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INCORPORATION OF PEER INSTRUCTION FOR LANGUAGE LEARNING IN A DIGITAL FORMAT

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The article is devoted to an analysis of the possibilities for implementing the peer instruction method in the process of teaching Ukrainian as a foreign language in higher education, with a particular focus on the use of digital formats for out-of-class learning. Drawing on the experience of teaching the language component of a Ukrainian language course at the University of Cambridge, the author examines peer instruction as an effective tool for addressing two key challenges in language education: the limited number of contact hours and the significant heterogeneity of students' linguistic backgrounds.

The article systematises the main approaches to defining the concept of peer instruction in pedagogical literature, particularly in the works of E. Mazur and his followers, and clearly distinguishes between peer instruction and peer teaching. The theoretical framework of the analysis is grounded in L. Vygotsky's sociocultural theory, especially the concept of the Zone of Proximal Development, which allows peer instruction to be interpreted as a form of cooperative cognition that facilitates deeper acquisition of linguistic material through student–student interaction.

Special attention is given to the possibilities of adapting peer instruction to digital environments, including the use of videoconferencing, collaborative text work, audio projects, and other online tools. The author argues for the need to expand the traditional understanding of peer instruction, which is typically confined to in-class activities involving voting or response systems, and proposes treating digital, out-of-class forms of student collaboration as a fully-fledged variant of peer instruction.

The article also analyses potential didactic and ethical challenges associated with digital peer instruction, including the risk of incorrect acquisition of grammatical concepts in the absence of direct instructor supervision, as well as issues related to language choice during student interaction. A range of practical solutions is proposed to mitigate these risks, including clearly structured tasks, the integration of peer instruction with a just-in-time teaching approach, and the differentiation of learning activities based on students' prior linguistic experience.

Key words: peer instruction, peer learning, language teaching methodology, digital learning, assignment

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Introduction and Problem statement. Peer instruction has been highly effective for teaching various subjects in a higher education setting and it could greatly contribute to language teaching. In this assignment, I intend to explore the option of using peer instruction for Ukrainian language learning as part of the University of Cambridge's tripos paper. Even though peer instruction is usually regarded as a learning activity within a classroom setting, I argue that it can also be used for learning outside of the classroom using digital formats.

Peer instruction could be of great benefit to the specific course I teach. My primary objective at the University of Cambridge is to teach the language component of the SL9 paper (Introduction to the Language, Literature and Culture of Ukraine). The language component of this paper is limited to only 40 contact hours over the course of five months divided into three terms. The examination for this paper includes translation of an original

piece of Ukrainian literature, which requires a significant level of language proficiency. Considering the insignificant amount of direct teaching involved and the ambitious goal of the course, most of the learning must happen outside of the classroom, without the direct involvement of the language instructor. Peer instruction could enrich the learning experience in the classroom with learning activities outside of the classroom, thus compensating for the lack of teaching hours.

An additional obstacle in the teaching and learning processes is the fact that the course is attended by students with different levels of language proficiency. Some of the students are proficient in another Slavonic language, and thus are familiar with many grammatical concepts and vocabulary common across Slavonic languages. These students are grouped with students with no knowledge of Slavonic languages, which results in a major discrepancy in the progress of language acquisition. To address both issues (scarcity of teaching time and different proficiency levels), several techniques must be employed, including peer instruction.

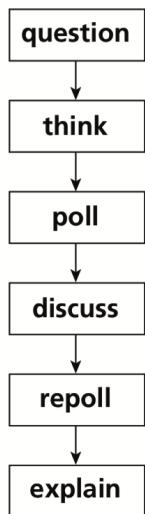
The aim of the article. In this publication, I intend to examine the usage of peer instruction for language acquisition in a digital format, and review the challenges and ethical issues associated with it. I also will outline the terminology of peer instruction and consider ways to resolve these challenges and overcome the ethical issues.

Review of recent research. Peer instruction is a student-centred teaching method in which the students instruct each other and help each other to understand the material before a more focused, in-depth consideration of the material can take place in the classroom. This is an interactive teaching method largely popularised by Harvard University Physics Professor Eric Mazur [7, 8], who defines 'peer instruction' as a teaching approach with a goal to 'exploit student interaction during lectures and focus students' attention on underlying concepts' [7 : 8]. Knight and Brame [4 : 1] provide a clearer definition that explains 'peer instruction' as a form of teaching which is 'generally defined as an opportunity for peers to discuss ideas or to share answers to questions in an in-class environment, where they also have opportunities for further interactions with their instructor.'

Peer instruction has been explored by researchers in education and educators from other disciplines, such as Knight and Brame [7], Crouch and Mazur [1 : 970–977], Nicol and Boyle [11 : 458–473] and others that provide different definitions. However, usually Peer Instruction is defined in a very specific narrow manner and with usage of specific tools:

'Instructor structures class time around conceptual multiple-choice questions (MCQs). Students answer individually, typically using audience-response-system clickers. The instructor reviews the percentage of responses for each possible answer. If an appropriate percentage of students answer incorrectly, the instructor asks the students to discuss their responses in small groups to arrive at a group answer and rationale. Students are generally asked to respond to the MCQ again after discussion.' [16 : 384]

Figure 1
Peer Instruction



Mazur E. *Turning a large lecture into a seminar: Using Peer Instruction to Promote Deep Understanding* [9].

It is worth noting that peer instruction is usually employed with a ‘just-in-time teaching’ approach, which is similar, although slightly different from a ‘flipped classroom.’ The difference between these two approaches is defined in a paper by Lasry, Dugdale, and Charles [6 : 34–37] cleverly entitled ‘*Just in Time to Flip Your Classroom*.’ In a flipped classroom students are expected to gather information on a given topic before they come to the classroom. Later, during the class, a teacher employs pedagogical expertise to help students make sense of the information they gathered before class. This usually involves assigning more complex and targeted assignments in class that resemble homework exercises.

Just-in-time teaching is a pedagogical strategy that resembles the ‘flipped classroom’ and involves students gathering materials on a topic before it is addressed in class. They then complete an online assignment and are asked to specify what parts of the assignment they find particularly difficult. A lecturer receives this feedback some time before the lecture and reviews it ‘just in time’ for class [6 : 34–37].

Just-in-time teaching requires a certain familiarity with a topic from the students before the topic is covered during the lesson. In a Ukrainian language learning setting this familiarity can arise in two ways: (a) the students familiarise themselves with a topic and come to the classroom prepared; (b) the students have some familiarity with the topic already if the linguistic concept covered is similar or identical to a concept in a different Slavonic language. It is also important to note that students with a familiarity with the topic based on their background in other languages might need to refresh their memory.

In the SL9 paper, ‘just-in-time’ teaching has additional benefits; it partially addresses the problem of ‘inequality’ arising from different levels of familiarity with Slavonic languages. That is to say, it does not matter as much if students have previous familiarity with a Slavonic language if all of the students have had a chance to familiarise themselves

with a particular topic, which will be covered in any given class. It also allows an instructor to understand if those students who have a more advantageous linguistic background actually experience any difficulties with learning similar concepts in a different language. My assumption based on experience of teaching Ukrainian at the University of Cambridge is that students with previous knowledge of a Slavonic language will superficially grasp grammar concepts which are similar in Ukrainian, Polish and/or Russian, but that they might experience more difficulties mastering the differences. It is commonly easier to learn new vocabulary and grammatical structures from scratch, rather than to train oneself not to interject knowledge of a known language into a language being learned.

Findings and discussion. Effectiveness. There is evidence to suggest that peer instruction has a positive effect on students' learning. Research supports the effectiveness of peer instruction over more traditional teaching methods, such as the traditional lecture [13]. Crouch and Mazur [1 : 970 – 977] conducted a ten year study of the impact of peer instruction on the learning of physics and were able to observe normalised learning gains that were usually twice as large with peer instruction as compared to those observed with traditional lectures. The case study researched the effect of peer instruction on two Harvard University introductory physics courses composed of students majoring in other fields. The peer instruction incorporated what Crouch and Mazur call 'ConcepTest.' A learning session was divided into a series of short presentations, each followed by a question (ConcepTest). Each question was developed to assess students' understanding of one of the ideas presented. Students were given a few minutes to formulate individual answers and report their answers to the instructor. After this, the students were given a few minutes to discuss their answers and then were allowed to alter their answer before being polled again. The instructor then closes the poll and explains the answer.

To measure students' performance, instructors use two tests, one focusing on students' knowledge of physics concepts and qualitative problem-solving skills, and the other focusing on the students' quantitative problem-solving skills. The tests are administered prior to instruction at the beginning of the year, and then after instruction at the end of the year. Crouch and Mazur then compared results in the years when peer instruction was used with the years when peer instruction was not used. The data showed that student performance on both tests improved during the years when peer instruction was implemented, as opposed to the years when it was not. Additionally, McConnel and colleagues [10 : 61 – 68] observed positive effects of peer instruction in geosciences. They determined that the average results of the students who participated in peer instruction pedagogy were higher than those for students who attended traditional lectures.

Finally, students generally have positive attitudes towards peer instruction. For instance, student feedback surveys in introductory courses in computer science [18], preparatory engineering [12], engineering mechanics [11 : 458 – 473], and veterinary physiology [3 : 168 – 173], indicated that students were satisfied with peer instruction and generally recommended that this approach be used in other and/or future courses in their feedback surveys. Moreover, Crouch and Mazur [1 : 970 – 977] noted that student reactions to PI were generally positive, with very few exceptions of students resistant to being taught in a nontraditional manner.

Overall, Crouch and Mazur's findings, as well as the findings of others cited in my research seem promising. Firstly, it is feasible that the students benefit from having the instructor cover the material they struggle with rather than review what they already

understand. Secondly, it makes sense that the students who critically engage in material discussion understand it in a better way. Implementation of peer instruction usage based solely on students' attitudes might not be justified, however, the cited effectiveness of this teaching methodology would be enough to justify its implementation in the SL9 paper.

Peer instruction for language learning parallels. Peer instruction for language learning parallels its use in other disciplines. Language learning, however, requires constant language practice and peer instruction should be combined with conversational practice with peers. Overall, peer instruction for language learners has been found to be effective. According to Rodriguez-Sabater [15 : 534] 'peer teaching instruction is effective because it increases the students' mastery of conceptual understanding and problem solving, and provides additional practice, especially when large classes may not offer enough personal attention to the students'. For instance, Rodriguez [14] found that in an L2 peer teaching programme, students have a sufficient number of opportunities to speak and practise the target language because they feel comfortable in a small class atmosphere, they also reinforce older material, and Rodriguez-Sabater's general impression was that the students have improved their Spanish speaking skills.

It is, however, important to distinguish between peer instruction developed by Eric Mazur and peer teaching, which was explored by Rodriguez. Peer teaching is an approach in which one student instructs another in 'material on which the first is an expert and the second is novice' [2 : 138]. While peer teaching incorporates a model in which there is a transfer of knowledge from one student to another, peer instruction is a model which involves an exchange of knowledge between two students. Peer instruction assumes a form of cooperation between the students, where two or more students look for a correct answer without knowing it. Interesting research by Smith et al [19 : 122 – 124] has been done in this regard. A statistical analysis of answers of students in an undergraduate genetics class showed that some of the students who did not answer the question correctly were able to arrive at the correct answer after a peer discussion, even if their discussion partners answered the question incorrectly. This demonstrates that even if students do not know the correct answer, they are able to question their position and through reflection arrive at the correct answer.

Peer instruction can be better understood through Vygotskian sociocultural theory. Central to Vygotsky's sociocultural theory is the assumption that higher mental activity in the individual derives from social life, e.g. dialogue between peers. Philip Scott [17] characterises Vygotskian analysis of the teacher's role as based on conceptualisation of teaching as 'assisting performance;' Scott also denotes that it is linked to individual student learning through the concept of 'Zone of Proximal Development.' Vygotsky defines the 'Zone of Proximal Development' as an area of potential learning gains for a student that can be accessed with additional support:

We discovered that one child could, in cooperation, solve problems designed for twelve-year olds, while the other could not go beyond problems intended for nine-year-olds. The discrepancy between a child's actual mental age and the level he reaches in solving problems with assistance indicates the zone of his proximal development; in our example, this zone is four for the first child and one for the second. Can we truly say that their mental development is the same? Experience has shown that the child with the larger zone of proximal development will do much better in school. [20 : 147]

In the case of peer instruction implementation in the SL9 paper, students with pre-

vious knowledge of a Slavonic language would have a much larger Zone of Proximal Development. While mastering a new language they will see a number of similarities between linguistic concepts and vocabulary in the new language and the language they speak. For the students with no previous knowledge of a Slavonic language, the Zone of Proximal Development would be limited. However, they would have the assistance of their peers. Therefore, the peers would be the ones guiding them into their Zone of Proximal Development.

Peer instruction in language learning can be used in two different ways: peer discussion of linguistic concepts and language practice. Discussions of grammar concepts could be conducted in an intermediary language, while the peer instruction for language practice would require usage of the target language.

Peer instruction could be especially effective for explaining grammar concepts, as some grammar concepts are similar across Slavonic languages and a number of students should be familiar with them and able to explain them to their peers. In addition to this, peer instruction does not uniformly improve students' course grades, however, it clearly improves students' use of reasoning and argumentation skills [5 : 645 – 654]. While reasoning and argumentation skills are important, the question remains of their importance in the context of the language component of the SL9 paper. Who is a better student - someone who can speak and translate from Ukrainian into English but is unable to explain linguistic concepts, or someone who is able to explain linguistic concepts while having more difficulties speaking and translating? Considering that the examination for the SL9 paper is conducted through translation of an original piece of literature from Ukrainian into English, I would prioritise a skill of translation over the skills of reasoning and argumentation.

Peer instruction in a digital format. In this publication, I would like to explore an alternative usage of peer learning. More specifically, I would like to explore peer instruction *outside of the classroom* with the assistance of technology that enables students to communicate with each other. Virtually, the scholarly literature in education does not examine the usage of peer instruction in the digital format. This could be explained by a very narrow definition of peer instruction, which is usually seen only as an *in class* activity.

As an example of 'digital format' for peer learning, I envision video conferencing (e.g. Zoom or Skype), remote collaboration on text documents (e.g. Google Docs), remote podcast recording (e.g. Audacity) and other forms of digital communication and collaboration students can use for peer instruction. Students would be given an assignment to complete outside of class during term time or between terms. For the assignment, students should be placed in pairs or larger groups by the instructor rather than by themselves, to ensure that the students with previous knowledge of Slavonic language are paired with the students with no or very limited knowledge of Slavonic languages. Considering that a large portion of the academic year at the University of Cambridge is spent outside of term time, the break time would be an appropriate time for peer instruction assignments, for which technology would be necessary as the students are normally far away from each other geographically.

Peer instruction is usually defined as an activity inside the classroom, which involves a vote on a certain question, further thinking about the question, peer discussion, a secondary vote, followed by the explanation of the correct answer by the instructor. While peer instruction inside the classroom could greatly benefit language learning, it only solves one problem - heterogeneity in proficiency levels amongst the students. To address

the second problem I am facing - scarcity of teaching time - peer instruction would have to be incorporated outside of the classroom. This raises a number of questions. Is it still 'peer instruction' if the teaching process occurs outside the classroom? Should students have a say regarding their willingness to participate in 'peer instruction'? How will the correct answers be disseminated to the students after their discussion?

I argue that the definition of peer instruction should be expanded to include learning outside of the classroom and learning processes that do not include a voting process, but still focus on discussions with peers. I would also categorise this practice as peer instruction, rather than peer teaching, as even though some of the students might have higher proficiency in the target language and more insight into the structure of the language and grammar concepts than others, essentially all of the students start learning the language from the beginning and there are no students who would be fluent in Ukrainian before joining the SL9 paper.

Peer instruction in a digital format for language learning is somewhat different from peer instruction in-class and presents a number of challenges. Firstly, if peer instruction happens without the direct involvement of the instructor of the course, there is a risk of a misunderstanding of the material. After the discussion of an answer to a question posed by the course instructor, the students will not have a chance to discuss the material with an instructor to ensure that their understanding of the material is accurate. Thus, the students could learn grammar the wrong way.

Secondly, students might not use the target language at all, which will result in low improvement rates in language acquisition. While there are some means for monitoring student activity, for example asking them to record their sessions or using appropriate software to periodically check students' progress (e.g. Perusall), however none of these control methods are realistic, as they would require a significant time commitment from the instructor. While communication in the target language could be of great benefit to language learners and peer instruction might promote that goal, it might be easier for the students to communicate in English and there would not be any way of controlling which language students use for communication. It is possible, however, to ensure that the target language is used in peer instruction exercises by devising assignments that would require students to use the target language (Ukrainian). For instance, if the students are assigned to record a podcast in Ukrainian, they would not be able to communicate in any other language. In contrast, if the students are asked to discuss a grammar concept, it might be more beneficial if they communicate in the language they are most proficient in to ensure understanding of the grammatical concept by all parties involved. Therefore, peer instruction requires the instructor to consider the desired language of communication between students when designing assignments.

These difficulties are challenging to overcome. Firstly, a short guide to the assignment and grammar concepts could be released to the students after the assignment has been completed. This will address any potential issues with understanding certain grammar concepts. In regard to a second issue, there is no way of ensuring that the students will communicate in the target language at all times. It might be beneficial for the students to communicate in English or other languages they are proficient in to be able to explain and comprehend grammar concepts. The students would be able to communicate in an intermediary language, however, they would have to use the target language for producing the assignment which will still affect their language proficiency.

Ethical issues. The question of introducing peer instruction in the SL9 paper raises some ethical issues. As a segment of the students who are proficient in one or more Slavonic languages would have to instruct a segment of the students who are not familiar with any Slavonic languages, some students might feel that their peers are more proficient than they are. Some of the students might be discouraged by the gap in knowledge.

At the same time, the students with higher proficiency might be dissatisfied with the fact that their language learning time will be spent on explaining grammar concepts they are somewhat familiar with, instead of mastering new material. More advanced students might prefer to focus on their own learning rather than helping their peers, which would widen the gap in knowledge.

Ethical issues may be addressed in a number of ways. The just-in-time teaching approach could be implemented. That is to say that the students will be assigned to familiarise themselves with the material in advance of the learning session and, therefore, the students who have less experience with Slavonic languages will be able to better prepare themselves for the peer instruction sessions in order to be able to match their peers with a higher level of experience in Slavonic languages. In addition to this, an optional homework could be assigned that would allow the students without previous knowledge of Slavonic languages to catch up with their peers. Optional assignments will also allow those students who already have some familiarity with Slavonic languages to choose not to do exercises that cover skills they already command.

The course instructor would have to explain to the more advanced students that working with their less proficient peers will help them cement their understanding of grammar concepts. The students that are more likely to have difficulty with learning Slavonic language would have to understand that their peers might have an advantage over them due to the fact that they have been learning Slavonic languages prior to Ukrainian.

Conclusions. Peer instruction in a digital format seems to be a good way to improve overall language proficiency and solve some of the problems associated with the SL9 paper. Peer instruction outside of the classroom, despite having its challenges, should be regarded as a form of peer instruction and can still be effective for language immersion, language acquisition, and for learning of new grammatical concepts. Peer instruction makes learning more comfortable for the students [14] and can be more effective than classical forms of instruction [1 : 970 – 977]. There are issues that are associated with peer instruction outside of the classroom, for instance, a risk of misunderstanding the material due to the absence of the instructor and the instructor's lack of control over which language the students speak. These challenges, however, can be addressed by clearly defined assignments. In addition to this, peer instruction in language learning in a digital format offers a number of benefits, such as additional time for effective learning, and an exchange of knowledge between the students that assists them in reaching their Zone of Proximal Development.

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ВИКОРИСТАННЯ ВЗАЄМОНАВЧАННЯ ДЛЯ ВИВЧЕННЯ МОВИ У ЦИФРОВОМУ ФОРМАТІ

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Стаття присвячена аналізу можливостей впровадження методу взаємонавчання (peer instruction) у процес вивчення української мови як іноземної в умовах вищої освіти, з особливим фокусом на використання цифрових форматів позааудиторної роботи. На матеріалі викладання мовного компонента курсу української мови Кембриджського університету автор розглядає взаємонавчання як ефективний інструмент подолання двох ключових викликів мовної освіти: обмеженої кількості контактних годин та значної неоднорідності мовної підготовки студентів.

У статті систематизовано основні підходи до визначення поняття peer instruction у педагогічній літературі, зокрема в працях Е. Мазура та його послідовників, а також проведено чітке розмежування між взаємонавчанням і парним навчанням (peer teaching). **Теоретичним підґрунтям аналізу слугує соціокультурна теорія Л. Виготського**, зокрема концепція зони найближчого розвитку, яка дозволяє інтерпретувати взаємонавчання як форму кооперативного пізнання, що сприяє глибшому засвоєнню мовного матеріалу через студентську взаємодію.

Окрему увагу приділено можливостям адаптації взаємонавчання до цифрового середовища, зокрема через використання відеоконференцій, спільної роботи з текстами, аудіопроектів та інших онлайн-інструментів. Автор аргументує необхідність розширення традиційного розуміння peer instruction, яке зазвичай обмежується аудиторною роботою з використанням систем голосування, і пропонує трактувати позааудиторні цифрові форми співпраці студентів як повноцінний різновид взаємонавчання.

У статті також проаналізовано потенційні дидактичні та етичні проблеми цифрового взаємонавчання, зокрема ризик некоректного засвоєння граматичних концептів без безпосереднього контролю викладача, а також питання мовного вибору під час спілкування студентів. Запропоновано низку практичних рішень для мінімізації цих ризиків, зокрема чітку структуру завдань, поєднання взаємонавчання з підходом **just-in-time teaching** та **диференціацію навчальних активностей** залежно від попереяднього мовного досвіду студентів.

Ключові слова: взаємовикладання, взаємонавчання, методика викладання мови, цифрове навчання, домашнє завдання.

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