Teaching Foreign Languages to Students of the Philological Direction Using the Academic Language

Oksana V. Asadchykh[1]; Liudmyla H. Smovzhenko[2]; Iryna V. Kindras[3]; Ihor I. Romanov[4]; Tetiana S. Pereloma[5]

[1]Department of Languages and Literature of the Far East and Southeast Asia, Taras Shevchenko National University of Kyiv, Volodymyrska Str., Kyiv, Ukraine.

[2]Department of Teaching Methods of Ukrainian and Foreign Languages and Literature, Taras Shevchenko National University of Kyiv, Volodymyrska Str., Kyiv, Ukraine.

[3]Department of Oriental Languages, National Academy of Security Service of Ukraine, M. Maksymovych Str., Kyiv, Ukraine.

[4]Department of Foreign Languages, National Academy of Internal Affairs, Solomianska Sq., Kyiv, Ukraine.

[5]Department of Languages and Literature of the Far East and Southeast Asia, Taras Shevchenko National University of Kyiv, Volodymyrska Str., Kyiv, Ukraine.

Abstract

Modern socio-educational student environment, which stands on communication is based on the exchange of visual images and philological units. Philology students see in communicating with foreign language communicants an opportunity to develop the spoken language of a non-native language, as well as to supplement this knowledge with cultural characteristics and new images. The perception of academically correct lexical group is relevant in combination with spoken language. The novelty of the study lies in the fact that the authors go beyond the stereotype, according to which the academic language is conventionally considered an anachronism and, in general, not an effective means to expand linguistic competence. The article proves that students are ready to learn the academic language not only ion the cultural plane, but also with the help of pedagogical methods. The study also confirms the authors' assertion that it is advisable to introduce an extended learning format into the curriculum in line with the techniques of linguistic learning. The practical value of this article lies in the fact that the study of the academic language by philology students will help them apply the acquired knowledge and skills in different social situations, which are often based on in-depth historical linguistic knowledge.

1. Introduction

The preparation of future philology students for professional communication in philological higher educational institutions is described by multidimensionality (De Costa et al., 2016). Scientific articles of many Ukrainian and foreign researchers cover issues of communication theory, preparation of philology students for communication, including professional communication (Asadchykh, 2017). A confirmation of the special attention to the place of communication in the system of professional training of philology students is the fact that courses on organising communication within the framework of a philological consultation were included in the curriculum of many American and European philological universities (Gardeazabal, 2011).

In Europe, especially in England, Germany, as well as in the United States, the problem of compensatory learning in the native language has been actively discussed for several decades (Romaine, 2006). This problem contributed to the activation of attention to the social determinants of language, allowed scientists of different directions to more adequately understand the role of language in the social life of an individual and society (Yao and Han, 2013). In a somewhat different aspect, the problem of the extralinguistic context of language emerged in connection with the language teaching to students (Ulrih-Atena, 1976) who study in higher educational institutions of the philological profile (Jaspers, 2015). As noted earlier, the efficiency of the business largely depends on how the relations between the communicants develop (Curdt-Christiansen, 2013). The prerequisites for the emergence of positive relations and trust between a specialist and a client are the qualifications, experience and skill of the first, the general atmosphere of the institution, the behaviour of the staff, starting from the reception desk (Asadchykh, 2016).

The professional activity of philology students (including foreign ones) requires a high level of professionalism, education, professional culture (Lee et al., 2019). Hence, the leading task of higher education institutions is to provide highly professional training for specialists in this industry (Berg and Ross, 1982). In the encyclopaedia of professional education professional training is defined as a combination of special knowledge, abilities and skills, qualities, work experience and norms of behaviour that ensure the possibility of successful work in the chosen profession (Fabricius et al., 2017). Scientists understand professional training as a process that contains a system of organisational and pedagogical activities (He and Yu, 2017), which contribute to the development of a person's professional knowledge, skills, abilities, norms of behaviour, work experience and professional readiness, which ensures the possibility of successful work in conditions of a particular profession (Anderson-Levitt, 2014).

One of the priority areas for improving the professional training of philology students is the development of their professionally significant qualities, in particular communicative ones (Yang and Xiang, 2018), since communicative activity is a determining factor in the effectiveness of professional activity (Pérez-Milans, 2015). The profession of a philologist belongs to professions of the "person – person" type, therefore, the professionalism of a specialist depends primarily on their communicative qualities (Moore, 2008), communication style, on the strength of influence on the behaviour of other people and integral sensitivity to the object, process, and result of professional activity (Sutton, 1991).

Professional activity takes place in the interaction of its performers, on the one hand, in contact with related professions, on the other hand, and with the object of activity, on the yet another hand (Konda et al., 2015). This predetermines the attraction of communication (which in turn is a certain type of activity) in the structure of the professional activity of philology students (Wells, 2007).

2. Materials and Methods

To test the hypotheses, the Pearson χ^2 test was chosen. This criterion allows to compare the empirical distributions of two independent samples (CG and EG), by volumes n_1 and n_2. In this study, the number of students in the control (n_1) and experimental (n_2) groups is the same – 160 people, and the sum $n_1 + n_2 = 320$, which proves the validity of the choice of Pearson's test. The results of empirical study for two groups in accordance with four levels are summarised in a table (Table 1).

Table 1 - A Helper Table Template for Calculating the Empirical Value of the Pearson χ^2 Test

Group	The level of the studied trait				Σ
	High	Sufficient	Average	Low	
CG	m_{11}	m_{12}	m_{13}	m_{14}	n_1
EG	m_{21}	m_{22}	m_{23}	m_{24}	n_2
Σ	$m_{11}+m_{21}$	$m_{12}+m_{22}$	$m_{13}+m_{23}$	$m_{14}+m_{24}$	n_1+n_2

Note: All m_{ij} must satisfy the condition – $m_{ij} \geq 5$.

Based on the data in the Table 1, the empirical value of the cell criterion χ^2_{emp} is calculated according to the formula (1):

$$\chi^2_{emp} = \frac{1}{n_1 n_2} \sum_{i=1}^{k} \frac{\left(n_1 m_{2i} - n_2 m_{1i}\right)^2}{m_{1i} + m_{2i}} \qquad (1)$$

where m_{1i} and m_{2i} are the number of respondents in the first and second groups distributed according to the ith attribute (i=1…4). After calculating the empirical values and the empirical value of χ^2_{emp}, they must be compared with χ^2_{crit} (critical value of the criterion), which is obtained from the table of critical values of the Pearson χ^2 test. This value depends on the number of degrees of freedom (df) and the level of significance (p). The number of degrees of freedom is determined according to the formula: df=k-1, where k is the number of characteristic levels. Since k=4 is the number of levels of readiness to use academic speech, in our case df = 4-1 = 3. For pedagogical research, the significance level is considered to be p = 0.05. From tables of critical values for df = 3 and p = 0.05, cell $\chi^2_{crit} = 7,81$ was found.

If the cell $\chi^2_{emp} < \chi^2_{crit}$, then the H_0 hypothesis on the absence of statistical differences between the results of the students of the control and experimental groups is accepted. If $\chi^2_{emp} > \chi^2_{crit}$, then the H_0 hypothesis on the absence of differences is rejected and an alternative hypothesis H_1 is accepted.

3. Results and Discussion

To experimentally test the effectiveness of the author's conceptual model of developing the readiness of philology students to use academic language, the summative stage of the pedagogical experiment was carried out at the Taras Shevchenko Kyiv National University. For this, the diagnostics of philology students was carried out. The processing of diagnostic results allowed to determine the number and percentage of students with the corresponding levels of development of each component of readiness to use academic language: motivational, cognitive, operational-activity, and reflexive. These data are summarised in Fig. 1.

Figure 1 - Summary Results of the Summative Stage of the Experiment in the Distribution of Philology Students According to the Levels of Development of the Components of Readiness to Use Academic Language
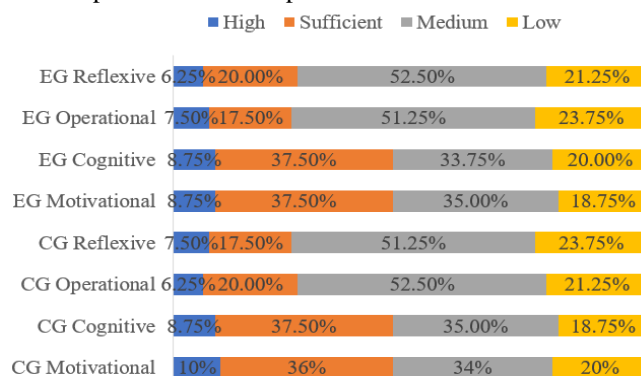
As is evident from Fig. 1, in terms of the components of readiness to use academic language, the CG and the EG do not differ. With regard to the motivational component, a high level was stated among 10% of representatives of the CG and 8.75% of the EG; sufficient – in 36.25% of philology students in the CG and 37.50% in the EG, average – 33.75% in the CG and 35.00% in the EG, low – in 20% in the CG and 18.75% in the EG. The cognitive component at high, sufficient, and low levels is developed in equal numbers among representatives of both groups – 8.75%, 37.5%, and 20%, respectively, on average level – in 35% of philology students from the CG and in 33.75% in the EG. The results of diagnosing philology students by the operational-activity component indicate an insufficient development of readiness to use academic language: a high level was found in 6.25% of representatives of the CG and 7.50% of the EG, sufficient – 20% in the CG and 17.5% in the EG, average – 52.50% in the CG and 51.25% of the EG, low – in 21.25% of the CG and 23.75% of the EG. The reflexive component of readiness to use academic language at a high level was diagnosed in 7.5% in the CG and 6.25% in the EG, sufficient – 17.5% in the CG and 20% in the EG, average – 51.25% in the CG and 52.5% in the EG, low – 23.75% in the CG and 21.25% in the EG. There are only small discrepancies between the compared values, which indicates the homogeneity of the selected control and experimental groups. The worst developed among philology students are the operational-activity and reflexive components of readiness to use academic language.

However, the final conclusion on the absence of differences in the development of the components of readiness to use academic language in the CG and the EG can be drawn only after verifying the statistical hypotheses. The H_0 hypothesis will be formulated as follows: there are only random differences between the results of the level of development of the motivational (cognitive, operational-activity, and reflexive) component in the CG and the EG, obtained at the summative stage of the experiment. Alternative H_1: hypothesis: there are significant discrepancies between the results of the level of development of the motivational (cognitive, operational-activity, and reflexive) component in the CG and the EG, obtained at the ascertaining stage of the experiment. To calculate the empirical value of criterion χ^2_{emp} according to formula (1), the results of diagnosing the development of the motivational component at the summative stage of the experiment were summarised in an auxiliary table (Table 2).

Table 2 - Auxiliary Table for Calculating the Empirical Value of the Pearson χ^2 Test for the Motivational Component (Summative Stage)

Group	The level of the studied trait				Σ
	High	Sufficient	Average	Low	
CG	16	58	54	32	160
EG	14	60	56	30	160
Σ	30	118	110	62	320

Calculation of the empirical value of the criterion:

$$\chi^2_{emp} = \frac{1}{n_1 n_2} \sum_{i=1}^{k} \frac{\left(n_1 m_{2i} - n_2 m_{1i}\right)^2}{m_{1i} + m_{2i}} = 0,27 \qquad (2)$$

Since 0.27<7.81 ($\chi^2_{emp} < \chi^2_{crit}$), the H$_0$ hypothesis is accepted at the summative stage of the experiment on the motivational component. There are no differences between the students from the CG and the EG. To calculate the empirical value of the χ^2 criterion based on the results of the summative stage of the experiment for the cognitive component, an auxiliary table was designed (Table 3).

Table 3 - Auxiliary Table for Calculating the Empirical Value of the Pearson χ^2 Test for the Cognitive Component (Summative Stage)

Group	The level of the studied trait				Σ
	High	Sufficient	Average	Low	
CG	14	60	56	30	160
EG	14	60	54	32	160
Σ	28	120	110	62	320

Calculation of χ^2_{emp} according to the formula (1):

$$\chi^2_{emp} = \frac{1}{n_1 n_2} \sum_{i=1}^{k} \frac{\left(n_1 m_{2i} - n_2 m_{1i}\right)^2}{m_{1i} + m_{2i}} = 0,1 \qquad (3)$$

Since 0.10<7.81 ($\chi^2_{emp} < \chi^2_{crit}$), the H$_0$ hypothesis is accepted at the summative stage of the experiment on the cognitive component. There are only random differences between the CG and the EG. Based on the results of diagnostics of the readiness of philology students to use academic language, the frequency indicators for the operational-activity component are summarised in an auxiliary table, based on which the empirical value of the Pearson criterion is calculated for this component (Table 4).

Table 4 - Auxiliary Table for Calculating the Empirical Value of the Pearson χ^2 Test for the Operational-activity Component (Summative Stage)

Group	The level of the studied trait				Σ
	High	Sufficient	Average	Low	
CG	10	32	84	34	160
EG	12	28	82	38	160
Σ	22	60	166	72	320

Calculation of the empirical value of the criterion:

$$\chi^2_{emp} = \frac{1}{n_1 n_2} \sum_{i=1}^{k} \frac{\left(n_1 m_{2i} - n_2 m_{1i}\right)^2}{m_{1i} + m_{2i}} = 0,69 \qquad (4)$$

Comparison of the empirical and critical values of the Pearson criterion (0.69 <7.81) proves that the H_0 hypothesis is accepted: at the summative stage of the experiment on the operational-activity component of readiness to use academic language, there are no disagreements between the results of philology students from the CG and the EG. To calculate the empirical value of the criterion χ^2_{emp} for the reflexive component of readiness, the results of the summative stage of the experiment are summarised in Fig. 2.

Figure 2 - Calculation of the Empirical Value of the Pearson χ^2 Test for the Reflective Component (Summative Stage)
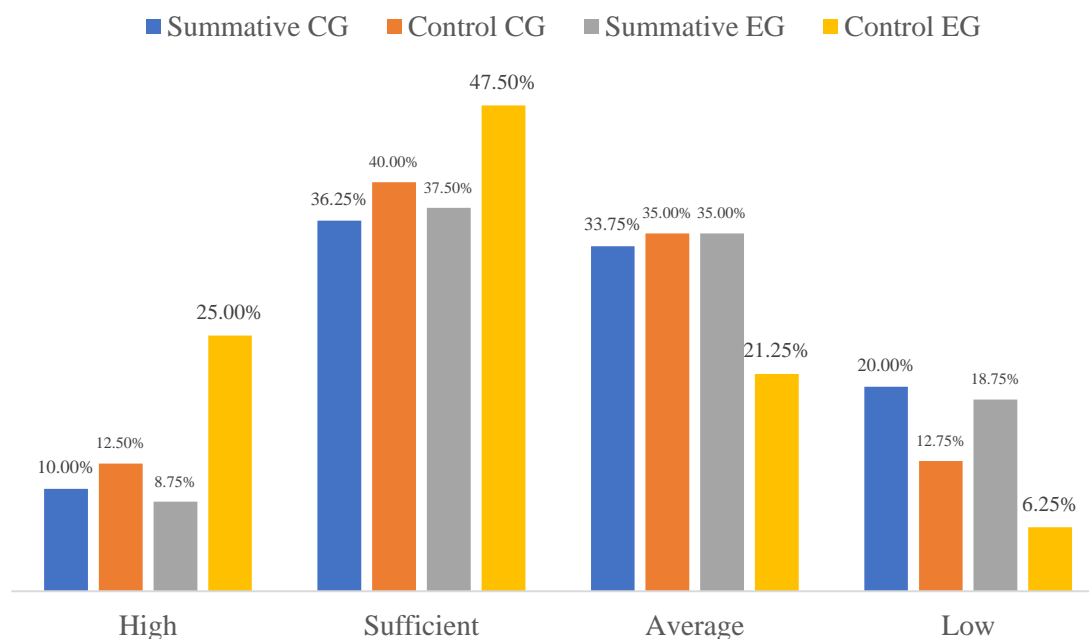
As is evident from Fig. 2, the dynamics of quantitative indicators in the control group (in their comparison at different stages of the pedagogical experiment) was insignificant: the increase in the

results of a high level of the motivational component was 2.5%, sufficient – 3.75%, average – 1.25%, the low-level indicator decreased by 7.5%. This indicates that the motivation for professional communication among future foreign philology students was initially low.

In the experimental group, after the introduction of formative measures, the increase in the results of a high level of the motivational component was 16.25%, sufficient level – 10%. The indicator of the average level decreased by 13.75%, and the low-level indicator – by 12.5%. This indicates an increase in motivation for professional communication among philology students during their studies at a philology university. Among the means that were used upon developing the readiness of philology students for the use of academic language is to encourage them to be active, to be creatively independent, the accumulation of personal experience – dialogical forms and methods (discussions, brainstorming, etc.); training technologies. Fig. 3 presents processed results of diagnosing philology students from the CG and the EG according to the cognitive component of readiness at the stages of the experiment.

Figure 3 - Dynamics of Changes in the Distributions of the Results of Students from the EG and CG According to the Cognitive Component
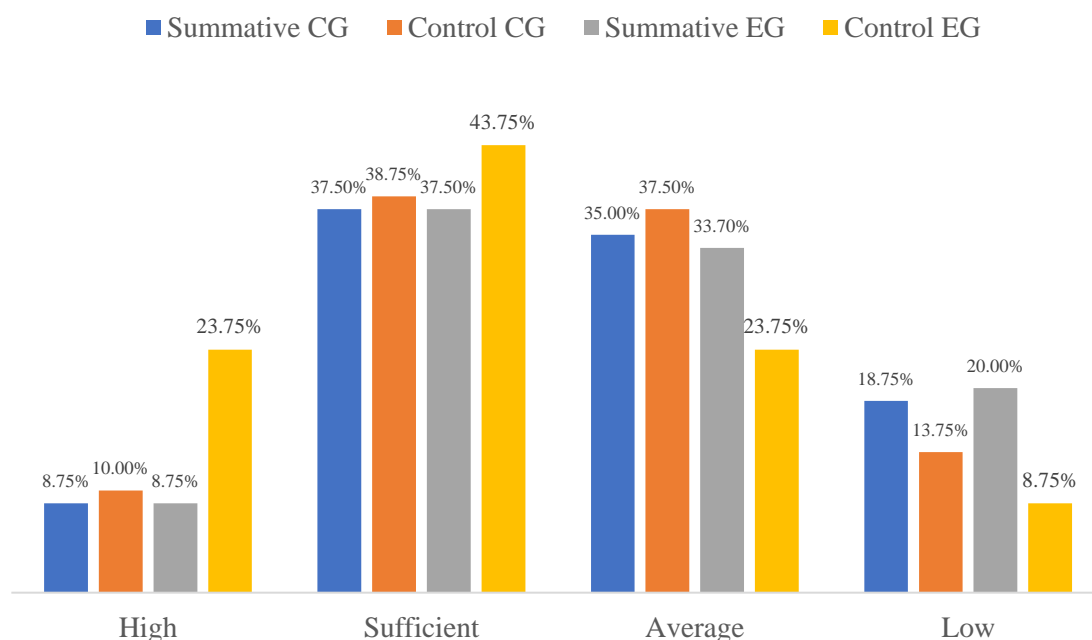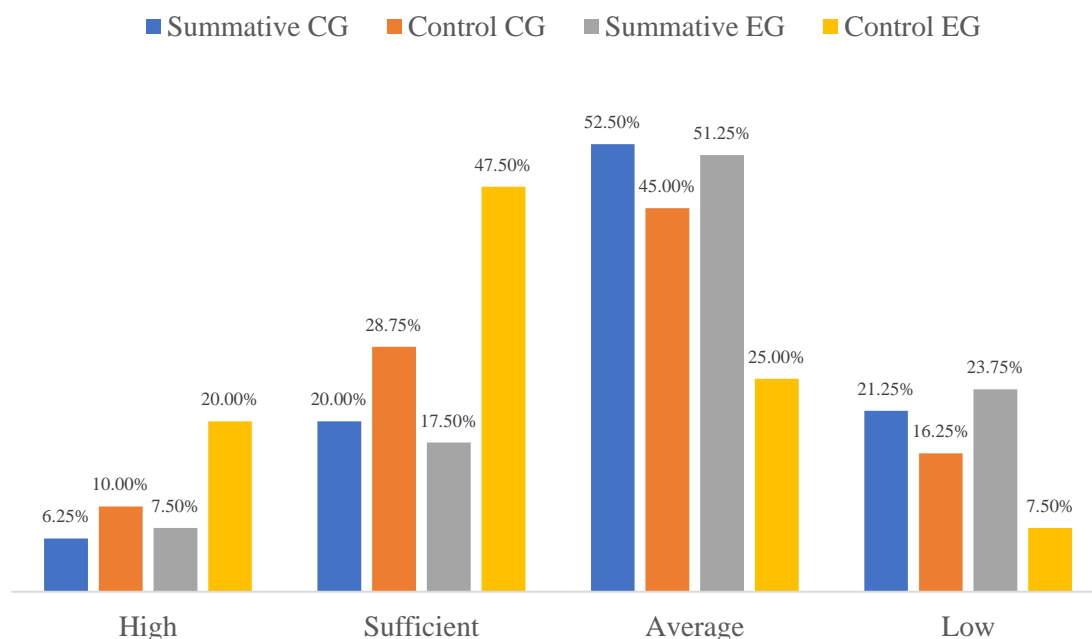

Fig. 4 presents the processed results of diagnosing philology students from the CG and the EG according to the operational-activity component of readiness at the stages of the experiment.

Figure 4 - Dynamics of Changes in the Distributions of the Results of Students from the EG and CG According to the Operational-Activity Component


Observations of the dynamics of the indicators of the operational-activity component of readiness of philology students from the CG for professional communication showed a decrease in carriers of low and medium levels by 12.5%. An increase in the indicator of a sufficient level was recorded (by 8.75%), and the number of philology students with a high level had an insignificant increase (by 3.75%). Observations of the dynamics of indicators of the operational-activity component of readiness in the EG showed its development. There was a sharp decrease (by 16.25%) in students with a low level (from 23.75% to 7.5%), which is 3 times less than the initial results. Significant increases in the number of students with high and sufficient levels have been recorded (by 12.5% and 30%, respectively). Due to this, the indicators of the middle and low levels decreased by 26.25% and 16.25%, respectively.

The development of the operational-activity component of readiness in the experimental group was significantly facilitated by the introduction of interactive methods into the educational process, it was based on the principles of linguistic and interlanguage interaction, pedagogical cooperation between the teacher and students, where all participants in the educational process became subjects of professional training. The organisation of interactive training made provision for the modelling of professional dialogues, the use of computer simulators, etc. Business games played a special role in the development of the operational-activity component of readiness. Fig. 5 presents the processed results

of diagnosing philology students from the CG and the EG according to the reflexive component of readiness to use academic language at the stages of the experiment.

Figure 5 - Dynamics of Changes in the Distributions of the Results of Students from the EG and CG According to the Reflexive Component
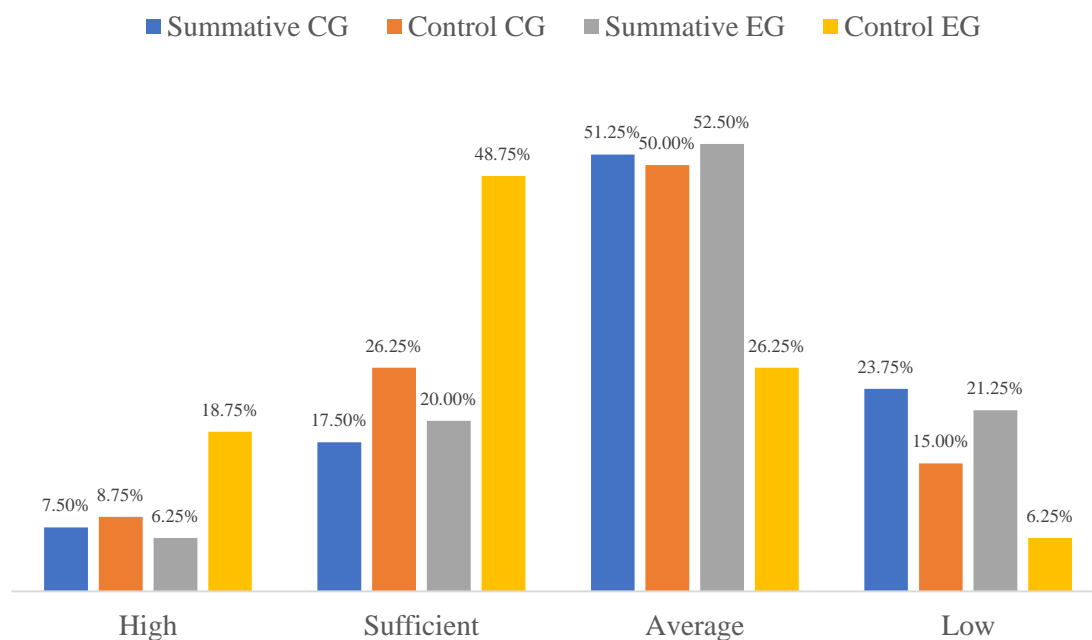
In terms of the reflexive component of readiness of philology students to use academic language, in the CG the increase in the high level of the component was 1.25%, sufficient level – 8.75%. The indicators of the average and low levels decreased by 1.25% and 8.75%, respectively. This indicates that even in the control group, the effectiveness of preparing philology students for the use of academic language by the end of the 3rd year is quite noticeable. According to the reflexive component in the EG, the increase in the results of the high level of the component was 12.5%, sufficient level – 28.75%. The indicators of the middle and low levels decreased by 26.25% and 15.00%, respectively. This indicates that in the experimental group, under the influence of formative activities, the effectiveness of training philology students to use academic language increased significantly.

Comparative analysis of frequencies showed more positive dynamics of changes in the components of readiness to use academic language of students from the EG compared to the CG. However, its results cannot serve as the basis for a final conclusion on the reliability of differences between the development of readiness components at the stages of the experiment in the EG. For this, statistical hypothesis testing is used. Null hypothesis H_0: there are only random differences between

the results of the level of development of the motivational (cognitive, operational-activity, and reflexive) component in the EG (CG), obtained at the stages of the experiment.

Alternative hypothesis H_1: there are significant discrepancies between the results of the level of development of the motivational (cognitive, operational-activity, and reflexive) component in the EG (CG), obtained at the stages of the experiment. To compare distributions in related samples (EG indicators at the stages of the experiment are related samples), the nonparametric Kolmogorov-Smirnov test is used. The empirical value of this criterion is calculated according to the following formula:

$$\lambda_{emp} = \max \left| S(x_i) - S(y_i) \right| \sqrt{\frac{n_1 n_2}{n_1 + n_2}} \qquad (5)$$

Where n_1 and n_2 are the volumes of the compared groups ($n_1 = 160$ and $n_2 = 160$); $S(x_i)$, $S(y_i)$ are accumulated relative frequencies at the ascertaining (x) and control (y) stages, distributed according to the ith attribute (i = 1...4). To calculate the empirical values of the Kolmogorov-Smirnov λ-criterion, the results are summarised in an auxiliary table, the form of which is given in Table 5.

Table 5 - Auxiliary Table Template for Calculating the Empirical Value of the Kolmogorov-Smirnov λ-test

Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$\left| S(x_i) - S(y_i) \right|$
High	$m(x_1)$	$m(y_1)$	$\frac{m(x_1)}{n_1}$	$\frac{m(y_1)}{n_2}$	$f(x_i)$	$f(y_i)$	$\left| S(x_1) - S(y_1) \right|$
Sufficient	$m(x_2)$	$m(y_2)$	$\frac{m(x_2)}{n_1}$	$\frac{m(y_2)}{n_2}$	$S(x_1) + f(x_2)$	$S(y_1) + f(y_2)$	$\left| S(x_2) - S(y_2) \right|$
Average	$m(x_3)$	$m(y_3)$	$\frac{m(x_3)}{n_1}$	$\frac{m(y_3)}{n_2}$	$S(x_2) + f(x_3)$	$S(y_2) + f(y_3)$	$\left| S(x_3) - S(y_3) \right|$
Low	$m(x_4)$	$m(y_4)$	$\frac{m(x_4)}{n_1}$	$\frac{m(y_4)}{n_2}$	$S(x_3) + f(x_4)$	$S(y_3) + f(y_4)$	$\left| S(x_4) - S(y_4) \right|$

For sufficiently large n_1 and n_2 values (over 40), the critical value of the λ-criterion for the significance level p = 0.05 has a stable value – $\lambda_{crit} = 1.36$. If $\lambda_{emp} < \lambda_{crit}$, then the H0 hypothesis on the absence of statistical differences between the results of the group students at the stages of the experiment is accepted. If $\lambda_{emp} > \lambda_{crit}$, then the H_0 hypothesis on the absence of differences is rejected and the alternative hypothesis H_1 is accepted. To compare the development of the motivational component of readiness at the stages of the experiment (summative and control), intermediate calculations were performed for the CG (Table 6) and the EG (Table 7).

Table 6 - Auxiliary Calculations of the Empirical Value of the Kolmogorov-Smirnov λ-criterion for the Motivational Component of Readiness in the CG

Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$|S(x_i) - S(y_i)|$
High	16	20	0.1	0.125	0.1	0.125	0.025
Sufficient	58	64	0.363	0.4	0.463	0.525	0.063
Average	54	56	0.338	0.3	0.8	0.875	0.075
Low	32	20	0.2	0.125	1	1	0

To calculate the empiric value λ_{emp}, the following formula was used:

$$\sqrt{\frac{n_1 n_2}{n_1 + n_2}} = 8,944 \qquad (6)$$

(it is always used henceforth).

$$\lambda_{emp} = 0,67 \qquad (7)$$

Since 0.67<1.36, the H₀ hypothesis is accepted: the results of philology students from the CG at the stages of the experiment on the motivational component of readiness to use academic language do not differ.

Table 7 - Auxiliary Calculations of the Empirical Value of the Kolmogorov-Smirnov λ-criterion for the Motivational Component of Readiness in the EG

Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$|S(x_i) - S(y_i)|$
High	14	40	0.088	0.25	0.088	0.25	0.163
Sufficient	60	76	0.375	0.475	0.463	0.725	0.263
Average	56	34	0.35	0.213	0.813	0.938	0.125
Low	30	10	0.188	0.063	1	1	0

Calculation of the empirical value for the EG for the motivational component: $\lambda_{emp} = 2,34$.

Since 2.34> 1.36, the H₀ hypothesis is rejected and H₁ is accepted: the results of philology students from the EG at the stages of the experiment on the motivational component of readiness to use academic language differ significantly. To compare the development of the cognitive component of readiness at the stages of the experiment, additional calculations were carried out for the CG (Table 8) and the EG (Table 9).

Table 8 - Auxiliary Calculations of the Empirical Value of the Kolmogorov-Smirnov λ-Test for the Cognitive Component of Readiness in the CG

Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$|S(x_i) - S(y_i)|$
High	14	16	0.088	0.1	0.088	0.1	0.013
Sufficient	60	62	0.375	0.388	0.463	0.488	0.025
Average	56	60	0.35	0.375	0.813	0.863	0.050
Low	30	22	0.188	0.138	1	1	0

Calculation of the empirical value of the λ-criterion according to formula (5) for the cognitive component:

$$\lambda_{emp} = 0,45 \qquad (8)$$

Since 0.45 <1.36, the H_0 hypothesis is accepted: the results of philology students from the CG at the stages of the experiment according to the cognitive component of readiness to use academic speech do not differ.

Table 9 - Auxiliary Calculations of the Empirical Value of the Kolmogorov-Smirnov λ-criterion for the Cognitive Component of Readiness in the EG

Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$\lvert S(x_i) - S(y_i) \rvert$
High	14	38	0.088	0.238	0.088	0.238	0.15
Sufficient	60	70	0.375	0.438	0.463	0.675	0.213
Average	54	38	0.338	0.238	0.8	0.913	0.113
Low	32	14	0.2	0.088	1	1	0

Calculation of the empirical value for the EG for the cognitive component: EMP. 0.213 and 8.944 and 1.90.

$$\lambda_{emp} = 0,45 \qquad (9)$$

Since 1.90> 1.36, the H_0 hypothesis is rejected and the H_1 hypothesis is accepted: there are significant disagreements between the results of the development of the cognitive component among students from the EG at the stages of the experiment. To compare the development of the operational-activity component of readiness at the stages of the experiment (summative and control), intermediate calculations were performed for the CG (Table 10) and the EG (Table 11).

Table 10 - Auxiliary Calculations of the Empirical Value of the Kolmogorov-Smirnov λ-criterion for the Operational-activity Component of Readiness in the CG

Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$\lvert S(x_i) - S(y_i) \rvert$
High	10	16	0.063	0.1	0.063	0.1	0.038
Sufficient	32	46	0.2	0.288	0.263	0.388	0.125
Average	84	72	0.525	0.45	0.788	0.838	0.05
Low	34	26	0.213	0.163	1	1	0

Calculation of the empirical value of the λ-criterion: $\lambda_{emp} = 1,19$. Since 1.19 <1.34, the H_0 hypothesis is accepted: the results of philology students from the CG at the stages of the experiment according to the operational-activity component of readiness to use academic language do not differ.

Table 11 - Auxiliary Calculations of the Empirical Value of the Kolmogorov-Smirnov λ-criterion for the Operational-Activity Component of Readiness in the EG

Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$|S(x_i)-S(y_i)|$
High	12	32	0.075	0.2	0.075	0.2	0.125
Sufficient	28	76	0.175	0.475	0.25	0.675	0.425
Average	82	40	0.513	0.25	0.763	0.925	0.163
Low	38	12	0.238	0.075	1	1	0

Calculation of the empirical value for the EG for the operational-activity component: $\lambda_{emp} = 3,80$. Since 2.34> 1.34, the H0 hypothesis is rejected and the H1 hypothesis is accepted: the results of philology students from the EG at the stages of the experiment according to the operational-activity component of readiness differ significantly. To compare the development of the reflexive component of readiness to use academic language at the stages of the experiment, additional calculations were made for the CG (Table 12) and the EG (Table 13).

Table 12 - Auxiliary Calculations of the Empirical Value of the Kolmogorov-Smirnov λ-criterion for the Reflexive Component of Readiness in the CG

Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$|S(x_i)-S(y_i)|$
High	12	14	0.075	0.088	0.075	0.088	0.013
Sufficient	28	42	0.175	0.263	0.25	0.35	0.1
Average	82	80	0.513	0.5	0.763	0.85	0.088
Low	38	24	0.238	0.15	1	1	0

Calculation of the empirical value of the Kolmogorov-Smirnov λ-criterion: $\lambda_{emp} = 0,89$. Since 0.89 <1.34, the H0 hypothesis is accepted: there are no significant differences between the results of philology students from the CG on the reflective component of readiness to use academic language at the stages of the experiment.

Table 13 - Auxiliary Calculations of the Empirical Value of the Kolmogorov-Smirnov λ-criterion for the Reflexive Component of Readiness in the EG

| Level	x_i	y_i	$f(x_i)$	$f(y_i)$	$S(x_i)$	$S(y_i)$	$|S(x_i)-S(y_i)|$
High	10	30	0.063	0.188	0.063	0.188	0.125
Sufficient	32	78	0.2	0.488	0.263	0.675	0.413
Average	84	42	0.525	0.263	0.788	0.938	0.15
Low	34	10	0.213	0.063	1	1	0

Calculation of the empirical value of the Kolmogorov-Smirnov λ-criterion for the EG for the reflexive component: $\lambda_{emp} = 3,69$. Since 3.69> 1.34, the H0 hypothesis is rejected and the H1

hypothesis is accepted: there are significant disagreements between the results of philology students from the EG at the stages of the experiment according to the reflexive component of readiness.

The results of testing statistical hypotheses showed that in the CG at the control stage there were no changes in the development of the components of the readiness of philology students to use academic language. But in the EG the obtained data allowed refuting the null hypothesis and proving the significance of differences in the development of the components of readiness to use academic language at the summative and control stages. This confirms the effectiveness of the implemented conceptual model of developing the readiness of philology students to use academic language.

The data were obtained according to the results of diagnostics of students from the CG and the EG at the control stage of the experiment according to the levels of development of motivational, cognitive, operational-activity, reflexive components of readiness to use academic language and are summarised in Fig. 6.

Figure 6 - Summary Results of the Control Stage of the Experiment of the Distribution of Philology Students According to the Levels of Development of the Components of Readiness to use Academic Language, CG and EG
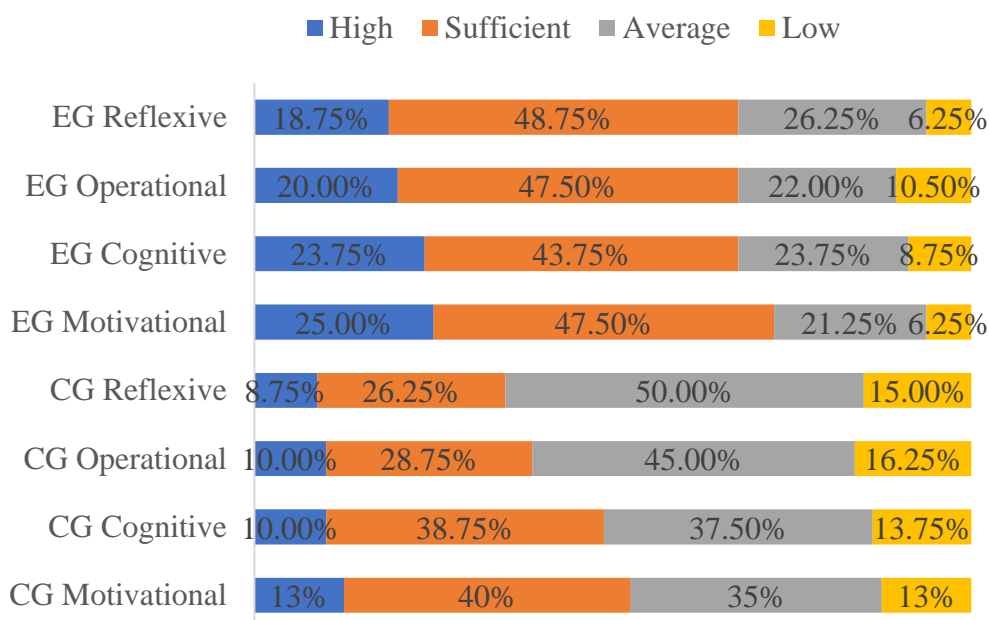
As is evident from Fig. 6, there are discrepancies between the CG and the EG in terms of the components of readiness to use academic language. According to the motivational component, a high level was stated among 12.5% of the representatives of the CG and 25% of the EG; sufficient level – 40% of philology students in the CG and 47.5% in the EG, average level – 35% in the CG and 21.25% in the EG, low level – 12.50% in the CG and 6.25% in the EG. The cognitive component was

at a high level in 10% of students from the CG and 23.75% from the EG; sufficient level – 38.75% in the CG and 43.75% in the EG; average level – in 37.5% in the CG and 23.75% in the EG; low level – 13.75% in the CG and 8.75% in the EG. The results of diagnosing philology students according to the operational-activity component testify to its unsatisfactory development in the CG and good development in the EG: a high level was identified in 10% of students in the CG and 20% in the EG, sufficient level – in 28.75% in the CG and 43.75% in the EG, average level – in 45% in the CG and 22% in the EG, low level – 16.25% in the CG and 7.5% in the EG. The development of the reflexive component at a high level was diagnosed in 8.75% in the CG and 18.75% in the EG, sufficient level – 26.25% in the CG and 48.75% in the EG, average level – 50% in the CG and 26.25% in the EG, low level – 15% in the CG and 6.25% in the EG. Discrepancies between students from the CG and the EG were identified between the frequency indices. The motivational component of readiness to use academic language is better developed in the EG: high and sufficient levels were found in 72.5% of the EG representatives. Other components of readiness (cognitive, operational-activity, and reflexive) at a high and sufficient levels were developed in 67.5% of philology students from the EG.

To avoid randomness in the conclusions, with the use of the Pearson χ^2 test, the statistical hypotheses were tested. Null hypothesis H_0: there are only random differences between the results of the level of development of the motivational (cognitive, operational-activity, and reflexive) component in the CG and the EG, obtained at the control stage of the experiment. Alternative hypothesis H_1: there are significant discrepancies between the results of the level of development of the motivational (cognitive, operational-activity, and reflexive) component in the CG and the EG, obtained at the control stage of the experiment.

The critical value of this criterion is the same as at the summative stage: $\chi^2_{crit} = 7,81$. The procedure for calculating the empirical value is the same as at the summative stage: an auxiliary table is developed, according to which χ^2_{emp} is calculated with the use of the formula (1). To compare the results of the CG and the EG on the motivational component at the control stage of the experiment, they were summarised in an auxiliary table (Table 14).

Table 14 - Auxiliary Table for Calculating the Empirical Value of the Pearson χ^2 Test for the Motivational Component (Control Stage)

Group	The level of the studied trait				Σ
	High	Sufficient	Average	Low	
CG	20	64	56	20	160
EG	40	76	34	10	160
Σ	60	140	90	30	320

Calculation of the empirical value of the criterion:

$$\chi^2_{emp} = \frac{1}{n_1 n_2} \sum_{i=1}^{k} \frac{\left(n_i m_{2i} - n_2 m_{1i}\right)^2}{m_{1i} + m_{2i}} = 16,14 \qquad (10)$$

Since 16.41>7.81 ($\chi^2_{emp} > \chi^2_{crit}$), then the H_1 hypothesis is accepted at the control stage of the experiment on the development of the motivational component of readiness to use academic language, students from the CG and the EG differ. To calculate the empirical value of the χ^2-criterion according to the results of the control stage of the experiment for the cognitive component, an auxiliary table was developed (Table 15).

Table 15 - Supporting Table for Calculating the Empirical Value of the Pearson χ^2 Test for the Cognitive Component (Control Stage)

Group	The level of the studied trait				Σ
	High	Sufficient	Average	Low	
CG	16	62	60	22	160
EG	38	70	38	14	160
Σ	54	132	98	36	320

Calculations according to formula (1):

$$\chi^2_{emp} = \frac{1}{n_1 n_2} \sum_{i=1}^{k} \frac{\left(n_i m_{2i} - n_2 m_{1i}\right)^2}{m_{1i} + m_{2i}} = 16,16 \qquad (11)$$

Since 16.16>7.81 ($\chi^2_{emp} > \chi^2_{crit}$), the H_1 hypothesis is accepted: the students from the CG and the EG have significant discrepancies between the results of the development of the cognitive component of readiness at the control stage of the experiment. Frequency indicators based on the results of diagnostics of the development of readiness of philology students to use academic language for the operational-activity component are summarised in Table. 16.

Table 16 - Auxiliary Table for Calculating the Empirical Value of the Pearson χ^2 Test for the Operational-activity Component (Control Stage)

Group	The level of the studied trait				Σ
	High	Sufficient	Average	Low	
CG	16	46	72	26	160
EG	32	76	40	12	160
Σ	48	122	112	38	320

Calculation of the empirical value of the criterion:

$$\chi^2_{emp} = \frac{1}{n_1 n_2} \sum_{i=1}^{k} \frac{\left(n_i m_{2i} - n_2 m_{1i}\right)^2}{m_{1i} + m_{2i}} = 27,01 \qquad (12)$$

Comparison of empirical and critical values of Pearson's criterion (27.01> 7.81) proves that hypothesis H$_1$ is accepted: at the control stage of the experiment on the operational-activity component of readiness to use academic language, there are significant discrepancies between the results of philology students from the CG and the EG. To calculate the empirical value of the χ^2 criterion for the reflexive component of readiness, the results of the control stage of the experiment are summarised in the auxiliary table (Table 17).

Table 17 - Auxiliary Table for Calculating the Empirical Value of the Pearson χ^2 Test for the Reflective Component (Control Stage)

Group	The level of the studied trait				Σ
	High	Sufficient	Average	Low	
CG	14	42	80	24	160
EG	30	78	42	10	160
Σ	44	120	122	34	320

The calculations are as follows:

$$\chi^2_{emp} = \frac{1}{n_1 n_2} \sum_{i=1}^{k} \frac{\left(n_i m_{2i} - n_2 m_{1i}\right)^2}{m_{1i} + m_{2i}} = 34,22 \qquad (13)$$

Since 34.22> 7.81, the H$_1$ hypothesis is accepted: at the control stage of the experiment on the reflexive component of readiness to use academic language, philology students from the CG and the EG differ significantly.

4. Conclusion

The obtained results of testing statistical hypotheses prove that after the formative stage of the experiment, the control and experimental groups have statistically significant differences, which is explained by the pedagogical effect in connection with the introduction of the proposed conceptual model of the development of philology students' readiness to use academic language.

Consequently, it has been statistically proven that the higher results of the development of the readiness of philology students for the use of academic language in the experimental groups in comparison with the control groups is explained by the pedagogical effect in connection with the introduction of formative measures. This confirms the research hypothesis and the effectiveness of the author's conceptual model of developing the readiness of philology students to use academic language.

References

Anderson-Levitt, K.M. 2014. Significance: recognizing the value of research across national and linguistic boundaries. *Asia Pacific Education Review* 15(3), 347-354. DOI: 10.1007/s12564-014-9322-0.

Asadchykh O.V. 2016. Principles and methods of teaching Japanese academic language to philology students in graduate school. *Collection of Scientific Papers "Pedagogical Sciences"* 74(1): 96-101.

Asadchykh O.V. 2017. Teaching Japanese students for academic purposes: the development of academic literacy. *Science and Education a New Dimension. Pedagogy and Psychology* 52(113): 15-19.

Berg, W.M., and Ross, J.M. (1982). The linguistic organization of public controversy: A note on the pragmatics of political discourse. *Human Studies*, 5(1), 237-248. DOI: 10.1007/BF02127679.

Curdt-Christiansen, X.L. (2013). Family language policy: socio political reality versus linguistic continuity. *Language Policy* 12(1), 1-6. DOI: 10.1007/s10993-012-9269-0.

De Costa, P., Park, J., and Wee, L. (2016). Language learning as linguistic entrepreneurship: implications for language education. *The Asia-Pacific Education Researcher*, 25(5), 695-702. DOI: 10.1007/s40299-016-0302-5.

Fabricius, A.H., Mortensen, J., and Haberland, H. (2017). The lure of internationalization: paradoxical discourses of transnational student mobility, linguistic diversity and cross-cultural exchange. *Higher Education*, 73(4), 577-595. DOI: 10.1007/s10734-015-9978-3.

Gardeazabal, J. (2011). Linguistic polarization and conflict in the Basque Country. *Public Choice*, 149(3), 405-425. DOI: 10.1007/s11127-011-9869-9.

He, M.F., and Yu, M. (2017). Education for cultural and linguistic diversity in the United States in hard times. *Curriculum Perspectives*, 37(2), 205-210. DOI: 10.1007/s41297-017-0027-5.

Jaspers, J. (2015). Modelling linguistic diversity at school: the excluding impact of inclusive multilingualism. *Language Policy*, 14(2), 109-129. DOI: 10.1007/s10993-014-9332-0.

Konda, Y., Miura, Y., and Oi, M. (2015). Causes of academic and behavioral difficulties among Japanese-Brazilian students: cognitive, linguistic and parental education factors. *Multilingual Education,* 5(1), 1-17. DOI: 10.1186/s13616-015-0022-9.

Lee, J.H., Ostwald, M.J., Gu, N., and Roberts, M. (2019). Linguistic and cultural perspectives on globalised design education. *International Journal of Technology and Design Education* DOI: 10.1007/s10798-019-09544-2.

Moore, F.M. (2008). The role of the elementary science teacher and linguistic diversity. *Journal of Elementary Science Education*, 20(3), 49-61. DOI: 10.1007/bf03174708.

Pérez-Milans, M. (2015). Language education policy in late modernity: (socio) linguistic ethnographies in the European Union. *Language Policy,* 14(2), 99-107. DOI: 10.1007/s10993-014-9354-7.

Romaine, S. (2006). Planning for the survival of linguistic diversity. *Language Policy*, 5(4), 443-475. DOI: 10.1007/s10993-006-9034-3.

Sutton, P. (1991). Educational language planning and linguistic identity. *International Review of Education,* 37(1), 133-147. DOI: 10.1007/BF00598172.

Ulrih-Atena, E. (1976). National linguistic minorities: Bilingual basic education in Slovenia. *Prospects*, 6(3), 430-438. DOI: 10.1007/BF02220832.

Wells, G. (2007). Forum: The linguistic construction of expert identity in professor-student discussions of science. *Cultural Studies of Science Education*, 2(1), 151-170. DOI: 10.1007/s11422-007-9051-3.

Yang, H., and Xiang, C. (2018). Approaches to multiple attribute decision making based on the hesitant fuzzy uncertain linguistic information and their applications to teaching quality evaluation in higher education. *Proceedings of the National Academy of Sciences, India Section A: Physical Sciences,* 88(4), 577-583. DOI: 10.1007/s40010-017-0377-2.

Yao, J., and Han, J. (2013). Bilingual beginning mandarin teachers' classroom English in Sydney schools: linguistic implications for teacher education. *The Asia-Pacific Education Researcher,* 22(2), 127-136. DOI: 10.1007/s40299-012-0005-5.