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ACTIVE LEARNING: USING CROSSWORD AND WORDSEARCH PUZZLES FOR TEACHING VOCABULARY TO STUDENTS OF THE MEDICAL FACULTY

Vocabulary teaching is an essential part of the professionally-oriented foreign language teaching and learning process. The teaching community always strives to enhance the teaching tools and introduce new ones to make the learning process more active and learner-centered. The potential pedagogical value and effectiveness of crossword and wordsearch puzzles were explored in many studies. This work considers crossword and wordsearch puzzles as pedagogically useful resources for teaching vocabulary to students majoring in "General Medicine". This study was carried out at the Medical Faculty of the al-Farabi Kazakh National University in groups GM 22-05 and GM 22-06. Fifteen international students enrolled in a foreign language course participated in this study. During the whole academic semester, students were given crossword puzzles as an additional teaching tool for learning and testing the knowledge of the new vocabulary and wordsearch puzzles for practicing vocabulary as fillers or integrated learning activity. The survey results showed that students had a positive experience and were eager to learn and practice vocabulary via solving crossword and wordsearch puzzles. The findings revealed that crosswords can be beneficial and helpful for (a) teaching and learning new vocabulary; (b) testing students' knowledge of the studied vocabulary; (c) teaching spelling; (d) enhancing students' analytical and cognitive skills as well as (e) relieving stress and giving students a feeling of accomplishment. While wordsearch puzzles are useful for teaching and learning new vocabulary, particularly their spelling, in a playful manner. Both tools can be used by English language teachers as a creative learning material for teaching vocabulary in an interesting, engaging and fun way. In the practical part of the research, pedagogical suggestions for the creation and use of crossword and wordsearch puzzles are provided.

Key words: foreign language teaching, English for professional purposes, teaching vocabulary, active learning, gamification, crossword puzzles, wordsearch puzzles.

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Белсенді оқыту: медицина факультетінің студенттеріне лексиканы үйрету үшін сөзжұмбақтар мен сөз іздеу ойжұмбақтарын қолдану

Лексиканы меңгеру кәсіби бағытталған шет тілін оқытудың ажырамас бөлігі болып табылады. Оқытушылар қауымдастығы оқу процесін белсенді және оқушыларға бағытталған ету үшін қашан да оқу құралдарын жетілдіруге және жаңартулар енгізуге тырысады. Сөзжұмбақтар мен сөз іздеу ойжұмбақтардың потенциалды педагогикалық құндылығы мен тиімділігі көптеген зерттеулерде қарастырылған. Аталмыш зерттеу жұмысында сөзжұмбақтар мен сөз іздеу ойжұмбақтары «Жалпы медицина» мамандығының студенттеріне лексиканы оқытуға арналған педагогикалық пайдалы ресурстар ретінде қарастырылады. Бұл зерттеу әл-Фараби атындағы Қазақ ұлттық университетінің медицина факультетінде GM 22-05 және GM 22-06 топтарында жүргізілді. Зерттеуге шет тілі курсында оқитын он бес шетелдік студент қатысты. Бір оқу семестр бойы студенттерге жаңа сөздерді үйренуге және білімін тексеруге арналған қосымша оқу құралы ретінде сөзжұмбақтар, сондай-ақ сөздік қорын арттыру немесе интеграцияланған оқу тапсырмасы ретінде сөз іздеу ойжұмбақтары берілді. Сауалнама нәтижелері студенттердің оң тәжірибе алғанын және сөзжұмбақтар мен сөз іздеу ойжұмбақтарын шешу арқылы сөздік қорын үйренуге және жаттығуға деген талабын көрсетті. Нәтижелер сөзжұмбақтар (а) жаңа лексиканы оқыту және жаттау үшін; (б) студенттердің үйренген лексика бойынша білімдерін тексеру; (в) сөздердің дұрыс жазылуын оқыту; (г) оқушылардың аналитикалық және танымдық дағдыларын дамыту, сондай-ақ (д) стрессті жеңілдету және студенттерде жетістік сезімін тудыру үшін пайдалы болуы мүмкін екенін көрсетті. Ал сөз іздеу ойжұмбақтары жаңа лексиканы, әсіресе оның дұрыс жазылуын ойын түрінде үйрету үшін пайдалы екендігін көрсетті. Екі құралды да ағылшын тілі

мұғалімдері лексиканы қызықты, тартымды және көңілді түрде үйрену үшін шығармашылық оқу материалы ретінде пайдалана алады. Зерттеудің практикалық бөлімінде сөзжұмбақтар мен сөз іздеу ойжұмбақтарды құрастыру және пайдалану бойынша педагогикалық ұсыныстар берілген.

Түйін сөздер: шет тілдерін оқыту, кәсіби мақсаттағы ағылшын тілі, лексиканы үйрету, белсенді оқыту, геймификация, сөзжұмбақтар, сөз іздеу ойжұмбақтары.

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Активное обучение: использование кроссвордов и головоломок по поиску слов для обучения лексике студентов медицинского факультета

Обучение лексике является неотъемлемой частью процесса преподавания и изучения профессионально-ориентированного иностранного языка. Педагогическое сообщество постоянно стремится совершенствовать имеющиеся и внедрять новые средства обучения, чтобы сделать процесс обучения более активным и студентоцентрированным. Потенциальная педагогическая ценность и эффективность кроссвордов и головоломок по поиску слов изучалась во многих исследованиях. В данной работе рассматриваются кроссворды и головоломки по поиску слов как педагогически полезные ресурсы для обучения лексике студентов, обучающихся по специальности «Общая медицина». Данное исследование проводилось на медицинском факультете Казахского национального университета им. аль-Фараби в группах GM 22-05 и GM 22-06. В исследовании приняли участие 15 иностранных студентов, обучающихся на курсе иностранного языка. В течение всего учебного семестра студенты получали кроссворды в качестве дополнительного учебного задания для изучения и проверки знаний новой лексики и головоломки по поиску слов для отработки лексики в качестве заполнителей или интегрированного учебного задания. Результаты опроса показали, что студенты получили положительный опыт и с большим желанием изучали и отрабатывали лексику, разгадывая кроссворды и головоломки по поиску слов. Результаты исследования показали, что кроссворды могут быть полезны для (а) обучения и изучения новой лексики; (б) проверки знаний студентов по изученной лексике; (в) обучения правописанию; (г) развития аналитических и когнитивных способностей студентов, а также (д) снятия стресса и появления чувства достижения цели. В то время как головоломки по поиску слов полезны для обучения и изучения новой лексики, особенно ее написания, в игровой форме. Оба инструмента могут быть использованы преподавателями английского языка в качестве творческого учебного материала для обучения лексике в интересной, увлекательной и веселой форме. В практической части исследования даны педагогические предложения по созданию и использованию кроссвордов и словарных головоломок.

Ключевые слова: обучение иностранным языкам, английский язык для профессиональных целей, обучение лексике, активное обучение, геймификация, кроссворды, головоломки по поиску слов.

Introduction

In today's realities of a globalized world, there is no need to additionally prove the relevance and importance of professional communication skills in a foreign language. Golikova L.V. defines professional or occupational communication as an interaction process which implies the exchange of action, information and experience in order to achieve a specific goal or solve a specific problem (Golikova, 2005: 203). According to Serebryanikova M.A., students' readiness for professional communication in a foreign language consists of such elements as motivational, audiolingual, monological, communicative, grammatical and lexical components (Serebryanikova, 2010: 48). Baildinova K.Zh. accentu-ates the importance of having a regular students' feedback mechanism as a part of creating a student-centered teaching and learning environment based on international experience (Baildinova, 2010: 32). This paper focuses on the lexical component and investigates the effectiveness and usefulness of the crossword and wordsearch puzzles as an additional tool for teaching and learning vocabulary from the medical students' point of view based on their perceptions and attitudes rather than focusing on the students' learning results.

The relevance of the chosen research topic can be justified by the fact that the introduction of crossword and wordsearch puzzles into the teaching and learning process became a research object for many scientists and methodologists

around the world such as Kaynak, S., Ergün, S., & Karadaş, A. from the Faculty of Health Sciences at Balikesir University, Turkey (2023); A. Maheshwari, B. Sadariya, HN. Javia and D. Sharma from the Department of Biochemistry at the Gujarat Adani Institute of Medical Sciences in India (2021); Mshayisa V.V. from the Department of Food Science and Technology at Cape Peninsula University of Technology in Bellville, South Africa (2020); Chesy L., Susilawati E. and Bunau E. from Tanjungpura University in Indonesia (2018); Orawiwatnakul W. from the Language Institute at Bangkok University in Thailand (2013); Deborah A. Raines from Christine E. Lynn College of Nursing of the Florida Atlantic University in the USA (2010); Franklin, S., Peat, M. and Lewis, A. from the School of Biological Sciences at the University of Sydney in Australia (2003); Jay P. Kunz from Mississippi State University in USA (2002).

The object of the research is the process of teaching vocabulary to medical students. **The subject of the research** is the use of crossword and wordsearch puzzles as a pedagogical tool for teaching vocabulary to medical students**. The goal of the research** is to suggest an algorithm for self-generating crossword and wordsearch puzzles and analyze students' feedback on the use of the above-mentioned active learning tools. To achieve this goal, the following **research objectives** were defined:

to determine the degree of study of the problem of using crossword and wordsearch puzzles in the methodology of foreign language education;

to create and suggest an algorithm for self-generating crossword and wordsearch puzzles;

to test the suggested algorithms and analyze students' feedback.

Theoretical significance of this study lies in the summarization of the international teaching experience on the use of active learning tools such as crossword and wordsearch puzzles. **The practical significance** of the study lies in the fact that the results of this research can help young and experienced teachers of foreign languages to diversify their teaching tools and make the teaching and learning process more creative and engaging.

Materials and methods

Having analyzed all benefits mentioned in the review of the available literature and challenges associated with the use of crossword and wordsearch puzzles, this research paper is aimed at the development of an algorithm for self-generating crossword

and wordsearch puzzles and investigating the students' feedback on the use of the above-mentioned active learning tools.

The learning process for international students within the course "Foreign language" at the medical faculty of Al-Farabi Kazakh National University is based on the textbook "English for Careers: Medicine 1". Printed copies of crossword puzzle self-generated via free Crossword Labs website (https://crosswordlabs.com/) and wordsearch puzzles self-generated via Free Online Wordsearch Maker website (https://easywordsearchmaker.com/create) were provided to students during offline classes. In order to promote collaborative and active learning students were asked to work in pairs or groups. When doing a group work, the teacher performs the supervising function: answering questions, regulating disputes, assisting individual students or groups (Dildabekova, 2010: 72). The choice of a partner was carried out by students independently based on personal preferences and relationships between students. We chose the crossword labs website because: a) it is free; b) it has friendly interface; c) it is possible to download or print a ready-made crossword puzzle in pdf format or export it to Microsoft Word; d) if correction is necessary, it is possible to go back and make changes.

The survey was conducted at the end of the spring semester on voluntary and anonymous basis and administered via Google Forms platform. Students were informed that the survey was being conducted to study the experience of students about the use of crossword puzzles, wordsearch games and Kahoot platform in their learning process and their answers would not affect their final grade for the course. Fifteen international students (particularly from Iran, Afghanistan, Nigeria and Indonesia) enrolled in a foreign language course participated in this study, 12 of whom are males and the rest 3 are females. In order to achieve the purpose of this study, a questionnaire consisting of 13 questions was developed. Questions from 1 to 7 were focused on the use of crossword and wordsearch puzzles. Respondents were supposed to answer questions based on their perceptions and attitudes to solving crosswords via five-point Likert-scale survey: "Strongly Agree", "Agree", "Disagree", "Strongly Disagree", "Neither". Likert-type scales developed by Rensis Likert in 1930s are one of the most popular scales used by researchers around the world for measuring people's opinions and attitudes in clinical and health psychology (Hartley, 2013: 84). The present paper is an attempt to investigate medical

students' feedback on the use of creative teaching tools such as crossword and wordsearch puzzles as a potential additional activity for teaching and learning new vocabulary in the creative English language classroom.

Literature review

Traditional teaching and learning methods are mainly teacher-centered and a large part of information and rules have to be memorized (Topîrceanu, 2017: 42). Golikova L.V. emphasizes the importance of active learning where the learning process is not just about passive listening and automatic remembering but about providing students with the teaching activities where they can learn how to apply their knowledge and solve tasks (Golikova, 2005: 45). Smakova K.M. contends the paradigm shift in modern education leaded to the transition from "knowledge-based education" with "teacher-centered classrooms" to "learner-centeredness" with "instructor-facilitated methodology" (Smakova, 2021: 46-47). This paradigm shift was inevitable due to the changes in our everyday life such as the increasing globalization of world trade or cultural globalization causing the changes in people's needs and expectations. Since the communication across cultures became predestined, the essence of teaching and learning English as global language changed its primary focus. The learner and the development of the learner's communication skills became the main objective of foreign language education.

Prevailing role of students' motivation and students' satisfaction as a result of a gamified learning environment in the teaching-learning context is highly accentuated by Alsadoon E., Alkhawajah A. and Suhaim A.B. (Alsadoon, Alkhawajah, Suhaim, 2022: 1) According to the authors, gamification introduces several factors such as "...challenge, control, collaboration, and competition, which makes it a promising approach to making positive changes in students' learning" (Alsadoon, Alkhawajah, Suhaim, 2022: 1) Abdullah A. reminds us that learning is more communal even though it takes place on an individual level and "the process of learning is most effective when people engage with one another" (Abdullah, 2022: 16). According to Aldalur I. and Perez A., gamification is "… a strategic attempt that can turn learning into an immersive activity" (Aldalur, Perez, 2023: 2) Within the constructivist learning theory, thinking, discovery, and reflection are the pre-requisites for student's effec-

tive acquisition of knowledge rather than memorization and recall of isolated facts (Raines, 2010; 86). Solving crossword and wordsearch puzzles as a part of gamified active learning is one of the possibilities of how to engage students in meaningful, interesting and exciting way. Emotional engagement of students in the learning process can be shown via "…students' enjoyment, enthusiasm, interests, sense of belongings, and eagerness to participate in the class" (Hanaysha, Shriedeh, In'airat, 2023: 3). Niyazova A. attributes creative teaching and generation of positive emotions to the main principles of modern intensive teaching (Niyazova, 2023: 144).

Orawiwatnakul W. defines crossword puzzle as a word game where the player is supposed to guess the right words based on the given clues and fill blank squares with the appropriate letters (Orawiwatnakul, 2013: 417). According to the results of the survey conducted by Franklin, S., Peat, M. and Lewis, A. among teachers who used crosswords as an extra material with first year biology students, the staff comments emphasized that with the help of crosswords students received the opportunity to rehearse the studied material not just by simply answering the questions but in a fun and engaging way (Franklin, Peat, Lewis, 2003: 83). Maheshwari, A., Sadariya, B., Javia, H. N., and Sharma, D. reported that crosswords are helpful in starting small group discussions, in recalling and promoting critical thinking based on their research focused on crossword puzzles as an interesting teaching tool to facilitate teaching learning process in undergraduate students of biochemistry (Maheshwari, Sadariya, Javia, Sharma, 2021: 12). In his research V.V. Mshayisa reported strong positive ratings among students about the use of crossword puzzles for understanding and remembering vital terms or concepts in food science and technology (Mshayisa, 2020: 54). In addition, crossword puzzles allowed students to experience positive peer learning and "…enhancement of cognitive/mental skills as well as their attitude toward learning" (Mshayisa, 2020: 55). Raines D. considers crossword puzzles as "a fun and active learning opportunity to facilitate comprehension of the words and terms specific to women's health, obstetric and neonatal nursing practice" (Raines, 2007: 29). A recent study on the potential of crossword puzzles was dedicated to the effect of crossword puzzle activity used in distance education on nursing students' problem-solving and clinical decision-making skills where the authors from Turkey reported that "… crossword puzzle activity used in distance educa-

tion developed the students' problem-solving and clinical decision-making skills" (Kaynak, Ergün, Karadaş, 2023).

Kunz J.P. perceives wordsearch puzzles as "a fun way to add interest and variety to the regular assignments and activities in a foreign language class" (Kunz, 2002: 148). The author reminds us of the tedious process that teachers used to undergo in creating word search puzzles manually before the invention of special websites that can create these puzzles in minutes (Kun, 2002: 148). Naturally, all teaching tools have their strengths and weaknesses. Based on their research findings, Chesy L., Susilawati E., Bunau, E. found out that the main advantages of wordsearch puzzles are the presence of motivation among students for vocabulary learning, improvement of the memorization process and creation of a cheerful atmosphere in the classroom (Chesy, Susilawati, Bunau, 2018: 9). However, they also warned us that this activity can be time-consuming and requires strict timing, as well as careful monitoring due to the possibility of students' cheating (Chesy, Susilawati, Bunau, 2018: 9).

Results and discussion

Deborah A. Raines suggests two models for using crosswords in the classroom: providing students with puzzles compiled by the teacher, and providing students with a crossword, the content of which is developed by the students themselves, working individually and in small groups (Raines, 2010: 89). Within our research we have followed the first scenario and provided students with the readymade crossword and wordsearch puzzles. As illustrated in picture 1, both crossword and wordsearch contain basic medical terminology from the studied units "Dealing with Medication" and "Presenting complaints" which included a subtopic "Technical terms for body parts". In her research, K.E. Alibekova explains medical language as "a special subsystem of the national language intended for anatomical nominations, naming of diseases, symptoms and treatment methods, as well as pharmacological nominations, i.e. reflecting the sphere of medicine and professional activity of a medical worker" (Alibekova, 2006: 17).
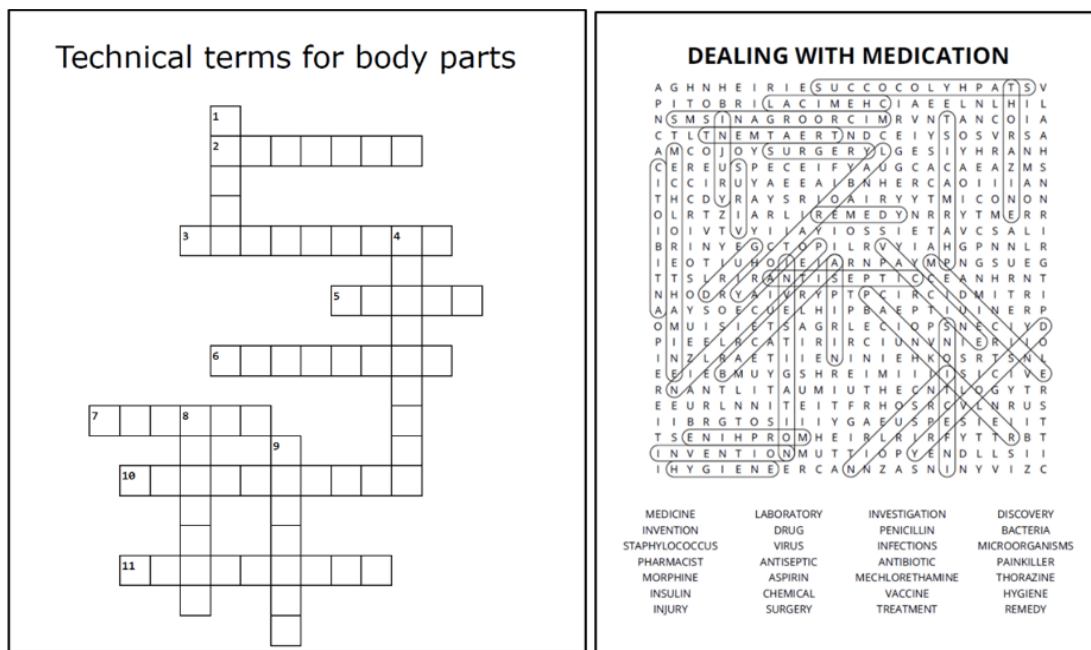

Picture 1 – Samples of wordsearch and crossword puzzles

The following clues were included into the crossword "Technical terms for body parts" used withing the study of the Unit 1: Presenting complaints. The answers are provided in brackets.
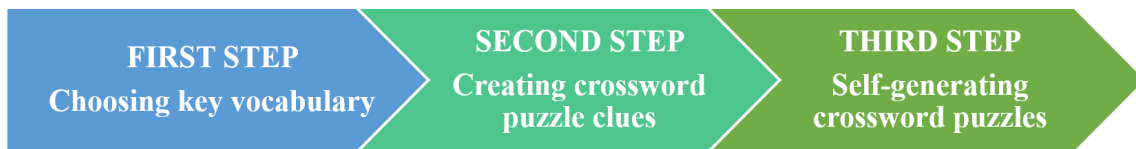
Across
2. The lower part of a person's or animal's body, containing the stomach, bowels, and other organs, or the end of an insect's body *[abdomen]*

3. The tube in the body that takes food from the mouth to the stomach *[esophagus]*

5. The large bone at the front of the lower leg *[tibia]*

6. The technical word for the collarbone (= the bone between the shoulder and neck) *[clavicle]*

7. The bones between the hand and the lower part of the arm that form the wrist *[carpus]*

10. A long tube through which food travels while it is being digested after leaving the stomach *[intestines]*

11. The heel bone *[calcaneus]*

Down

1. A bone forming part of the ankle joint *[talus]*

4. The small, round part in the middle of the belly that is left after the umbilical cord (= the long tube of flesh joining the baby to its mother) has been cut at birth *[umbilicus]*

8. The bone at the front of the knee joint *[patella]*

9. The technical word for the breastbone *[sternum]*

Constructing crossword puzzles. It is obvious that it is time-consuming or even impossible to find out readymade crossword or wordsearch puzzles consisting the necessary professionally-oriented vocabulary and perfectly fitting the textbook content. That is why self-generating crosswords is the key to success for teachers. The following three-stage algorithm was used in this study when self-generating crossword puzzles for the course. The first step "Choosing key vocabulary": the topical vocabulary is gathered from the course textbook's content. The second step "Creating crossword puzzle clues": Most trusted free online dictionaries such as Cambridge and Oxford dictionaries are used as the main source of definitions for creating crossword puzzle clues or questions. The third step "Self-generating crossword puzzles": Free online crossword puzzle maker "Crossword Labs" website (https://cross-wordlabs.com/) is used for generating the final product.

Picture 2 – Three-stage algorithm for self-generating crossword puzzles

Constructing wordsearch puzzles. The creation process of a wordsearch puzzle is more simplified. The algorithm for the creation of a wordsearch consists of only two stages. On the first stage, when collecting the key vocabulary, we can use the same key words from the crossword puzzle. There is no need for constructing clues, that's why we move on to the generating of a wordsearch puzzle via Free Online Wordsearch Maker by inserting the necessary words into the box on the website. The first step: choosing key or topical vocabulary from the course textbook's content and the second step: generating a wordsearch puzzle using Free Online Wordsearch Maker website (https://easywordsearchmaker.com/create).

**Picture 3 –** Two stage algorithm for self-generating a wordsearch puzzle

As a result of following above-described algorithms for self-generating crossword and wordsearch puzzles we were able to construct specific puzzles that contained vocabulary units relevant for our course. All language units have been carefully selected depending on the content of the units being studied.

Survey results: according to the Picture 4, most of the answers were positive, which may serve as a reason to believe that the students of the

focus groups had a positive experience with solving crossword and wordsearch puzzles. Members of both groups believe that solving crossword puzzles may help to relieve stress and give a feeling of accomplishment when finishing the task successfully: 67% strongly agree and 33% agree. Regarding wordsearch puzzles, we can observe the similar pattern, all students agree that it was fun to engage

in this kind of game and beneficial for learning new profession-related vocabulary and the right spelling of the words. Above-listed positive results concur with the findings reported by V.V. Mshayisa who studied the influence of crossword puzzles on the vocabulary learning experience of students majoring in food science and technology (Mshayisa, 2020: 55).
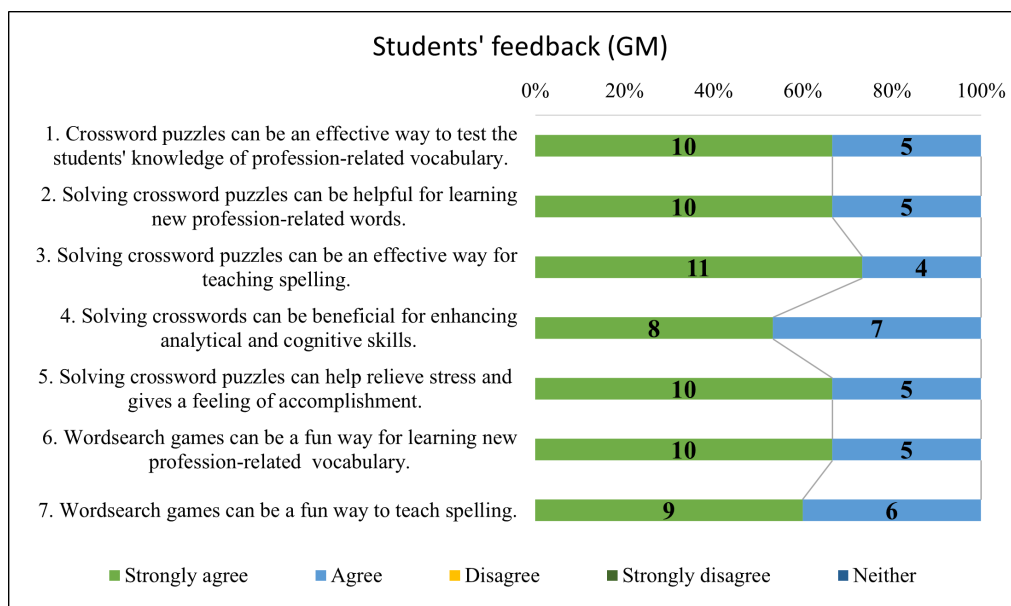
Picture 4 – Results of the survey conducted among students majoring in "General Medicine" on the use of crossword and wordsearch puzzles.

Conclusion

Having analyzed articles and experience of international teachers, we came to the conclusion that crossword and wordsearch puzzles can be constructed or self-generated by teachers and integrated into the English language teaching and learning environment, particularly for enhancing the students' vocabulary acquisition efficiency. One of the main advantages of self-generating crosswords is that the process itself is free for the teacher. The teacher is the one to decide the size and complexity of the crossword or what kind of words to include into the crossword. On the other side, it is a time-consuming process because the teacher is supposed to create questions or gather definitions from dictionaries and put the text into the crossword labs website manually. The construction of a wordsearch puzzle is more simplified than the construction of a crossword puzzle because the latter requires the teacher to find the

clues or definitions adequate to the level of students' language proficiency. Thus, the use of crosswords requires careful preparation and planning from the teacher. Still, using the final product is very rewarding taking into account the atmosphere it brings to the classroom. It is also worth noting that both tools can be helpful in building friendly students relations due to the presence of cooperation when students work in pairs during solving crosswords or wordsearch puzzles.

Based on our research findings, we can assume that **crossword puzzles can be used as:**

- a warm-up activity at the beginning of the lesson in order to rehearse or check the knowledge of the vocabulary from previous classes;

- a wrap-up activity for lesson closure to test the understanding of the concepts or fix what students have learned during the class period;

- a vocabulary test at the end of the unit, during midterm control or other types of control.

Wordsearch puzzles can be used as:

- a warm-up activity creating the competition spirit at the beginning of the lesson;

- a wrap-up activity to revise and consolidate the new vocabulary as well as cheer up tired students at the end of the lesson.

However, this study has several limitations which may impact the interpretation of the research results. Firstly, we need to take into account the small size of the study sample. Secondly, we have considered only two groups of students from the same university, which may limit the generalizability of our findings. Thirdly, the academic performance rates were not taken into account when assessing the effectiveness of crossword puzzles as a teaching tool. Our research was only focused on the students' perceptions and attitudes toward crosswords. Future studies aimed at identifying the influence of crosswords on students' learning outcomes with a larger number of participants and variability of samples would make the research more reliable. In order to be fully confident in the potential of crossword puzzles as a resource for teaching vocabulary to medical students, more research is needed. Based on the conclusions made by researchers and teachers using crossword puzzles as a teaching tool in different sciences and disciplines as well as the experience of medical students who took part in this research, it can be stated that despite above-mentioned limitations, we can assume that in order to make the teaching and learning process more interesting and enjoyable, teachers can introduce crossword puzzles into the classroom for teaching occupational vocabulary taking into account the above-listed provisions and recommendations.

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