Supporting Multilingual Education with Computer Aided Instruction Applications

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Article Info	Abstract
	The purpose of this study is to examine the effect of computer-assisted instruction on the language achievement (Kazakh, English and Russian) and attitudes of university students who will work in general education schools in the future. In line with this purpose, pre-test post-test model with control group was applied in the study. The study group of the research consisted of 64 pre-service teacher university students studying at a university in Astana in the second year of the 2022-2023 academic year. There were 2 groups in the study, one experimental group (n=32) and the other control group (n=32). In the experimental group, computer-assisted instruction in a multimodal education environment and in the control group, traditional instruction was applied. Kazakh, Russian and English language achievement tests and attitude scale towards multilingual education were used to collect the research data. According to the findings of the study, it was found that the students who received computer-assisted instruction achieved higher Kazakh, Russian and English language proficiency compared to their peers who received traditional instruction. In addition, computer-assisted instruction positively affects students' attitudes towards multilingual education. The study sought to identify the risks and prospects for the development and expansion of trilingual education in the Republic of Kazakhstan. In this context, it was observed that the mother tongue outweighs the other languages learned.

Introduction

In the 21st century, which has turned into a race to raise the education levels of individuals, the level of education that all individuals who make up the society of a country have completed, such as university, high school, secondary school levels, is one of the basic elements that show the level of development of that country. In recent years, indigenous peoples have developed many educational approaches suitable for them (Blake, 2000). In countries where bilingual and multicultural programs or intercultural programs have been implemented for indigenous peoples, indigenous students have been much more successful in school than in the past and school attendance rates have increased significantly. Increased investment in education raises the quality of education to

higher levels and ensures individual development. For this reason, countries around the world pay attention to increase their investments in education every year and to improve the level of education (Clark & Kwinn, 2007; Şengül & Sünbül, 2015).

Improving the teaching environment allows students in classrooms to receive better education and to develop individually. Better education and individual development of each student in the classroom leads to the development of society in general. However, it is not enough to improve the teaching environments physically and equip them with materials alone. In this context, learning methods and techniques, technological tools, materials and teachers are among the factors that determine the quality of education. There are many factors affecting academic achievement in teaching environments (Cheng, Zhan & Chen, 2010; Softa, 2022; Supriyono et al., 2022). Learning methods and techniques, curricula, quality of teachers, technological tools and materials in classrooms are some of them. In addition, the correct selection and use of methods and techniques cause students to succeed or fail. Foreign language education has also been affected by the rapid developments in information and communication technologies (ICT) (Warner, 2004).

Computer Assisted Foreign Language Teaching in the Digital Age

In parallel with the developments in the technological field, many developments have occurred in the field of educational technologies. Foreign language teaching is one of the areas where educational technologies are frequently used. When compared to traditional teaching methods and techniques, it is known that utilizing technological course materials in foreign language teaching has an important place in terms of permanent knowledge, course motivation and multidimensional development (Anderson, 2003). Foreign language teaching methods are constantly changing and developing in parallel with scientific and technological advances. Technology developing at a dizzying pace, especially advances in communication technology, have brought all people on earth closer to each other despite the borders separating countries, and people have started to need a foreign language more in order to be instantly informed about developments, to communicate with each other, and to facilitate interaction between countries and cultures (Siemens, 2014).

The term bilingual is an umbrella word used to describe the same concept as bilingual or multilingual (Baker, 2011). Although the definition of bilingualism has been debated in many different dimensions for many years, today, individuals who regularly use more than one language in their daily lives are considered bilingual. According to this definition, which is widely adopted in academic circles, in order to be considered bilingual, an individual does not need to be proficient in all the languages he/she uses in daily life at the same level. Individuals who have different levels of proficiency in the languages in question are considered bilingual if they use both languages in their daily lives (Grosjean, 2010; Lange et. al., 2023).

The call for the introduction of technology into the language classroom has been repeatedly voiced by writers, researchers, government, school administrators, parents and students. Despite this call, few teachers are effectively integrating technology into their curricula (Baker, 2011; Muscat, Lorton & Orler, 1977). Nowadays, with the acceleration of technology and the internet and the widespread use of laptops, tablets and smartphones, foreign

language learners and instructors want to make foreign language teaching more effective by using these equipment. In particular, researchers have focused on mobile-assisted language teaching based on the widespread use of smartphones by young people. It has been argued that technology in foreign language teaching is perceived not only as a tool for language learning but also more generally as a tool for individual and community development (Zhang, Li, Zhu & Su, 2019). Computer assisted instruction can be used to monitor students' language learning process and measure learning outcomes. Students' performance can be easily monitored through digital tools such as learning management systems and student information systems. Computer-assisted instruction provides students with opportunities to learn in different places and at different times. Students can access computer-assisted teaching materials from anywhere and manage their own learning process.

Technology and education, which advance in parallel with the development of countries, directly affect each other, which is why technology-based tools are widely used. As in other countries, computers are one of the most widely used technical tools in learning environments in Kazakhstan and Computer Assisted Foreign Language Teaching has become one of the most widely used methods (Bartram, 2010). The Computer Assisted Foreign Language Teaching method, whose effect on academic achievement is examined, has been successfully used with many learning methods. This method, whose compatibility with teaching methods is taken into consideration, is mostly used in studies in which experimental and control groups are formed and the difference in academic achievement is examined (Field, 2011).

The Importance of Multilingual Education

In the 0-6 age period, which covers early childhood, children's neurons develop and begin to make connections. Preschool is the period when brain development is the fastest and the most effective learning takes place. It is a well-known fact that all the experiences that take place in this period form the basis for future periods (Hall & Verplaetse, 2000). Children who receive multilingual education in this period have much more developed neuronal connections. What we adults should pay attention to is enriching these periods with positive experiences and positive learning environments (Baker & Prys-Jones, 1998).

Research shows that the cognitive development of children with multilingual education is at a higher level than their peers. In other words, multilingual education supports many areas of development such as social, cognitive, and especially academic (Wang, Song, Xia & Yan, 2009). These studies have provided us with a better understanding of the hidden agendas behind language education models and the assumptions followed in language acquisition and teaching. It has also allowed us to better see what the intended outcomes are. For example, dominant-language-only education is not necessarily the education system in which the dominant language is learned best. Likewise, not every model of multilingual education has developed multilingualism (Cenoz & Gorter, 2011; Palmer et al., 2019).

For children to learn a foreign language well and speak it fluently, it is not enough for them to take foreign language classes. They need to hear and use the foreign language in every aspect of their lives. Children strengthen their learning by being exposed to the foreign language every moment and in every lesson at school. On the other

hand, being multilingual contributes to the development of social skills. Children who master a second or third language develop listening and empathy skills. This helps them overcome shyness and take advantage of opportunities when they arise. In addition, multilingualism enables children to better understand their environment in social settings (Smith, 2003; Magnusson & Godhe, 2019; Özcan, 2022). Research shows that multilingual children are superior to monolingual children in understanding the other person's point of view. You don't need to be fluent in a new language to achieve this awareness. Research suggests that the social benefits of multilingualism also accrue to children who had limited exposure to a different language when they were young. While learning multiple languages has a positive impact on children's cognitive development, the basic elements of the mother tongue outweigh those of other languages. Various studies have shown that bilingualism improves cognitive skills such as memory, focus, multitasking, creativity, comprehension and mental flexibility. All these abilities positively affect children's mental development and prepare them for the situations they may encounter in life (Cummins, 1991; Duff, 2019).

A multilingual education program aims to enable children to acquire academic and social achievements determined in accordance with their cognitive development in parallel with their age period in natural, interactive and communicative learning environments in both their mother tongue and foreign language. Children who grow up in a multilingual environment from the moment they are born can acquire both languages naturally (Duarte, 2020; Field, 2011). When it comes to multilingual education in foreign language education, there are many education models with different names. In some of these models, the mother tongue is used only in the transition to education in a second language, while other models are based on learning new languages along with the mother tongue and developing and maintaining a multilingual environment. Accordingly, while transition models generally aim at assimilation under the name of integration, preservation models aim at true multilingualism. Various studies have been conducted on the implementation and results of these models in different parts of the world (Kramsch, 2012; Luk & Bialystok, 2013).

The categorization of the various language education models used in different parts of the world has shown that there is no single right or wrong model in language education and that different models vary according to the characteristics of the regions. Using multilingual education only as a bridge to proficiency in the dominant language undermines both the development of indigenous languages and the intellectual, social and cultural resources that language represents for speakers of these languages (Creese & Blackledge, 2010). Indigenous peoples live in multilingual and changing societies.

The complex relationship between ethnic identity and language presents a significant challenge for indigenous education programs. Where indigenous peoples widely use more than two languages, the "classical" first language-second language model, where the indigenous language is the first language and the dominant language is the second language, can be seriously questioned. It is much more appropriate to develop and implement a multilingual education program instead. One of the approaches followed in Latin America to pursue a more effective path in this regard is known as "intercultural education". Initially limited to education for indigenous peoples and language education, intercultural education now represents a new social model that values diversity and puts diversity at the center of education for all students (May, & Aikman, 2003).

Individual differences affecting success in a foreign language include personality, language ability, motivation, learning styles and strategies, attitudes and beliefs, creativity, anxiety, and similar cognitive and affective characteristics. Among these individual differences, attitudes towards foreign language learning have always been at the center of foreign language research and have been the most researched variables in the context of individual differences. The impact of attitudes towards foreign language learning on academic achievement in foreign language has been clearly expressed by many researchers and strong correlations between attitudes and academic achievement have been reported (Bartram, 2010; Dörnyei & Csizer, 2002). It is known that positive attitudes lead to higher academic achievement and, conversely, negative attitudes lead to a decrease in academic achievement. In this context, although it is quite ambitious, it can be said that language learning without enough positive attitudes is a futile attempt (Morgan, 1993; Oller et al., 1977).It is also of great importance to measure attitudes accurately, which have such an important role in academic achievement in a foreign language. Some researchers have stated that unidimensional measurement of attitudes is not correct, and that attitudes should be measured with multidimensional scales due to their multidimensional structure, and that much better results will be obtained in this way (Balcı & Sünbül, 2015; Masgoret & Gardner, 2003; Renaud, 2013).

As a country that has identified education as a priority factor since the early 2000s, the budget allocated to education in Kazakhstan has been increasing exponentially every year. The high school education period in Kazakhstan is 4 years in total, with 1 year of preparation and 3 years of high school education. Kazakhstan's universities are implementing a program in which the state provides classrooms for students to learn Kazakh, Russian, English and other foreign languages (Kinaci, 2010). 95% of schools across the country utilize the internet. Educational activities in Kazakhstan are managed by the Kazakhstan Ministry of Education and Science from kindergarten to higher education. The Ministry of Education and Science of Kazakhstan has duties such as creating educational policies, making legal regulations on education financing, creating education programs and education standards, preparing measurement and evaluation criteria, supporting education in the Kazakh language and signing international education agreements (Kaplankiran, 2017). If we briefly list the gains of multilingualism, we can list the positive values in different areas such as identity formation, gaining self-confidence, seeing oneself as equal to the dominant group, being successful in the field of communication and career ladder, that is, in the business world (Holland, 1994).

Multilingual education is an education system that teaches students in more than one language. This enables students to better adapt to cultural and linguistic diversity and to communicate better in a global society. A society that already harbors different languages and cultures will gain in many areas, from economic to welfare, when it is able to use these languages and cultures as an extra dynamic. In order to achieve this, a healthy intercultural communication on the common ground (official language and culture) is essential (Cummins, 2014; Genesee, 2004; Kramsch, 2013; Valdes, 2001). The implementation of computer-assisted instruction in multilingual education, which is one of the main variables of this study, can help improve students' language skills and increase students' motivation towards the learning process. It can also help students learn more about different languages and increase learning opportunities (Beatty, 2013; Pokrivčáková, 2019; Warschauer & Kern, 2000; Zhang & Zou, 2022).

In this context, to what extent do computer-assisted and traditional teaching methods in a multilingual education environment affect students' language achievement and attitudes? An answer to this question was sought. On the basis of this research problem, answers to the following sub-problems were sought in the study:

- Is there a significant difference between the Kazakh language achievement of the student group in which computer-assisted instruction is applied in a multilingual education environment and the student group in which the traditional teaching method is applied?

- Is there a significant difference between the Russian language achievement of the student group in which computer-assisted instruction in a multilingual education environment is applied and the student group in which traditional teaching method is applied?

- Is there a significant difference between the English language achievement of the student group in which computer-assisted instruction was implemented in a multilingual education environment and the student group in which the traditional teaching method was implemented?

- Is there a significant difference between the attitudes towards multilingual education of the student group in which computer-assisted instruction was applied and the student group in which traditional teaching method was applied?

Method

The research problem of the study examines the effect of computer-assisted and traditional teaching methods on students' language achievement and attitudes in multilingual educational settings. The most appropriate research method for this topic is experimental research. Experimental research is a research method in which controllable variables are used. In this method, researchers teach a course to a group of students using computer-assisted instruction, while a control group learns the same course using the traditional method. Thus, they can compare the effects of both methods on students' language achievement and attitudes (Li & Zhang, 2010). This method allows researchers to determine the cause and effect relationships of the research. Moreover, the use of controllable variables allows for accurate interpretation and generalization of the results. This type of research can contribute to the accumulation of knowledge in the field of language learning and provide important information about the effectiveness of teaching methods in multilingual educational settings (Doughty & Long, 2003).

Within the scope of the experimental research model, since one of the classes in the school where the application was carried out was selected as the experimental group and the other as the control group, it can be said that the research design is a "quasi-experimental design" with unequal control groups. Two groups, one experimental group and one control group, were formed by unbiased assignment method, and the same tests were applied to the two groups selected for each year before and after the study and measurements were made. In quasi-experimental design studies, pre and post-tests are applied to both groups, but only the experimental group is administered the method (Creswell 2003).

In order to implement the research titled "The Effect of Computer Assisted Instruction on Achievement and Attitudes in Kazakh, Russian and English Lessons", teacher training language departments of universities in

Astana were examined. Among these schools, a university that actively uses computer laboratories was selected. The necessary official correspondence was made to conduct the study in the selected language department. The instructors of the language departments of the relevant university were interviewed and informed about the study and their opinions were taken. As the research unit, 6-week units of Russian, Kazakh and English courses of the language department were selected. The computer laboratory where the application would be carried out was examined and the usability of the existing language course software was checked. Experimental group and control group classes were determined in the language department. Basic computer skills training was applied to the pre-service teachers and instructors in the experimental group class, and how to realize computer-assisted language teaching applications was taught with examples. In a six-week period, the experimental group received computer-assisted language lessons while the control group received traditional language lessons. At this stage, the process of determining and implementing the language teaching software was realized.

The university where the research was conducted has a computer network that works with multiple operating systems. Considering the computer infrastructure of the Implementation School, Kazakh, Russian and English course software that will realize the objectives of the language courses were searched. In this context, 3 different online software were accessed. These software were found to be sufficient for multilingual education by Kazakh, Russian and English instructors and subject area experts.

The lessons were conducted in an environment where there was a computer for each student and each student could interact with the computer one-to-one. The lecturers introduced the topic and explained basic vocabulary, sentence, paragraph structures and grammar rules, then the topics were given to the students interactively in the computer environment, and then the presentation of the courseware was started. At appropriate intervals, question-answers and discussions were held on the online software. At the end of the lecture sessions, students took computer-assisted quizzes in Kazakh, Russian and English. The results of the computer-assisted assessment were reviewed and discussed by the class in each language. All these processes were carried out simultaneously in the control groups in the same time as the traditional teaching practices.

The population of the research consists of second-year pre-service teacher students studying in language departments of universities in Kazakhstan. The study group of the research consists of pre-service university students studying at a university in Astana in the second year of the 2022-2023 academic year. One of the two 2nd grade classes in the language department was randomly selected as the experimental group and the other as the control group. Pre-service teacher students who participated in all pre and post-tests were included in the study. The experimental group consisted of 32 students (17 girls and 15 boys) and the control group consisted of 32 students (16 girls and 16 boys). In this context, a total of 64 students participated in the experimental applications of the study.

Data Collection Tools

Kazakh, Russian, English Language Attainment Test and Attitude towards Multilingual Education Scale were used to obtain the experimental data of this study.

Kazakh Language Achievement Test

The Kazakh Language Attainment Test was prepared by the research group and the group of instructors of the subject area of this course. By preparing a specification table for the relevant unit of the 2nd grade Kazakh language course, a question pool of 40 questions was created to measure the critical ones for each objective and especially for cognitive objectives at the level of knowledge, comprehension and application. The test includes vocabulary, grammar, sentence and paragraph analysis, translation questions from Kazakh to Russian and Kazakh to English. The opinions of Kazakh instructors and experts (lecturers) were consulted about the suitability of the questions for the purpose of the test, content validity and scientific accuracy. As a result of the studies, a Kazakh language achievement test with 30 items was created. The reliability coefficient of the test (KR-20) was found to be 0.86.

Russian Language Achievement Test

A five-choice multiple-choice achievement test consisting of 35 questions was prepared to measure the achievement level of the students in Russian language skills. For the content validity of the test, it was ensured that the test items were balanced in terms of grammar, translation from Russian to Kazakh, translation from Russian to English and reading comprehension, and that each of the test items was capable of measuring behaviors. Accordingly, the test was presented to subject matter experts and classroom teachers. The test was finalized in the light of the opinions obtained. As a result of expert evaluations, the number of questions in the Russian language test was reduced to 30. Regarding the reliability of the Russian Language Achievement Test, the Russian Language Achievement Test was administered to 40 students who were similar to the group in the study and who were attending the second year of the university, and the reliability of the test was tried to be determined by dividing the test into two halves (Chakrabartty, 2013). As a result of the reliability study, the reliability coefficient of the Russian language achievement test was found to be .85. These values were considered sufficient for the reliability of the Russian language test.

English Language Achievement Test

In order to determine students' academic achievement in English, a five-choice multiple-choice test developed for the units that were used as the basis for the experimental applications of the study was used. The trial form of the test consisted of 35 multiple-choice items developed by the researcher. In the preparation of the test, the university 2nd grade English textbook and the workbook of the same book were utilized. Items with an item discrimination index (rpb) above .30 were included in the main form of the test. The average difficulty of the test (Pj) was calculated as .48.

Based on the item discrimination indices, 30 items were included in the final test. In the 30-item test, one point was given for each correct item. In this way, the highest total score obtained from the test was determined as 30. The KR20 formula (Charter, 1995) was used to determine the reliability of the test. As a result of the statistical analysis, the reliability coefficient of the test was found to be .86. The statistical analysis showed that the KR20

reliability of the draft test was .86; the average difficulty was .48 and the average discrimination was .42. Accordingly, it was concluded that the 2nd grade English course achievement test draft had "high" level reliability, "medium" level difficulty and "high" level discrimination power.

Attitude Scale towards Multilingual Education

The attitude scale towards multilingual education was developed by the researchers. In order to develop this attitude scale, firstly, students in the language and literature departments of universities were asked to write an essay about their feelings and thoughts on multilingual education. From the essays analyzed by content analysis, 40 positive and negative items were pooled and then 30 positive and negative attitude items were formed by taking advantage of the opinions of language field lecturers. Care was taken to ensure that the prepared items included cognitive, affective and behavioral expressions. During the creation of these items, the necessary literature was reviewed and attitude scales developed in Kazakh, Russian and English were examined (Calafato, 2020; Dörnyei & Csizér, 2002; Li & Wei, 2022; Makarova, Terekhova & Mousavi, 2019; McKenzie, 2010; Ou & Gu, 2020; Polatova et al., 2020; Redinger, 2010; Valieva et al., 2019; Zhunussova, 2021). While creating the attitude items, it was paid attention that the items were expressed positively and negatively and that there were no factual statements. Scale items were expressed in a simple and understandable language. Care was taken not to have more than one judgment/thought/emotion in an item. For the positive items used in the scale, the expressions "completely agree" (5) and agree (4) were used; for the negative items, the expressions "strongly disagree" (1) and "disagree" (2) were used. For items that do not contain a positive or negative opinion, the expression "undecided" (3) was used.

Validity is a concept related to the extent to which the test accurately measures the desired characteristic of the individual. One of the methods frequently used to test content validity, which is an indicator of whether the items that make up the test are sufficient in terms of quantity and quality to measure the desired behavior to be measured, is to consult expert opinions (Dunst, Jenkins & Trivette, 1984). The 30-item draft scale was revised in line with the opinions and suggestions of three faculty members working in the field of Kazakh, Russian and English education, five graduate students, three instructors working in different secondary schools and measurement and evaluation experts. After 5 items were removed from the scale based on expert opinions, it was reorganized and made ready for the pre-test phase as a draft scale containing 25 attitude sentences. Eighteen of the items contained positive and seven negative statements. These items were randomly ordered.

Exploratory factor analysis based on principal component analysis method was applied to examine the construct validity of the scale. Since attitudes in Likert-type attitude scales are calculated by the sum of the degrees given to the items, the "recode" feature of the SPSS program was used to convert negative items into 1, 2, 3, 4, 5 points. The scale was analyzed using the SPSS package program. Factor analysis revealed that the scale had a unidimensional structure. Cronbach Alpha internal consistency coefficient was calculated for the reliability calculation of the finalized scale after factor analysis. In the internal consistency study conducted to determine the reliability of the scale of attitudes towards multilingual education, the Cronbach Alpha Internal Consistency coefficient of the scale was found to be 0.90.

Data Analysis

The data obtained from the Kazakh, Russian and English language achievement tests and the attitudes towards multilingual education scale were analyzed using the SPSS statistical package program. In the analysis of the data, "t" test was used to test whether there was a significant difference between the achievement scores of the students in the experimental and control groups.

Findings

As seen in Table 1, when the t-test analysis of the pre-test Kazakh, Russian and English scores of the control and experimental groups is analyzed, the difference between the groups in which the computer-assisted instruction method and the traditional method were applied before the start of the experimental procedures and teaching was not found to be significant (P>0.05). This result shows that the Kazakh, Russian and English entry levels of the groups were close to each other. Thus, the initial language levels of the groups are accepted as equal and the result of the experimental study is reached by looking at the difference between the post-test scores.

Table 1. t-test Results of the Pre-Test Language Scores of the Students in the Control and Experimental Groups

Pre-Test	Group	N	Mean	Std. Deviation	t	P
Kazakh	Control	32	16.13	2.00	1.242	0.219
	Experimental	32	15.56	1.61		
Russian	Control	32	13.44	2.12	-0.388	0.699
	Experimental	32	13.63	1.72		
English	Control	32	12.88	2.12	-0.267	0.790
	Experimental	32	13.00	1.59		

As seen in Table 2, when the t-test analyses based on the pre-test score results of the control and experimental groups towards multilingual teaching are analyzed, the difference between the groups in which computer assisted instruction method and traditional method were applied before starting the experimental procedures and teaching was not found significant (P>0.05). This result shows that the attitude levels of the groups towards multilingual teaching were close to each other at the beginning. Thus, the initial attitudes of the groups are accepted as equal and the result of the experimental study is reached by looking at the difference between the post-test attitude scores.

Table 2. t-test Results of the Pre-Test Attitude towards Multilingual Education Scores of the Students in the Control and Experimental Groups

Pre-Test	Group	N	Mean	Std. Deviation	t	P
Attitude	Control	32	2.84	0.57	-1.577	0.120
	Experimental	32	3.09	0.69		

As seen in Table 3, as a result of the t-test analysis based on the post-test results, a significant difference was

found between the group taught with computer-assisted instruction and the group taught with traditional instruction (P>0.05). As a result, it was revealed that there was a significant difference between the achievement level of the group (experimental group) who was taught with computer-assisted instruction method and the achievement level of the group (control group) who was taught with traditional instruction method, in favor of the experimental group.

Table 3. t-test Results of Post-Test Kazakh Language Scores of Students in Control and Experimental Groups

Post-test	Group	N	Mean	Std. Deviation	t	P
Kazakh	Control	32	18.00	2.37	-7.215	0.000
	Experimental	32	22.75	2.87		

As seen in Table 4, as a result of the t-test analysis based on the post-test results, no significant difference was found between the group taught with computer-assisted instruction and the group taught with traditional instruction in terms of Russian language acquisition (P>0.05). As a result, it was revealed that there was a significant difference, in favor of the experimental group, between the achievement level of the group taught with computer-assisted instruction method (experimental group) and the achievement level of the group taught with traditional instruction method (control group) in terms of Russian language access.

Table 4. t-test Results of the Post-test Russian Language Scores of the Students in the Control and Experimental Groups

Post-test	Group	N	Mean	Std. Deviation	t	P
Russian	1	32	16.25	2.71	-7.860	0.000
	2	32	21.09	2.19	-7.860	0.000

As seen in Table 5, as a result of the t-test analysis based on the post-test results, no significant difference was found between the group taught with computer-assisted instruction and the group taught with traditional instruction in terms of English language acquisition (P>0.05). As a result, it was revealed that there was a significant difference, in favor of the experimental group, between the achievement level of the group taught with computer-assisted instruction method (experimental group) and the achievement level of the group taught with traditional instruction method (control group) in terms of English language access.

Table 5. t-test Results of Post-Test English Language Scores of Students in Control and Experimental Groups

Post-test	Group	N	Mean	Std. Deviation	t	P
English	Control	32	15.50	2.48	-3.209	0.002
	Experimental	32	17.09	1.33		

As seen in Table 6, as a result of the t-test analysis based on the post-test results, no significant difference was found between the group taught with computer-assisted instruction and the group taught with traditional instruction in terms of attitudes towards multilingual education (P>0.05). As a result, it was revealed that there was a significant difference, in favor of the experimental group, between the post-test scores showing the attitudes

towards multilingual education of the group (experimental group) taught with computer-assisted instruction method and the post-test scores showing the attitudes of the group (control group) taught with traditional instruction method.

Table 6. t-test Results of the Post-Test Attitude towards Multilingual Education Scores of the Students in the Control and Experimental Groups

Post-test	Group	N	Mean	Std. Deviation	t	P
Attitude	Control	32	3.75	0.57	-2.499	0.015
	Experimental	32	4.16	0.72		

In general, computer-assisted instruction based on multilingual education increased students' Kazakh, Russian and English language access and positively affected their attitudes towards multilingual education compared to traditional instruction.

Discussion and Conclusion

In this study, which examined the effects of computer-assisted instruction in multilingual education compared to traditional instruction, students' learning gains and attitudes in three languages (Kazakh, Russian and English) were examined. According to the findings of the study, the participating university students achieved high language achievements and attainments in Kazakh as their mother tongue and in Russian and English as foreign languages with the effect of computer-assisted instruction. These findings are similar to the findings of Garcia (2009), Gu & Johnson (2014), Lee (2016), Lim (2002), Liu & Liu (2019), Wang & Huang (2015), Yang & Chen (2018).

Multilingual education is an education system that enables students to receive education in more than one language (Garcia, 2009). Computer-assisted instruction involves the use of computer technologies in the learning process and enriches students' language learning experiences. The impact of computer-assisted instruction in multilingual education depends on several different factors (Gu & Jhonson, 2014). Computer-assisted instruction gives students access to different learning materials. These materials enable students to easily switch between languages and improve students' reading, listening and writing skills in different languages. Therefore, computer-assisted instruction can reduce the difficulties students face in the language learning process in multilingual education (Lim, 2002; Wang & Huang, 2015).

According to Wang & Huang (2015), computer-assisted instruction can make students more productive in the language learning process. These technologies can make the learning process more engaging by providing interactive materials, games and exercises that help students develop their language skills. The computer-assisted instruction employed in the experimental applications provided students with the opportunity to learn more than one language in a relevant and interactive way. Therefore, computer-assisted instruction provided language learning richness by providing students with the opportunity to learn different languages simultaneously and easily. On the other hand, it was observed that a better communication environment emerged among the students

in the experimental applications: In multilingual education, students who speak different languages performing activities together on a computer-assisted instruction platform positively affected their gains in all languages.

In the application, students translated in Kazakh, Russian and English using digital tools in the computer-assisted instruction environment. In the experimental group, students tried to improve their reading, writing, listening and speaking skills with computer-assisted instruction applications. In this respect, computer-assisted instruction provided students with interactive materials to learn vocabulary and grammatical structures in three different languages. All these had a high and positive impact on students' Kazakh, Russian and English language skills.

In the study, students obtained the highest average scores in terms of language access in their mother tongue, Kazakh. In addition, according to the research data, it was observed that students with high scores in Kazakh also had high scores in Russian and English. This situation was especially noticeable in the experimental group. The importance of mother tongue in multilingual education is emphasized in many studies. Mother tongue plays an important role in children's language development and is a fundamental building block for the development of language skills. The mother tongue is a fundamental tool for children to understand and express the world and can be used as an important resource when learning a new language (Baker, 2011). Many studies show that mother tongue has an important role in the learning process. For example, students with strong mother tongue tend to be more successful when learning a foreign language. Also, students who are involved in the learning process with their mother tongue tend to make faster progress in learning a foreign language (Gogolin, 2017). The use of the mother tongue in multilingual education can help children learn other languages more effectively. The use of the mother tongue helps develop skills such as comprehension, vocabulary and grammar when learning a new language (Garcia & Wei, 2014).

Another finding of the study is the effect of computer-assisted instruction on students' attitudes towards multilingual education compared to traditional instruction. According to the findings of the study, the students in the experimental group who received computer-assisted instruction developed more positive and high level attitudes towards multilingual education compared to their peers in the control group who received traditional instruction. These findings are similar to the results of studies conducted by Almekhlafi (2006), Blume (2020), Brett (1996), Hsu (2013), Korkmaz (2013), Nasri, Shafiee & Sepehri (2021), Rico García & Vinagre Arias (2000), Son & Keum (2019), Warschauer & Matuchniak (2010). As Son & Keum (2019) and Rico García & Vinagre Arias (2000) emphasize in their studies, computer-assisted instruction uses different learning methods such as games, interactive activities and simulations to improve students' language skills. These methods increase students' motivation and make learning more fun. Thus, learners enjoy the learning process more when switching between languages. As Nasri, Shafiee & Sepehri (2021) state in their study, computer-assisted instruction can increase students' motivation to learn languages. The fact that educational materials are interesting and interactive can make students want to learn more.

In all these aspects, computer-assisted instruction in a multilingual education environment can increase students' motivation towards language learning by increasing their participation in the learning process. Students can have more fun in the learning process by working at their own pace and learning through interactive games and

activities. According to Hsu (2013), self-confidence in language learning can significantly affect students' success. Computer-assisted instruction can help students perform better by increasing their self-confidence in language learning. On the other hand, it was observed that the participant students' awareness of language diversity increased during the experimental applications carried out in this study. Computer-assisted instruction contributed to the students' knowledge about different languages. This may help students to develop more awareness about their own languages and cultures and to be open to other languages and cultures. For these reasons, the application of computer-assisted instruction in multilingual education can help improve students' language skills and increase students' motivation towards the learning process. It can also help students to learn more about different languages and increase their learning opportunities.

The importance of mother tongue in multilingual education is of great importance for language learning and language development. Mother tongue is an important factor that has a direct impact on a person's cultural identity, communication ability and learning capacity (Cummins, 2009; Garcia & Wei, 2014). The importance of mother tongue is important not only for language learning but also for students to preserve their identity and cultural heritage. Students who preserve their mother tongue have a more culturally rich experience and develop their language skills better (Skutnabb-Kangas, 2009). The importance of the mother tongue in multilingual education is an undeniable fact and is crucial for the success and cultural richness of the learning process.

In conclusion, this study has presented different perspectives on the effects of computer-assisted instruction in multilingual education and emphasizes the importance of the findings in this field. Computer-assisted instruction facilitates students' language learning process in multilingual education and makes learning more enjoyable. However, the effect of this method may vary depending on students' language learning skills and learning styles. Therefore, computer-assisted instruction should be used only as a tool in multilingual education and should be adapted to suit the needs of the learners.

Notes

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