitations and Further Research

There are several limitations in this study. Firstly, the research was limited to only one network of schools for talented and gifted children. As per the rule, these schools accept only academically successful pupils of various socioeconomic backgrounds. In order to enter one of these schools, students are required to sit an entrance exam. The pupils' results are then ranked and those with the highest results are accepted. The same applies to the educators who work at these schools. They, too, must pass tests and a round of interviews in order to be offered a teaching position there. Moreover, the teachers of the participating schools take part in professional training programs conducted by experts from all over the world, and this exposes them to the values, attitudes and teaching methods that are present in other countries. All of this

presents opportunities for these schools to create an educational culture and environment that differs from the ones in public schools. As students of these schools spend more than 40 hours a week at school, it is safe to assume that the culture of these schools is hugely impactful in their lives. Consequently, the findings of this study cannot be extrapolated to all other high-schools in Kazakhstan.This means that, although the sample sizes were adequate (661 educators and 205 high-school students), the inclusion of mainstream, rural and private schools would have guaranteed a more accurate representation of SDL skills among students and educators in the high-schools of Kazakhstan.

Several respondents complained that the survey took too much time to complete (40 items takes 15 minutes on average). This may be the reason why more than 200 hundred people did not complete it till the end. Therefore, it would be necessary to shorten the survey or utilize a more appropriate tool to avoid discouraging potential participants in the future.

Moreover, since it was found that "acquiring new skills is significantly more effective until early adolescence than later in life" (Janacsek, Fiser, & Nemeth, 2012, p. 496), it is important to conduct experimental SDL studies among school students in order to pinpoint the most crucial time for secondary school pupils to develop self-directed learning skills. As a starting point, Tough's (1971) interview questions could be used to find out how many learning projects school students engage in on average on a yearly basis and how much time they spend on them. At the same time, SDL courses can be introduced and evaluated in research studies.

More studies should be done among adult learners, comparing learners indifferent occupational fields. It would also be worth comparing such results according to marital status or the presence of children in a family.

Although school is an important place for a child to develop and grow, parents play an equally important, if not more important, part in a child's development. Therefore, more studies should be done to understand how parents affect the development of their children's SDL skills. The SDL skills of both parents and children can be compared to each other, and the correlation between these results can be explored. Having only one parent or no parents at all should be taken into consideration as well when collecting and analyzing such data.

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APPENDIX A: Self-Directed Learning Skills Scale (SDLSS) developed by Ayyildiz and Tarhan (2015)

Please mark how much you agree or disagree with the statement in the sentence:

Strongly Agree
Agree
Partially Agree
Disagree
Strongly Disagree

1. I take notes about important points when learning a new subject
2. I believe that I can learn a lesson, no matter how it is complicated
3. I should use the internet for learning purposes, instead of having a good time
4. I make use of different learning strategies depending on the properties of the subject I am going to learn
5. I can solve the problems I encounter during learning based on cause and effect relationship
6. I have difficulty relating the information I have learned in the lessons to the daily life
7. My friends say that I suggest interesting new ideas while discussing the learning process
8. The result of an examination is not an indicator of my learning achievement
9. I organise my study hours by making plans
10. I underline the important parts while reading a text
11. I am aware that the knowledge that I obtain when I study immediately before the examination is not permanent
12. If I can relate the new concepts to old knowledge, the learning is successful
13. I question the information in the books I make use of
14. If I am motivated for learning, any distracting factors do not sidetrack me from my objective
15. I pay attention to establish relations between concepts when I learn a subject
16. After each learning process, I think about what I should do to be more successful
17. During each learning process, I question myself regarding whether I have made use of the internet for my purposes
18. I hold myself responsible for my learning
19. I would like my hobbies during my leisure time to be didactic
20. I must know clearly and implicitly the objectives of the new subject to be learnt
21. After each lesson I question whether I used the course materials adequately and systematically

22. I always assess my achievements in the exercises/homework I completed
23. To learn a new subject without difficulty, I should learn related previous subjects well
24. Generally, I try to finish my homework at the last moment
25. When I want to learn a new subject, I know which learning resource I should use
26. I begin to worry that I could not solve the problems that I encounter
27. I cannot establish accurate hypotheses about the event or problems in the subjects that I have learnt
28. I believe that active participation in the learning process ensures the permanency of my knowledge
29. After each learning process, I assess whether I achieved the objective and outcomes I identified at the beginning
30. Instead of feeling despair when I encounter a difficult subject, I think about what I should do
31. While planning a new day, I prioritise time for learning
32. I review the previous knowledge that forms the basis for the new subject when I start to learn something new
33. I can produce alternative methods to reach solutions when I solve a problem
34. I have difficulty using different learning strategies in the learning process
35. After each learning process, I assess which of the learning resources I used was more efficient
36. Generally, I have difficulty in integrating information I obtained from different resources
37. I believe in the importance of playing an active role in learning
38. I have difficulty accessing the information I seek in an equipped library
39. The important thing is not what I learn, but whether I've got a passing grade
40. I motivate myself by thinking about the outcome I will obtain at the end of a learning process

The highest score from an item is 5. The most positive opinion (Strongly Agree) gets 5 points. The most negative opinion (Strongly Disagree) gets 1 point. There are 8 negative items (6, 24, 26, 27, 34, 36, 38, 39) in the scale. Their scoring is done in reverse. It means that 'Strongly Agree' gets 1 point, Strongly Disagree gets 5 points. Maximum number of points 200.

APPENDIX B: Adapted 30-item Self-Directed Learning Skills Scale for Pupils in English, Kazakh, and Russian

in English	*In Russian*	*In Kazakh*
Please indicate how much you agree or disagree with the following statements: • strongly disagree • disagree • neutral • agree • strongly agree	Укажите насколько вы согласны или не согласны со следующими утверждениями: • полностью не согласен • скорее не согласен, чем согласен • затрудняюсь ответить • скорее согласен, чем нет • полностью согласен	Төменде келтірілген мәлімдемелермен қаншалықты келісетініңізді немесе келіспегеніңізді көрсетіңіз: • мүлдем келіспеймін • келіспеймін • жауап беруге қиналамын • келісемін • толықтай келісемін
1. I take notes about important points when learning a new lesson topic.	1. Я делаю заметки о самом важном при изучении новой темы урока.	1. Жаңа тақырыпты меңгеру барысында маңызды деп тапқан дүниелерді белгілеп, жазып аламын.
2. I believe that I can independently learn a new lesson topic, no matter how complicated it can be.	2. Я считаю, что смогу самостоятельно изучить новую тему урока, какой бы сложной она не оказалась.	2. Жаңа тақырып қаншалықты қиын болса да, мен оны өз бетіммен меңгере аламын деп есептеймін.
3. When I have free time I use Internet mostly for learning purposes (for example, for reading books, stories, articles, news, or for watching videos with useful tips and lessons).	3. Когда у меня есть свободное время, я пользуюсь Интернетом в основном для саморазвития (например, смотрю видео с полезными советами, уроками, или читаю новости, истории, книги).	3. Бос уақытымда ғаламтор желісін негізінен өзімді дамыту үшін қолданамын (мысалы, пайдалы кеңестер айтылған бейнероликтер көремін, жаңалықтар, әңгімелер, тарихи немесе басқа да кітаптар оқимын).
4. I make use of different learning strategies depending on the properties of the subject I am going to learn (for example, I underline or highlight important ideas, jot down notes, create flashcards, or work in a group).	4. Я использую различные стратегии обучения в зависимости от школьного предмета, который я изучаю (например, подчеркиваю или выделяю важные идеи, делаю пометки, создаю флэш карточки, делаю записи, работаю в группе над сложными темами).	4. Мен мектепте оқып жатқан пәнге байланысты түрлі оқу стратегияларын қолданамын (мысалы, маңызды идеяларды баса көрсетіп, ерекшелеп, бөліп жазамын, өзіме белгілеп аламын, флеш-карталар жасаймын, жазбалар жасаймын, күрделі тақырыптар болса топта жұмыс істеймін).
5. I know that I can find a solution to any problem that may arise.	5. Я знаю, что смогу найти решение, если у меня возникнет какая-либо проблема.	5. Егер менде қандай да бір мәселе туындаса, шешімін таба алатындығымды білемін.
6. When I am studying new material (if I am learning something by myself or when preparing for school), I have difficulty connecting the information I have learned with daily life.	6. При изучении нового материала (при самостоятельном или школьном обучении), мне трудно связать новую информацию с повседневной жизнью.	6. Жаңа материалды меңгеру барысында (өз бетімен немесе мектепте оқыған кезде болсын) мен үшін жаңа ақпаратты күнделікті өмірмен байланыстыру қиынға соғады.

9. I plan my time when it concerns school, homework, housework, self-development or reading books for pleasure.	9. Я планирую свое время, когда дело касается учебы, выполнения домашних заданий, дел по дому, саморазвития или чтения книг для себя	9. Сабақ оқу барысында, үй тапсырмасын орындауда, үй шаруасымен айналысқанда, өзімді дамыту мақсатында кітаптар оқығанда мен өз уақытымды жоспарлаймын.
10. I highlight or write down important ideas while reading text or studying other types of materials (for example, audio or video materials).	10. Я выделяю или записываю важные идеи при чтении книг или изучении других материалов (например аудио или видео-материалов).	10. Кітап оқығанда немесе басқа материалдарды (мысалы, аудио немесе бейнематериалдар) меңгеру барысында маңызды идеяларды ерекшелеп бөліп аламын немесе жазып аламын.
14. I am motivated to pursue personal development and nothing may distract me from this goal.	14. Я мотивирован саморазвиваться и ничто не может отвести моего внимания от этой цели.	14. Мен өзімді дамытуға баса назар аударамын және осы мақсаттан ауытқымаймын, оған ешнәрсе кедергі емес
15. When I am learning a new lesson topic I try to establish a connection between the new topic and the ones I learned before.	15. При изучении новой темы урока, я стараюсь установить связь между новой и ранее изученными темами.	15. Жаңа тақырыпты меңгеру барысында бұрынғы өтілген тақырыппен өзара байланыстыруға тырысамын
17. During each lesson, I question myself whether I have made use of the Internet and/or other resources for my purposes.	17. Во время каждого урока я спрашиваю себя, использовал ли я Интернет и/или другие ресурсы для своих целей.	Әр сабақта мен Интернет жүйесі мен/немесе басқа білім беру ресурстарын өз мақсаттарым үшін қаншалықты пайдаланғандығымды сұраймын.
18. I hold myself responsible for success of my learning/personal development.	18. Только от меня зависит успех моего самообразования/образования.	18. Менің оқудағы, өзімді жетілдірудегі жетістіктерім тек маған ғана байланысты.
19. I want to devote my free time to studying or learning what I find interesting.	19. Свое свободное время я хочу посвящать изучению или обучению того, что мне интересно.	19. Бос уақытымды өзіме қызық дүниелерді оқуға, үйренуге жұмсағым келеді.
20. Before learning something new I must have a clear goal in mind.	20. Прежде чем изучить что-то новое, передо мной должна стоять четкая цель.	20. Бір нәрсені үйренбес бұрын, менде нақты мақсат болу керек.
21. After each lesson I question whether I used the lesson materials adequately.	21. После каждого урока я спрашиваю себя, в полной мере ли я использовал материалы.	21. Әрбір сабақтан кейін мен материалдарды толығымен қолданғаным туралы сұраймын.
22. I always assess the result of the exercises/homework I completed.	22. Я всегда оцениваю результат, выполненного мной задания.	22. Мен әрқашан өзім орындаған тапсырманың нәтижесін бағалаймын.
23. I try to be attentive during a lesson because it may help me easily understand upcoming lesson topics.	23. Я стараюсь быть внимательным на уроке, так как это может помочь мне освоить и будущие темы урока.	23. Мен сабақта барынша мұқият болуға тырысамын, себебі бұл алда өтілетін тақырыптарды да меңгеруге көмектеседі.

25. When I need to find something out, I know where to find needed information.	25. Когда мне нужно узнать что-то, я знаю, как и где найти нужную информацию.	25. Бір нәрсені білу керек болғанда, мен қажетті ақпаратты қалай және қайдан іздеу керек екендігін білемін.
26. I am reluctant to take on those tasks that I am not good at.	26. Я с неохотой берусь за те задачи, которые у меня плохо получаются.	26. Мен онша жасай алмайтын тапсырмаларды бар ниетіммен жасамаймын, амал жоқтықтан жасаймын.
27. I cannot establish accurate hypotheses about events or problems.	27. Я не могу установить точные гипотезы о событиях или проблемах.	27. Мен оқиғалар мен проблемалар туралы нақты болжамдарды орната алмаймын.
29. If I set myself a goal to learn something, then at the end of the day or the end of the lesson I assess the outcome of my learning.	29. Если я ставлю себе цель что-то изучить, то по окончании дня или по окончании урока я самостоятельно оцениваю результат своего обучения.	29. Мен бір нәрсені зерттеу немесе меңгеруге алдыма мақсат қойсам, күннің немесе сабақтың соңында өз нәтижеме баға беремін.
30. When I am faced with a difficult lesson topic I look for a way to understand it.	30. Когда я сталкиваюсь с трудной темой урока, я ищу способ понять её.	30. Тақырыпты түсіну мен үшін күрделі болса, оны түсінудің әдістерін, жолдарын іздеймін.
31. I allocate most of my free time to personal development.	31. Я уделяю большую часть своего свободного времени саморазвитию.	31. Мен өзімнің бос уақытымның көп бөлігін өзімді дамытуға арнаймын.
32. When I start learning a new lesson topic, I review the previous knowledge I may have on the topic.	32. При изучении новой темы урока, я мысленно обращаюсь к уже имеющимся знаниям.	32. Жаңа тақырыпты, материалды меңгеру барысында ойша бұрынғы білімдеріме сүйенемін.
33. I can produce alternative solutions when working on tasks.	33. Я могу придумывать альтернативные методы для решения задач.	33. Есептерді шығарғанда ерекше әдістерді қолдана аламын.
34. I have difficulty using different learning strategies during a lesson or when preparing for my lessons (for example, underlining or highlighting important points/ideas, making notes, making flash cards).	34. Мне трудно использовать разные стратегии обучения во время урока или при подготовке к урокам (например, подчеркивать или выделять важные идеи, делать пометки, создавать флэш карточки, делать записи).	34. Есептерді шығарғанда ерекше әдістерді қолдана аламын (мысалы, маңызды идеяларды баса көрсету немесе айқындау, ескертпелер жасау, флэш-карталарды жасау, жазбаларды жасау).
35. After each lesson, I assess which of the learning resources I used was more efficiently.	35. После каждого урока я оцениваю, какой из используемых мной учебных ресурсов был более эффективным.	35. Әр сабақ сайын, мен қай ресурстар өте тиімді болғанын бағалаймын.
36. Generally, I find it hard to integrate (synthesize, summarize) information I obtained from different school subjects or lessons.	36. Как правило, мне трудно интегрировать (синтезировать, обобщать) информацию, полученную из разных	36. Әдетте, мен үшін түрлі мектептегі пәндерден немесе сабақтардан алынған ақпаратты біріктіру (талдау, жалпылау, қорыту) қиындық тудырады.

	школьных предметов или уроков.	
37. I believe in the importance of playing an active role in learning during lessons.	37. Я верю, что принимать активное участие на уроках очень важно.	37. Сабаққа белсенді қатысу өте маңызды деп есептеймін.
38. I know how to find information on the Internet or in a library.	38. Я знаю как найти нужную мне информацию в Интернете или в библиотеке.	38. Мен өзіме керекті ақпаратты ғаламтор желісінен немесе кітапханадан қалай табу керек екендігін білемін.

The highest score from an item is 5. The most positive opinion (Strongly Agree) gets 5 points. The most negative opinion (Strongly Disagree) gets 1 point. There are 5 negative items (6, 26, 27, 34, 36) in the scale. Their scoring is done in reverse. It means that ‘Strongly Agree’ gets 1 point, Strongly Disagree gets 5 points. Maximum number of points 150.

APPENDIX C: Adapted 30-item Self-Directed Learning Skills Scale for Educators in English, Kazakh, and Russian

in English	*In Russian*	*In Kazakh*
Please indicate how much you agree or disagree with the following statements: • strongly disagree • disagree • neutral • agree strongly agree	Укажите насколько вы согласны или не согласны со следующими утверждениями: • полностью не согласен • скорее не согласен, чем согласен • затрудняюсь ответить • скорее согласен, чем нет полностью согласен	Төменде келтірілген мәлімдемелермен қаншалықты келісетініңізді немесе келіспегеніңізді көрсетіңіз: • мүлдем келіспеймін • келіспеймін • жауап беруге қиналамын • келісемін толықтай келісемін
1. I take notes about important points/ideas when studying new material.	1. Я делаю заметки о самом важном при изучении нового материала.	1. Жаңа материалды меңгеру барысында маңызды деп тапқан дүниелерді белгілеп, жазып аламын.
2. I believe I am able to independently learn new material/concepts, no matter how complicated they may be.	2. Я считаю, что смогу самостоятельно изучить новые понятия/концепции, какими бы сложными они не оказались.	2. Жаңа түсініктер, концепциялар қаншалықты қиын болса да, мен оны өз бетіммен меңгере аламын деп есептеймін.
3. When I have free time I use Internet mostly for learning purposes (for example, for reading books, stories, articles, news, or for watching videos with useful tips and lessons).	3. Когда у меня есть свободное время, я пользуюсь Интернетом в основном для саморазвития (например, смотрю видео с полезными советами, уроками, или читаю новости, истории, книги).	3. Бос уақытымда ғаламтор желісін негізінен өзімді дамыту үшін қолданамын (мысалы, пайдалы кеңестер айтылған бейнероликтер көремін, жаңалықтар, әңгімелер, тарихи немесе басқа да кітаптар оқимын).
4. I make use of different learning strategies depending on the properties of the material I am studying (for example, I underline or highlight important points/ideas, make notes, make flash cards).	4. Я использую различные стратегии обучения в зависимости от материала, который я изучаю (например, подчеркиваю или выделяю важные идеи, делаю пометки, создаю флэш карточки, делаю записи).	4. Мен оқып жатқан материалға байланысты түрлі оқу стратегияларын қолданамын (мысалы, маңызды идеяларды баса көрсетіп, ерекшелеп, бөліп жазамын, өзіме белгілеп аламын, флеш-карталар жасаймын, жазбалар жасаймын).
5. I know that I can find solutions to any problem I may encounter.	5. Я знаю, что смогу найти решение, если у меня возникнет какая-либо проблема.	5. Егер менде қандай да бір мәселе туындаса, шешімін таба алатындығымды білемін.
6. When I am studying new material, I have difficulty connecting the information I have learned with daily life.	6. При изучении нового материала, мне трудно связать новые понятия/концепции с повседневной жизнью.	6. Жаңа материалды меңгеру барысында мен үшін жаңа ақпаратты, түсініктерді күнделікті өмірмен байланыстыру қиынға соғады.

9. I plan/manage my time when it comes to work, performing tasks, self-development or reading for pleasure.	9. Я планирую свое время, когда дело касается работы, выполнения каких-либо задач, саморазвития или чтения книг для себя.	9. Мен жұмысқа қатысты қандай да бір тапсырмаларды орындау барысында, өзімді дамыту мақсатында кітаптар оқығанда өз уақытымды жоспарлаймын.
10. I underline or jot down important ideas when reading books or studying other materials (for example, audio or video materials).	10. Я выделяю или записываю важные идеи при чтении книг или изучении других материалов (например аудио или видео-материалов).	10. Кітап оқығанда немесе басқа материалдарды (мысалы, аудио немесе бейнематериалдар) меңгеру барысында маңызды идеяларды ерекшелеп бөліп аламын немесе жазып аламын.
14. I am motivated to pursue personal development and nothing may distract me from this goal.	14. Я мотивирован саморазвиваться и ничто не может отвести моего внимания от этой цели.	14. Мен өзімді дамытуға баса назар аударамын және осы мақсаттан ауытқымаймын, оған ешнәрсе кедергі емес.
15. When I learn new information I try to establish a connection between the new pieces of information and the ones I learned before.	15. При изучении нового материала, я стараюсь установить связь между новой и ранее изученной информацией.	15. Жаңа ақпаратты меңгеру барысында бұрынғы ақпараттармен өзара байланыстыруға тырысамын.
17. During each learning process, I question myself regarding whether I have made use of the Internet and/or other learning resources for my purposes.	17. Во время каждого учебного процесса я спрашиваю себя, использовал ли я Интернет и/или другие учебные ресурсы для своих целей.	17. Әр оқу үрдісінде мен Интернет жүйесі мен/немесе басқа білім беру ресурстарын өз мақсаттарым үшін қаншалықты пайдаланғандығымды сұраймын.
18. I hold myself responsible for success of my learning/personal development.	18. Только от меня зависит успех моего самообразования/образования.	18. Менің оқудағы, өзімді жетілдірудегі жетістіктерім тек маған ғана байланысты.
19. I want to devote my free time to studying or learning what I find interesting.	19. Свое свободное время я люблю посвящать изучению или обучению того, что мне интересно.	19. Бос уақытымды өзіме қызық дүниелерді оқуға, үйренуге жұмсағым келеді.
20. Before learning something new I must have a clear goal in mind.	20. Прежде чем изучить что-то новое, передо мной должна стоять четкая цель.	20. Бір нәрсені үйренбес бұрын, менде нақты мақсат болу керек.
21. After each learning session I question myself whether I used materials adequately.	21. После каждого учебного процесса я спрашиваю себя, в полной мере ли я использовал материалы.	21. Әрбір оқу үрдісінен кейін мен материалдарды толығымен қолданғаным туралы сұраймын.
22. I always assess the result of my work.	22. Я всегда оцениваю результат, проделанной мной работы.	22. Мен әрқашан өзім орындаған тапсырманың нәтижесін бағалаймын.

23. I try to be attentive when learning something new because it may help me easily learn new concepts in the future.	23. Я стараюсь быть внимательным, когда изучаю что-то новое, так как это может помочь мне освоить и новые понятия в будущем.	23. Мен қандай да бір ақпаратты меңгеру барысында барынша мұқият болуға тырысамын, себебі бұл болашақта да маған жаңа түсініктерді меңгеруге көмектеседі.
25. When I need to find something out, I know where to find needed information.	25. Когда мне нужно узнать что-то, я знаю, как и где найти нужную информацию.	25. Бір нәрсені білу керек болғанда, мен қажетті ақпаратты қалай және қайдан іздеу керек екендігін білемін.
26. I am reluctant to take on those tasks that I am not good at.	26. Я с неохотой берусь за те задачи, которые у меня плохо получаются.	26. Мен онша жасай алмайтын тапсырмаларды бар ниетіммен жасамаймын, амал жоқтықтан жасаймын.
27. I cannot establish accurate hypotheses about events or problems.	27. Я не могу установить точные гипотезы о событиях или проблемах.	27. Мен оқиғалар мен проблемалар туралы нақты болжамдарды орната алмаймын.
29. If I set myself a goal to learn something, then at the end of the day I assess the outcome of my learning.	29. Если я ставлю себе цель что-то изучить, то по окончании дня я оцениваю результат своего обучения.	29. Мен бір нәрсені зерттеу немесе меңгеруге алдыма мақсат қойсам, күннің соңында өз ісімнің нәтижесін бағалаймын.
30. When I am faced with a difficult task, I look for ways to solve it.	30. Когда я сталкиваюсь с трудной задачей, я ищу способ решить её.	30. Күрделі мәселеге тап болған кезде оны шешудің жолдарын іздеймін.
31. I allocate most of my free time to personal development.	31. Я уделяю большую часть своего свободного времени саморазвитию.	31. Мен бос уақытымның көп бөлігін өзімді дамытуға арнаймын.
32. When I start learning something new, I review the previous knowledge I may have on the new topic.	32. При изучении нового материала, я мысленно обращаюсь к уже имеющимся знаниям.	32. Жаңа ақпаратты меңгеру барысында ойша бұрынғы білімдеріме сүйенемін.
33. I can produce alternative solutions when solving problems.	33. Я могу придумывать альтернативные методы при решении проблем.	33. Мәселелерді шешудің баламалы әдістерін ұсына аламын.
34. I have difficulty using different learning strategies (for example, underlining or highlighting important points/ideas, making notes, making flash cards) in the learning process.	34. Мне трудно использовать разные стратегии обучения (например, подчеркивать или выделять важные идеи, делать пометки, создавать флэш карточки, делать записи) в процессе обучения.	34. Оқу үдерісінде әртүрлі оқыту әдістерін (мысалы, маңызды идеяларды баса көрсету немесе айқындау, ескертпелер жасау, флэш-карталарды жасау, жазбаларды жасау) қолдану маған қиынға соғады.

35. After each learning process, I assess which of the learning resources I used was more efficient.	35. После каждого процесса обучения я оцениваю, какой из используемых мной учебных ресурсов был более эффективным.	35. Әрбір оқу үрдісінен кейін мен қолданатын оқу ресурстарының қайсысы тиімдірек болғанын бағалаймын.
36. Generally, I find it hard to integrate (synthesize, summarize) information I obtained from different resources.	36. Как правило, мне трудно интегрировать (синтезировать, обобщать) информацию, полученную из разных ресурсов.	36. Әдетте, мен үшін түрлі ресурстардан алынған ақпаратты интеграциялау (талдау, жалпылау, қорыту) қиындық тудырады.
37. I believe in the importance of playing an active role in learning.	37. Я верю, что принимать активное участие в обучении очень важно.	37. Тренингке белсене қатысу өте маңызды деп есептеймін.
38. I know how to find information on the Internet or in a library.	38. Я знаю как найти нужную мне информацию в Интернете или в библиотеке.	38. Мен өзіме керекті ақпаратты ғаламтор желісінен немесе кітапханадан қалай табу керек екендігін білемін.

The highest score from an item is 5. The most positive opinion (Strongly Agree) gets 5 points. The most negative opinion (Strongly Disagree) gets 1 point. There are 5 negative items (6, 26, 27, 34, 36) in the scale. Their scoring is done in reverse. It means that ‘Strongly Agree’ gets 1 point, Strongly Disagree gets 5 points. Maximum number of points 150.