

## Technology of forming multilingual competency of biology students

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### Abstract

The purpose of this research; the aim of this study is to evaluate the views of biology students on the technology of creating multilingual competencies. In this study, phenomenology design, one of the qualitative research methods, was preferred. The study group of the research consists of 80 biology students studying in biology departments at universities in Kazakhstan in the 2022–2023 academic year. The data collection tool of the research is the semi-structured interview form developed by the researchers. The content analysis method was used in the analysis of the research data. As a result of the research; it has been revealed that the majority of biology students participating in the research have moderate multilingual proficiency. The majority of biology students who evaluated the possibilities of creating multilingual competence in universities stated that they also found these opportunities at a moderate level. Regarding their motivation to benefit from multilingual competence-building technology, the majority of biology teachers stated that they were highly motivated. The results obtained from the research necessitated the reorganisation of the education given to biology students in universities in order to gain multilingual competence.

Keywords: Multilingual competence, technology, biology students;

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## 1. Introduction

Knowing a foreign language or languages has become an important requirement in contemporary societies, and accordingly, more emphasis has been placed on foreign language teaching (Bosa, 2021; Hornberger & Johnson, 2007; Makharova, Nurzhanova, Adilbayeva, Dossanova, & Aimagambetova, 2021). In order to maintain foreign language teaching/learning more efficiently and in a way that can meet the needs of the age, research studies are carried out by different institutions, organisations and individuals in various fields such as pedagogy, linguistics, information technologies and teaching methods (Butler, 2015; Celik-Yavas & Yavuz, 2018; Hamzaoui, 2021).

### 1.1. Theoretical and conceptual framework

In today's global world, language has gotten rid of the perception of being only a tool for communication and has taken on the task of a versatile tool that provides transfer and sharing between people, cultures and civilisations (Anastasiadou & Tiliakou, 2016; Golabi & Hajilou, 2015; Uzunboylu & Genc, 2017). We live in a world where linguistic diversity is intense, as well as continuous communication and interaction between societies and individuals with this linguistic diversity (Chen, Dervin, Tao, & Zhao, 2020; Mahboob & Cruz, 2013; Prediger, 2018). For this reason, while foreign language teaching is increasing day by day, teaching/learning not only the teaching/learning of standard languages but also the use of language in social contexts has gained importance (Goldman, Kuo, Pozos, Mesinas, & Lange, 2020; Ibrahim & Gwandu, 2016).

Teaching the language in the context of multilingualism and multiculturalism in the foreign language classroom seems to be more effective (Pakarinen & Björklund, 2018). In addition to teaching the foreign language, taking into account the level and needs of the student, it is equally important to teach language sections used by different social environments within the cultural context (Lee & Shin, 2008; Meyer, Gekeler, Manger, & Urank, 2013). Because it is not enough to teach the standard language in a uniform way. Considering these developments and needs, effective foreign language teaching programs, methods, materials, activities and assessment-evaluation processes should be organised (Kassis-Henderson & Cohen, 2020; Manan, Dumanig, & David, 2017). Multilingualism has a long history, but its visibility has increased recently due to factors such as globalisation and population mobility. According to the Center for Modern Languages of the Council of Europe, more than half of the world's population is bilingual or multilingual (L'nyavskiy-Ekelund & Siiner, 2017).

The phenomenon of using multiple languages, called bilingualism or multilingualism, affects institutions, educational environments and policies in many ways (Zein, 2019). In European countries, learning more than one language has a priority in education policies (Berkel-Otto et al., 2021; Neeta, 2014). Although a learner's multilingualism does not have to be at an excellent level, it refers to the ability to communicate in many languages spoken at the social and individual level (Cervantes-Soon et al., 2021; Salomon, Delgado, & Oliver, 2008).

Multilingualism is the dynamic and evolving linguistic vocabulary of the learner individually in more than one language. At the same time, it is an unstable and variable competence that results from the different natures of one or more languages in which the individual is competent (Creese & Blackledge, 2011; Gopaul-McNicol, 1997). However, the key point here is that multilinguals have a single and interrelated vocabulary that they combine with general competencies and various strategies to accomplish tasks (Henry & Thorsen, 2018).

In classrooms with bilingual or multilingual students, the greatest burden and responsibility undoubtedly falls on teachers. Both pre-service and in-service training processes of teachers who work or will work in such classrooms are an important issue (Dalton-Puffer, 2013; Heugh, 2002).

### *1.2. Related research*

In the literature review, it has been seen that many studies on foreign language learning have concluded that language learning strategies are beneficial in learning a new language (Cohen & Henry, 2019; Ehrman & Oxford, 1990).

Stepp-Greany (2002) conducted a study to determine student attitudes towards a technology-supported foreign language learning environment in which technologies such as Internet activities, CD-ROM, electronic pen pal and thematic discussion are used. Within the scope of the study, a 44-item questionnaire conducted by the researcher was applied to 358 students who attended the Spanish course in which technology-assisted foreign language learning (TDBL) was applied. According to the results of the study, the students found the role of the teachers important in the TDBL environment and stated that their cultural knowledge, listening, reading and independent learning skills improved, but it was understood that the students exhibited an indecisive attitude in some learning experiences and attracting students' attention.

Yang and Chen (2007) conducted a descriptive study to determine the opinions of the participants about the use of Internet tools in foreign language learning activities. The results showed that most of the students enjoyed learning English via the Internet. Although most students stated that the use of the Internet improves and supports foreign language learning, they also stated that technology is not used sufficiently due to limited time, technical problems and limited support from administrators.

Zamari, Adnan, Idris, and Yusof (2012) conducted a study to reveal the attitudes of 97 students who attended foreign language skills reinforcement courses at a university towards online learning material and the difficulties they faced while using this online learning material. According to the results of the research, even when this activity is no longer required for assessment, students were willing to use web-based online learning materials.

### *1.3. Purpose of the research*

The purpose of this research; the aim of this study is to evaluate the views of biology students on the technology of creating multilingual competencies. Within the scope of the research, answers to the following questions were sought.

1. How do biology students evaluate their multilingual competencies?
2. How do biology students evaluate the possibilities of developing multilingual competence in universities?
3. Motivations of biology students to benefit from multilingual competence-building technology?

## **2. Methods and materials**

### *2.1. Research method*

In this study, phenomenology design, one of the qualitative research methods, was preferred. Phenomenology is a research method that uses the experiences of individuals to obtain information about a phenomenon. Although there are many forms of application of phenomenology, subjective experience is given priority in each. Phenomenology is a research model that defines the common

meaning of lived experiences of several people about a phenomenon/phenomenon or concept (Cypress, 2018). The views of the biology students participating in the research on the technology of creating multilingual competence were evaluated in the phenomenology design.

## 2.2. Participants

The research study group consists of biology students studying in biology departments at universities in Kazakhstan in the 2022–2023 academic year. A total of 80 biology students participated in the study. The participant group of the research decided to participate in the research voluntarily. Of the biology students participating in the study, 37 were girls and 43 were boys. All biology students are in their last year of university education.

## 2.3. Data collection tools

The data collection tool of the research is the semi-structured interview form developed by the researchers. A literature review was conducted during the creation of the semi-structured interview form. Afterwards, the draft form was prepared by taking the opinion of two experts. The semi-structured interview form created to collect the research data is given in Table 1.

Table 1. Semi-structured interview form

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### General information

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**Gender:**

#### Research questions

**1. Give your opinion by evaluating your multilingual competence in one of the following options.**

**Very high ( ) High ( ) Medium ( ) Low ( ) Very low ( )**

**Your opinion: .....**

**opinion by evaluating the possibilities of creating multilingual competence of the university you are studying in one of the options below.**

**Very good ( ) Good ( ) Average ( ) Bad ( ) Very Bad ( )**

**motivation to benefit from multilingual competence-building technology by evaluating one of the options below.**

**Very high ( ) High ( ) Medium ( ) Low ( ) Very low ( )**

**Your opinion: .....**

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A semi-structured interview form developed to collect research data is given in Table 1. There are three questions in total in the semi-structured interview form. The questions created were arranged in a way to pre-categorise the evaluations of biology students. In addition to this, each question was arranged in a way to receive the comments of biology students.

## 2.4. Data collection process

In the process of collecting the research data, interviews with biology teachers who agreed to participate in the research voluntarily were held in the university environment. In the interviews held in groups of 7–10 people, the biology students were primarily informed about the purpose and ethical

principles of the research. Then, semi-structured interview forms were distributed and they were asked to fill in. It took approximately 25–30 minutes for biology students to fill out the semi-structured interview forms. It took approximately 1 month to complete the interviews with all students.

### 2.5. Data collection analysis

The content analysis method was used in the analysis of the research data. The process of content analysis is to gather similar data within the framework of certain concepts and themes and to interpret them in a way that the reader can understand (Hsieh & Shannon, 2005). Analysis results are expressed with frequency and percentage values.

## 3. Results

Table 2 presents the evaluations of the biology students participating in the study on their multilingual competencies.

Table 2. Biology students' views on multilingual competencies

Category	Student opinions	F	%
Very high	'I can describe myself as a multilingual person'.	7	8.75
	'I have always been interested in language education. That's why I chose to develop myself'.		
	'Multilingualism is now a requirement of being a global human being. I am an individual who is conscious of this necessity'.		
High	'I feel adequate'.	9	11.25
	'I think I am competent. I am improving myself'.		
	'Multilingualism is an inevitable necessity in multicultural societies. I also describe myself as multilingual'.		
Middle	'I am not as proficient in my mother tongue as I am in my second language'.	43	53.75
	'I do not think that the trainings I have received are very sufficient for me to have full competence in a foreign language'.		
	'I am improving myself, but I cannot say that I am fully competent'.		
Low	'Multilingualism is, in my opinion, proficiency in more than two languages. In this respect, I find myself inadequate'.	16	20
	'I don't think teaching is successful to the extent that language learning is important. Unfortunately, I am at a low proficiency level'.		
	'If we define multilingualism as being equally competent in all languages, I would describe my own competence as low'.		
Very low	'I am not very good at language learning. That's why I rated it	5	6.25

very low’.

‘I do not yet describe myself as multilingual’.

‘To have proficiency in another language requires a lifelong study of a language. Since I do not follow such a path, I am very inadequate in multilingualism’.

<b>Total</b>	80	100
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In Table 2, the evaluations of the biology students participating in the study on multilingual multilingual competencies were evaluated in five categories. 8.75% of biology students rated their multilingual proficiency as very high, 11.25% high, 53.75% medium, 20% low and 6.25% very low.

Table 3 presents the evaluations of the biology students participating in the research on the possibilities of developing multilingual competence at universities.

Table 3. Biology students' views on the possibilities of universities to develop multilingual competence

<b>Category</b>	<b>Student opinions</b>	<b>F</b>	<b>%</b>
<b>Very good</b>	‘I think my university is very competent in building multilingual competence’.	3	3.75
	‘I think there is a pretty good education on this subject’.		
	‘I think that the education I received was very good. I am very pleased’.		
<b>Good</b>	‘The multilingual needs associated with my field are met by my university’.	7	8.75
	‘I am receiving an education in which I can have sufficient knowledge and skills in a second language to be a biology teacher’.		
	‘I think the education I received at school is sufficient’.		
<b>Middle</b>	‘I think the number of courses should be increased in terms of gaining multilingual proficiency’.	51	63.75
	‘I find my university moderately adequate in terms of language education’.		
	‘It's not too bad of course, but I think it's a standard education’.		
<b>Bad</b>	‘The necessary conditions for acquiring multilingual proficiency are not provided by the university I studied at’.	10	12.5
	‘I think it's bad. We receive language training, but it is insufficient’.		
	‘Unfortunately, I don't find it enough. This requires multilingual education’.		
<b>Too bad</b>	‘Universities do not provide an education that will enable them to	9	11.25

gain competence in a different language’.

‘I do not receive multilingual education. It is not possible to have multilingual proficiency without such an education’.

‘I do not think that the language education given is given at a level that will enable students to have multilingual proficiency’.

<b>Total</b>	80	100
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In Table 3, the views of biology students participating in the research on the possibilities of universities to create multilingual proficiency were evaluated in five categories. 3.75% of biology teachers rated the facilities of universities to develop multilingual competence as very good, 8.75% as good, 63.75% as medium, 12.5% as bad and 11.25% as very bad. Table 4 presents the evaluations of biology students participating in the research on their motivation to benefit from multilingual competence building technology.

Table 4. Biology students' motivations to use multilingual competence-building technology

<b>Category</b>	<b>Student opinions</b>	<b>F</b>	<b>%</b>
<b>Very high</b>	‘I would love to be competent enough to provide multilingual education in my field’.	9	11.25
	‘I would absolutely love to. We live in an age where education in one language is not enough anymore. That's why I think multilingualism is very important’.		
	‘I think multilingualism will soon take its place among the teaching competencies. That's why I would love to have multilingual proficiency in order to be a qualified teacher’.		
<b>High</b>	‘I am highly motivated. I think it is important for every prospective teacher’.	62	77.5
	‘Multilingual competency building technology is an area that I am excited about and want to take advantage of’.		
	‘Of course I would like to take advantage. If the university creates the necessary conditions, I would like to benefit from the education that will be given’.		
<b>Middle</b>	‘Motivation to improve myself in this field’.	4	5
	‘Of course it can. I don't want much. It's like I'm a little late. But it can still happen’.		
<b>Low</b>	‘I don't put any extra effort into it actually, but I'm willing nonetheless’.	3	3.25
	‘I guess I'm not very motivated. But if there is an application that can activate my motivation, why not?’		



	'I don't really want to because I think I will have problems with time and planning'.		
	'Actually, I don't want to, but if I get a good opportunity, I can take it'.		
<b>Very low</b>	'I think it's too late to have multilingual competence. That's why I don't have that kind of energy'.	2	2.5
	'I am not very keen'.		
<b>Total</b>		80	100

In Table 4, the motivation of biology students participating in the research to benefit from multilingual competence-building technology was evaluated in five categories. 11.25% of biology students rated their motivation to use multilingual competence-building technology as very high, 77.5% high, 5% medium, 3.25% low and 2.5% very low.

#### 4. Discussions

The vast majority of biology students participating in the study stated that they have moderate multilingual proficiency. Various experts working in the field of language teaching suggest focusing on multilingualism instead of traditional approaches that advocate keeping languages separate from each other in teaching multiple languages (Cenoz & Gorter, 2015; Cummins & Persad, 2014). The vast majority of biology students participating in the research; they stated that universities find the opportunity to create multilingual competence at a moderate level. Studies conducted on the results of multilingual practices in different countries have revealed that schools offer a more successful education chance if students are aware of and evaluate their multilingual repertoire (Sierens & Van Avermaet, 2014). The majority of biology students participating in the study stated that they were highly motivated to benefit from multilingual competence-building technology.

Mikhailova and Duysekova (2022) evaluated technologies for the formation of intercultural professional communication competence in a sample of science students. In the research, modern pedagogical technologies aimed at the formation of intercultural professional and communicative competence in the direction of pedagogical natural sciences among graduates of universities of the Republic of Kazakhstan were evaluated and emphasised the necessity of the education given in universities to be suitable for the multicultural structure. Zamel and Spack (2006) in their study; they explored how it could facilitate the learning of multilingual students at university. In the study, it was emphasised that universities are a very powerful tool to promote language acquisition. Melo-Pfeifer and Chik (2022), in their study, aimed to reveal the views of pre-service teachers in Germany on multilingual learning. The findings obtained from the research reveal that pre-service teachers exhibit beliefs about being multilingual. In addition, it was emphasised in the study that this belief of pre-service teachers should be a starting point to discuss the complexity of being multilingual and the heterogeneity of multilingual structures.

#### 5. Conclusion

Today, the concept of multilingualism emerges as an important concept. The development of technology, the development of mass media, changing economic and sociological conditions and the globalisation of the world have increased the importance of multilingualism. People can become



multilingual individuals for the purposes of communicating in the environment they live in, finding a job and getting to know different cultures. The concept of multilingualism is a subject that needs to be investigated in depth. Therefore, in this study, the views of biology students on the technology of creating multilingual competencies were evaluated. As a result of the research; it has been revealed that the majority of biology students participating in the research have moderate multilingual proficiency. The majority of biology students who evaluated the possibilities of creating multilingual competence in universities stated that they also found these opportunities at a moderate level. Regarding their motivation to benefit from multilingual competence-building technology, the majority of biology teachers stated that they were highly motivated.

## 6. Recommendations

In line with the results obtained from the research, it is revealed that the educational content given to biology students in universities is not sufficient in terms of creating multilingual proficiency. Parallel to this result, the students characterised their multilingual competencies as moderate. Despite these results, biology students were eager to benefit from multilingual competence-building technology. All these results have led to the necessity of reorganising the education given to biology students in universities in order to gain multilingual competence. In addition, bilingual or multilingual applications in other countries should be examined, the working or non-functioning aspects of the applications should be evaluated within themselves, and the working aspects should be utilised while designing the program.

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