The aim of this qualitative study is to analyse literature on basic research methodology concerning methods, design, types of sampling, the sample size and recent scientific articles in the sphere of language teaching and learning to define current research trends. Twenty articles published in the open access Web of Science indexed journal «Advanced Education» were analysed in terms of scientific methods and sample size used. The journal is semi-annual and peer-reviewed. It highlights the results of scientific research on a wide range of topics in the field of higher education including language teaching and learning. The data was collected through content analysis of twenty publications in language education issued in 2020. Frequencies of methods used and percentages, as well as mean sample size, were calculated. A mixed-method approach was defined as a dominant trend in the majority of articles. It was demonstrated that the learning outcomes coefficient of 0.7 created by Bespalko V. is still used as a reliable way to measure learning outcomes in language teaching and learning research. The mean sample size of the experimental group was defined to be approximately 67 participants. A much bigger sample size was used for surveys. A growth of collaborative research in language teaching and learning was identified as one of the new trends in the sphere of language education in Ukraine. An increase in research cooperation with foreign colleagues was another emerging trend. Poland, the United States, Spain, Turkey, China, and Norway were on the list of research partners. In two out of twenty studies, foreign students were involved as research participants. They were Spanish and Polish learners. Popular methods of qualitative research such as observation, interview, survey, document analysis and the main characteristics of quantitative research were briefly described in the main part of this study based on the personal experience of the authors and analysis of literature dedicated to the theoretical background of research study methods.

**Key words:** method, observation, inductive and deductive reasoning, observational checklists, interview, surveys, qualitative and quantitative research, the sample size.
статьї коротко розглянуті основні методи дослідження, питання об’єму та типу вибірки. Був здійснений порівняльний аналіз 20-ти експериментальних статей з українського наукового журналу «Новітня освіта». Це видання включене до міжнародної бази даних Web of Science та регулярно публікує наукові статті у сфері вивчення та викладання іноземної мови. Проведений порівняльний аналіз зазначених статей дозволив визначити змішаний метод дослідження переважно домінуючим. Також було підтверджено, що все більше вислідувань дослідників співпрацюють з українськими колегами з метою співавторства та спільного проведення експерименту. Подібна тенденція прослідковується щодо співпраці фахівців вітчизняних університетів із зарубіжними колегами.

Ключові слова: метод; спостереження; індуктивний та дедуктивний методи; контрольний лист спостереження; інтерв'ю; опитування; кількісне та якісне дослідження; об’єм вибірки.

Introduction / Вступ. The high status of a classical research university in Ukraine is underpinned by the high-quality academic research conducted by its staff. Scientific research results in language teaching and learning are important indicators of the development in the sphere. They can be used as the basis for future educational improvements.

It is very important to analyse the recent publications in language teaching and learning to define the main trends of research methodology concerning methods, design, types of sampling, and the sample size. Revision of some basic principles of research study is necessary to avoid misinterpretation of the scientific method.

One of the requirements for Ukrainian teachers at the university level is to write scientific articles. An important part of author guidelines in international journals indexed in Scopus or Web of Science is to present authentic study in language teaching or learning describing all the methods and stages of the research. To do so, Ukrainian teachers at the tertiary level should reflect on research planning and understand the current methods used by other authors in the sphere.

Aim and Tasks / Мета та завдання. The aim of this study is to analyse articles published in the Ukrainian journal Advanced Education in 2020 in terms of the research methods and sample size used. An additional task is to identify the current trends in language teaching and learning research in Ukraine.

Methods / Методи. This was a qualitative descriptive study. First of all, a critical analysis of literature dedicated to the theoretical background of research study methods was conducted. Then, the online archive of the Web of Science indexed journal in Ukraine called Advanced Education was accessed to collect data. Content analysis of the twenty articles published in the journal in 2020 in the sphere of language teaching and learning was performed. The information about the sample size and methods used in the studies was collected and analysed.

Results / Результати. Twenty publications on language teaching and learning in the Web of Science indexed journal in Ukraine called Advanced Education (issues in 2020) were analysed (Table 1). The mixed research design turned out to be the most popular in recent research on language teaching and learning (90 % of the articles chosen). 10 % of the articles adhered to one dominant approach without combining qualitative and quantitative methods systematically.

### Table 1

<table>
<thead>
<tr>
<th>Article</th>
<th>Sample size</th>
<th>Methods used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of collaboration, research and mentoring skills of pre-service teachers facilitating ICT learning by older adults</td>
<td>69 students, 54 elderly people</td>
<td>deductive reasoning, analysis of international and national research, narrative interviews, a self-assessment questionnaire, observations</td>
</tr>
<tr>
<td>Forming students’ terminological competence in the Moodle-based e-learning course</td>
<td>68 fourth-year undergraduate students</td>
<td>methods of mathematical statistics, quantitative (experiment, measuring variables, finding frequencies, hypothesis testing) and qualitative methods</td>
</tr>
<tr>
<td>Title</td>
<td>Participants</td>
<td>Methods</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>--------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Use of task-based approach in teaching vocabulary to business English learners at university</td>
<td>34 students</td>
<td>quantitative and qualitative research methods including scientific experiment, questionnaires</td>
</tr>
<tr>
<td>Pre-service teachers training for efficient health-promoting school activities performance</td>
<td>278 randomly selected second and third-year students/respondents</td>
<td>quantitative and qualitative research methods including questionnaires, descriptive statistics.</td>
</tr>
<tr>
<td>Enhancing language and cross-cultural competence through telecollaboration</td>
<td>56 Ukrainian and 56 Spanish students</td>
<td>quantitative methods</td>
</tr>
<tr>
<td>English voice and its prosodic characteristics in teaching oral interpretation</td>
<td>60 BA undergraduate students</td>
<td>mixed (quantitative and qualitative) data assessment using questionnaires, descriptive statistics, and mathematical processing</td>
</tr>
<tr>
<td>Intentional vs incidental ESP vocabulary acquisition by political science students</td>
<td>20 students</td>
<td>the case study employed a quantitative research method to calculate the amount of the target words and collocations used in the written output, and a qualitative method to assess the accuracy of their usage</td>
</tr>
<tr>
<td>Students’ and teachers’ perceptions of using electronic textbooks in the educational process</td>
<td>1125 respondents / students, 60 teachers</td>
<td>methods of mathematical and descriptive statistics, questionnaires, descriptive statistics, and analysis resulting in an interpretation</td>
</tr>
<tr>
<td>Democratic values and digital skills of students in higher educational establishments of Poland and Ukraine</td>
<td>237 Polish students, 230 Ukrainian students</td>
<td>a method of comparative-pedagogical analysis of the results of international studies, critical analysis of foreign and national scientists’ works, and quantitative methods</td>
</tr>
<tr>
<td>Educational technologies in training future managers</td>
<td>50 students</td>
<td>the analysis of electronic resources, conducting an online game analysis and interviewing students</td>
</tr>
<tr>
<td>Differentiated instruction in English learning, teaching and assessment in non-language universities</td>
<td>116 students</td>
<td>the mixture of qualitative and quantitative methods included reviewing literary sources, inducing hypothesis, developing conceptual constructs, and gathering information from respondents. The quantitative research method included entrance and summative tests</td>
</tr>
<tr>
<td>Emotional intelligence and acquisition of English language oral communication skills</td>
<td>124 undergraduate students</td>
<td>quantitative methods involved Mayer-Salovey-Caruso Emotional Intelligence Test and the English Language Oral Communication Skills Test. Qualitative methods included interviews</td>
</tr>
</tbody>
</table>
Having analysed the articles presented in the table, a mean sample of a Ukrainian researcher’s class/group/participants was calculated. For this purpose the sum of all research participants (3722) was divided into the number of articles N=20. A common sample estimation for language teaching and learning research methods in 2020 turned out to be 186. Noteworthy, that the biggest number of participants was involved in responding to research questions. Choosing a group of participants to experience a particular approach or new teaching method or technique the mean number was approximately 67 students.

Another trend in language teaching and learning is international collaboration for conducting research and coauthoring. International switch to remote learning stimulated Ukrainian scientists in the field to establish more international connections. Sometimes it resulted in groups from Ukraine and abroad joining the experiment. Among the analysed articles collaborations with Poland, the USA, Spain, Turkey, China, Norway were noticed.

Discussion / Обговорення. The findings that 90% of the analysed articles had a mixed research
design correlate with the results of Hashemi M. (Hashemi M., 2012) who studied 273 articles published between 1995-2008 and proved that in journals such as *English for Specific Purposes, Language Learning, Language Teaching Research, Language Testing, The Modern Language Journal and TESOL Quarterly* 75% of the publications noted qualitative and quantitative approaches at different stages of the research.

Most researchers combine qualitative and quantitative approaches in order to gather a breadth of data and to validate their results (Lodico M., Spaulding D., & Voegtle K, 2010, p. 13). It is true also about foreign/second language teaching methodology. A mix of qualitative and quantitative approaches provides a more comprehensive understanding of the object of study (Riazi M., & Candlin C., 2014).

Most scientists continue using traditional qualitative and quantitative methods. One of the basic types of pedagogical method used is inductive reasoning. Inductive reasoning is most closely associated with qualitative research which is exploratory, descriptive, process-oriented (Nunan D., 1992, p. 4). Inductive methods include classroom observation. Using systematic observations teachers describe a pedagogical or methodological phenomenon that is being studied. Next stages include searches for patterns or themes in the observations and developing a generalization from the analysis of those themes (Lodico M., Spaulding D., & Voegtle K, 2010). For example, in the case where the scientist is considering the influence of art and ESP (English for Specific Purposes) integration on the development of professional language, creativity, intellectual engagement and collaboration skills of the students, he or she would use special exercises or activities and observe students’ motivation and attention changes, interaction with each other within a mini group etc. With remote distance learning teacher, classroom, student observations are more often held through audio and video recording, online in real-time in Google Meet, Telegram, Skype or Zoom.

Interviews and surveys are also inductive methods with questions being used. They would help to understand students’ likes or dislikes, their needs and weaknesses or strong points. They help to gather students’ and teacher’s perceptions, opinions, ideas, attitudes about an issue. More and more often surveys are held with the help of technology and can be anonymous. Language teachers like using Google forms or other polling software for their fixed questionnaires. Surveys allow teachers to ask more respondents the same questions. Interviews, however, deal with live questions and smaller sample size and they are more time-consuming but allow teachers to get more detailed information and ask clarifying questions in case of ambiguity. Sometimes researchers get valuable results using a hybrid combination of interviews and surveys.

Speaking about interviews, classifications of Mason J. (1994) and Mathers N., Fox N., and Hunn A. (1998) are used in the article. According to them, most of the interviews in current research in language teaching and learning in Ukraine can be defined as either structured or semi-structured interviews as they are planned in advance. Using a structured interview, a researcher can ask the same questions to many participants of the research. The chance to evaluate all the respondents equally and objectively is higher. Semi-structured interviews are more personalized as they allow a researcher to add spontaneous questions to different participants and potentially get more natural and honest answers revealing personal experiences and thoughts about a particular issue in teaching and learning a language. Considering the case of a learner’s perception of art elements used for teaching ESP, a scientist could use semi-structured interviews. After analysing the questions answered by all participants, a researcher could choose participants with the most negative and positive perceptions to investigate more in a free conversation and compare the answers. In this case, the individuals are chosen because they represent extreme differences. Noteworthy is the idea of Rosenkvist L. And Benic N. (2020) to send the interview back to the respondents so that they could read through and give their approval that the interviewer had perceived him/her correctly.

Another effective method for language teachers can be a focus group interview. With focus group interviews, the researcher collects data from multiple participants and observes and records the interactions and group dynamics that unfold (Lodico M., Spaulding D., & Voegtle K, 2010, p. 123). It can be effective in case the group had the same experience and tried a new approach or tool for language learning. A focus group interview is a good chance to ask different types of open-ended questions about an issue.

Observational checklists can help describe the performance and behaviour of students and teachers in the classroom setting. Teacher, classroom and student observation checklists can be distinguished (Andales J., 2020) and are used for language teaching and learning research. Teacher checklists help to evaluate ESP teacher’s performance, his or her approaches, check how the teacher interacts with the students. Classroom checklists will help ensure that a positive learning environment is provided for the students (Andales J., 2020). Student observation checklist refers to the academic, social and general conduct of students. A researcher needs to observe the lesson to answer the multiple
questions of the checklists aimed at a particular issue or object.

Except for observations, interviews and observational checklists, document analysis is one of the most common inductive methods used in the sphere. In language education research it is common to analyse student’s homework, textbooks, journal publications, programs, syllabi, university annual reports, laws of Ukraine «On education», regional strategies for action, Bologna action lines, The Standards and guidelines for quality assurance in the European Higher Education Area, Current National Qualifications Framework, Tuning Educational Structures in Ukraine, The International Standard Classification of Education (ISCED) and other international standards or domestic literature related to the problem of the research. For example, to investigate the language ability of university students in Ukraine, the Common European Framework of Reference for Languages are often studied. Depending on the speciality of the students, educational standards with a description of competencies should be investigated. Document analysis gives more information about the specialist domain, learners’ needs, institutional constraints, desired acquired skills and level course requirements etcetera. Thus, a scientist creates a list of documents to explore and analyse its content with attention to particular data.

Having used different inductive methods to investigate the influence of art on ESP learning, the researcher would conclude with a positive correlation between art elements used and professional language, creativity, intellectual engagement and collaboration skills development.

In the case of deductive reasoning, an educational researcher would first make a prediction based on previous theories or research in the sphere and review of related literature. A researcher in language teaching and learning should learn the theoretical background of Second Language Acquisition, Communicative language teaching, TESOL methodologies. The subject of teaching foreign languages and cultures is widely investigated by Ukrainian authors such as Berman I., Buchbinder V., Plakhotnik V. (1986), Vishnevsky O. (2010), Kvasova O. (2009), Nikolayeva S. (2008), Biych O., Borysko N., Boretska H. et al. (2013). Based on the fundamentals of teaching foreign languages and the topic of the research a scientist who decided to use deductive reasoning will, first of all, formulate a hypothesis. For example, a hypothesis that art integration can positively influence the development of professional language, creativity, intellectual engagement and collaboration skills of the students is made. Then a scientist will find evidence to either prove or disregard his or her hypothesis. For this purpose, in our case, it is necessary to compare studies with and without art elements, assessing a student’s performance in both cases.

Pedagogical investigations often involve quantitative research, expression of studying results in numbers. Statistical analysis of all test results, measures of personality, questionnaires is conducted. Processing of quantitative results in a wide range of Ukrainian experiments is performed using Bespalko’s learning outcome coefficient (Bespalko V., 1968). It is considered to be a traditional reliable way. In this case the level of language competence of the research participants is commonly measured by the formula K=A/N where K is learning outcomes coefficient, A is the number of points obtained for correct answers, and N is a maximal number of points assigned for correct answers (Bespalko V., 1968). The learning outcomes coefficient of 0.7 and higher is considered to be acceptable according to Cronbach’s alpha coefficient of reliability (Cronbach L., 1951).

Quantitative research is often classified as either nonexperimental or experimental. The later one can help determine cause and effect relationships. Non-experimental research uses numbers to describe pre existing groups or to determine whether a relationship exists between variables (Lodico M., Spaulding D., & Voegtle K, 2010, p. 24). A lot of the Ukrainian research in language teaching and learning is experimental as scientists prove a new approach, technique, methodology or set of special activities/tasks/exercises is better than a traditional approach or usual practice. Sometimes they use the control group which is not exposed to a new technique or approach and is taught using the old or conventional methods to distinguish a better pedagogic practice. In the case of art and ESP integration, student’s achievements can be the dependent variable and art elements used as a part of the creative approach can be an example of the independent variable. By student’s achievement, the improvement of professional language, creativity, intellectual engagement and collaboration skills can be meant. The participants of the experiment would be a group or groups of ESP students and their achievements would be numerically presented and analysed. Groups are tested before and after the experiment. In language teaching and learning context scientists often take established groups and not random participants. That’s why these experiments at universities are called quasi-experimental research.

In foreign/second language teaching methodology, there are formal quantitative group characteristics (such as group size, age, gender, duration of a group membership). Numerical data can also represent various attributes that vary called variables (Lodico M., Spaulding D., & Voegtle K, 2010; Sarre C., & Whyte S., 2016). Educational variables are academic achievement, study skills, self-regulation, motivation, teaching practices (Korb K., 2012). Variable characteristics can also include
special materials (authentic videos, Socratic questions, blogs etc.), students’ reasoning, problem-solving, teachers’ specific approaches (project-based learning, problem-based learning, task-based language learning, blended learning, content and language integrated learning), special tests, exams, a particular system of exercises. For example, at the National Technical University of Ukraine «Igor Sikorsky KPI» art elements used for teaching engineers ESP can be a variable or the type of art used.

Another common type of research in language teaching and learning is a **case study**. It combines different methods to study a particular case from different perspectives. To gather the information a researcher can interview individuals, use observations and documents analysis. He or she will spend much time exploring all the details of a case. An important feature of case study research is the examination of multiple variables (Lodico M., Spaulding D., & Voegtle K, 2010, p. 24).

As the results showed, teachers use a group of approximately 67 participants to test a new method or technique. Concerning the **sample size**, Griffe D. (2012) combined the insights found in Brown J. (2001) and Rea L. and Parker R. (1992) to present a common sample estimation for second language research methods. He considers a convenience sample of a researcher’s class which consists of 5-60 participants to be satisfactory for estimating the mean and standard deviation or making a weak claim for preliminary or pilot study but not a generalization to population. As for the language program of 61–100 participants, he states that 50% of the sample size is enough to make a generalisation to the language program. Concerning research projects (101–10,000 participants), a sample size of 400 can likely, in his opinion, produce generalizable results.

A researcher trying a new approach would usually choose a group of participants who experienced the approach. It is important to choose the correct **types of sampling** for the research. Miles M. and Huberman A. (1994) and Patton M. (1990) identified common strategies for purposeful sampling. Here are some of them especially useful for language learning and teaching:

- Typical case sampling (shows what is typical, it is a good idea for large projects);
- Extreme case sampling (extreme differences are chosen, for example, students with the lowest and highest scores, attention level etc.);
- Maximum variation sampling (the greatest diversity is included, for example, students with different background, language levels, diverse opinions etc.);
- Homogeneous sampling (students with the same features or experiences, for example, students with the same language level, motivation etc.);
- Purposeful random sampling (when several students are randomly chosen from a group where participants share particular experience or characteristic);
- Snowball sampling (when participants involve other participants, for example, university teachers ask other teachers of the same subject to complete a survey);
- Convenience sampling (the group is already formed, for example, a teacher uses his or her group of students which is the easiest but not always the best way to choose sampling).

**Conclusions / Висновки.** Both qualitative and quantitative methods are widely used in language teaching and learning research nowadays. Scientists continue using such methods of qualitative research as observations, interviews, surveys, checklists, document analysis. Quantitative methods involve statistical analysis during an experiment, measuring variables, finding frequencies, and hypothesis testing. Analysis of 20 articles published in the *Web of Science* indexed journal called *Advanced Education* in 2020 provided the opportunity to measure a mean sample size teachers used. Approximately 67 participants are usually involved to test a new method or technique. The number of the respondents in surveys where questions are asked to participants, however, in some cases turned out to be much higher (up to 1125 participants).

The results confirmed that the distinction between qualitative and quantitative research methods is not very important at the current time as both methods are created to identify things that bring better learning outcomes. Two major trends in teaching and learning language research were noticed. First, a mixed-method approach was defined as a dominant one in the sphere. Second, the increasing number of national and international collaborations occurred for the sake of finding better pedagogical practices.

The future potential of the study lies in understanding the influence of technology on research methods used in language teaching and learning in Ukraine and the identification of new research methods.
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