

Use of Comics in Enhancing Speaking Interaction Skills of Prospective Engineers in ESP Classroom

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Abstract—The article is devoted to the problem of teaching English for specific purposes (ESP) of engineering students. The research reports on the effectiveness of using comics as an innovative tool for enhancing English speaking interaction of engineering students in ESP classroom. Particular attention is paid to the use of online platforms for creating comics, as a means of improving professional English speaking skills in the context of engineering activities. It is noted that online resources for creating comics are accessible and easy to use, which makes it possible to integrate this method into the educational process. The advantages and disadvantages of using comics as a tool for enhancing speaking skills in the educational process are revealed. It is defined that comics allow the students to work with technical terms and the realities of professional communication by creating context based on engineering situations. Due to the visual component of comics, the students can more effectively understand the context of communication and build their speech strategies according to real-life situations. The study defines that using comics may require more preparation time and is not always suitable for every topic or type of learning activity. The research shows that although comics have a certain template, the tasks based on comics while learning English allow developing coherent foreign language speech, enriching students' vocabulary, analyzing the material read and identifying the main points. The use of comics enables engineering students not only to work actively with the text but also to develop their creative abilities by creating their own comics using modern Internet resources and mobile technologies. The findings suggest that working with comics not only increases the motivation of engineering students, but also provides interactive and dynamic learning that improves their English language skills.

Keywords—Comics, engineering students, English for specific purposes, English language skills, English speaking interaction.

I. INTRODUCTION

In today's globalized and integrated professional communications environment, engineers need not only to possess specialized technical knowledge but also demonstrate a high level of English communicative competence, particularly in the context of their professional activities. In this regard, learning English for professional communication is becoming an extremely important aspect of training future engineers.

One of the main problems in teaching English for professional communication is the low motivation of students to learn a foreign language, caused by the use of traditional methods that can seem monotonous and ineffective. In addition, the available educational materials often do not correspond to the real-life professional activities that students will face in their future careers.

The education system is currently undergoing significant changes due to certain prerequisites. One of the prerequisites is the generation of young people who are growing up in the digital era and who cannot imagine their lives without daily use of a mobile device. Their perception and assimilation of information require modern teaching methods.

We share the opinion of Dmitrenko and others [1] that the active use of language learning strategies plays a key role in helping students manage their learning, develop their speaking abilities, and boost their confidence and motivation to learn a foreign language. By applying these strategies, students become more autonomous and take greater responsibility for their learning process. As they use more strategies, they feel more confident, motivated, and independent in their language skills. In the ESP (English for Specific Purposes) classroom, the teacher's main task is to choose suitable methods and strategies that align with the students' needs and to guide them in effectively using these strategies to improve their

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speaking skills and foster greater autonomy in learning. The students are no longer interested in working with large amounts of information but rather learn much better short phrases or texts that contain images. The use of comics is best suited to provide engaging and lively lessons, where students have the opportunity to demonstrate their communication skills.

The use of comics in teaching English and other disciplines is becoming an effective tool for educators, so many meaningful scientific studies have been implemented in the educational process recently. Gudoshnyk [2], [3] considers comics as a phenomenon of mass culture and explores its popularization in Ukraine through the publishing market, specialized magazines and online reviews, and various thematic events dedicated to comics culture. Kolesnyk [4] considers comics as one of the types of visual art, which, depending on the genre of the comic, can be attributed to both literature and cinema. The author describes the influence of calligraphy on the poetics of comics (the skill of conveying the written word with the help of various fonts), choreography and theatre (facial expressions, gestures, various poses have become an expressive means of comics), cinema (borrowing the principle of storyboarding, plan and perspective).

Kosmatska [5] considers comics as a phenomenon of mass culture and draws attention to the completeness of the lines: the use of incomplete sentences, short emotionally expressive statements, addresses and exclamations. Dmitrenko and others [6] consider creolized texts, to which they also include comics, as a means of shaping adolescents' value orientations. Lavrenova [7] focuses on the possibilities of using comics in the educational process, namely, using comics to activate vocabulary, improving communication skills, organizing individual and group work. Semenova [8] believes that involving comics in the educational process affects the improvement of foreign language communicative competence and promotes the use of student-centered, competency-based, communicative, and sociocultural approaches in the process of learning foreign languages.

Apostolou and Linardatos [9] studied the effectiveness of digital comics in computer science classes to show how the use of comics contributes to successful learning. Aleixo, Matkin and Kilby [10] surveyed the educators about their experiences using comics in the educational process and analyzed their responses. The use of comics was considered only as a means of entertainment and had no educational value; the usefulness of using comics in education was to help students who needed additional support; the use of comics had not yet reached its pedagogical potential.

The formation of speaking interaction skills is a complex process, as it requires doing certain exercises to master dialogue unities, producing micro-dialogues and composing dialogues for several lines. Accordingly, this process will differ for each student, depending on their age, attention span and motivation for learning English.

Nikolaeva, Bihych, Borysko and Boretska [11] believe that the formation of speaking interaction skills is impossible without the development of students' speech, learning, intellectual, organisational and compensatory skills, which involves the ability to start a conversation, maintain it and end it while using the appropriate intonation, gestures, facial expressions, and the ability to switch from one topic of conversation to another. It also requires the ability to predict the interlocutor's possible remark, systematise and evaluate the information received during the conversation and respond accordingly; the ability to use various information and communication technologies and supports; the ability to respond quickly to the interlocutor's phrases and provide feedback; the ability to find ways to solve difficult situations that arise during the dialogue.

The development of speaking interaction skills becomes effective if students have a high level of speaking skills (the ability to use lexical, phonetic and grammatical material while listening and speaking), phonetic skills (the ability to perceive and recognise sounds, intonations and produce their speech in accordance with phonetic norms); lexical skills (the ability to recognise lexical units and use them in their speech); grammatical skills (the ability to recognise grammatical forms and structures and use them).

The term "comics" has many definitions, but they all state that it is an image that tells a story with dialogues and descriptions of events. The sequence of these images creates a narrative. The texts in these images are often placed in phylacteries – clouds or bubbles that convey the speech or thoughts of the comic characters [12].

Chykalova [13] reveals the advantages of using comics in the educational process. First of all, it is the capacity of information and the dynamism of its display that makes it possible to quickly and easily learn the necessary material through visual channels of information perception. The students can work with comics gradually, after viewing 2-3 panels of the comics, they can stop, discuss what they have read, determine whether all the lexical units and grammatical structures are clear. The students can try to predict what might happen next to the main characters. The scientist states that using this approach will encourage the students to improve their English proficiency.

Another advantage is the brevity and accuracy of the language in comics, which allows the use of simple words, phrases and short structures that are easy to read and remember. Working on a comic book will keep students active, as they will be constantly engaged in performing certain tasks aimed at developing reading, speaking, writing and listening skills. Comics can be an effective tool for organizing students' independent work, allowing them to create tasks that include working with the text and combining graphic and textual material.

The research aim is to substantiate the effectiveness of using comics in enhancing the speaking interaction skills of prospective engineers in the ESP classroom.

II. MATERIALS AND METHODS

Future engineers can develop their skills and abilities in foreign language communication while working with comics. If they work on creating a comic book, they have the opportunity to use various Internet services and use mobile technologies (smartphones, tablets, computers, mobile applications).

During our research, we used the website <https://www.storyboardthat.com/storyboard-creator>. It has a very wide range of options that can be used to create comics. The site menu provides options to select a background, customize the main characters, and choose bubbles in various shapes. When working with text, it is possible to adjust the font, size, and colour. For the main character images, the site offers opportunities for experimentation and creativity. The main characters can be people who lived in different eras and belong to different professions, monsters or mythical heroes, animals, shadows. Heroes can be placed in different poses – sitting, standing, talking; their appearance can be changed: from the colour of their hair and skin to the colour of their clothes; they can express different emotions.

There are a few limitations to using this site. Without registration, only three free panels are available for comic creation, which also restricts the selection of characters and backgrounds. Saving the created comic is not possible, with the only option being to take screenshots and save them to a device. Registering on the site unlocks a broader range of options for comic creation.

In the study, professionally oriented English vocabulary was taught to the prospective engineers through comics created using the aforementioned website. The first step involves selecting or creating a comic on a specific topic relevant to the students' learning objectives. Based on this comic, tasks are developed in which the students are required to fill in gaps with target words or expressions. Prior to completing the tasks, the students are provided with hints, such as the part of speech the word might belong to or the first letters of the word to be inserted.

Comics were also used to teach grammar in ESP classroom. The students were asked to complete tasks based on the comics, where they needed to use a verb in a certain tense form, or use a particular grammatical structure in a sentence. In these tasks, students were required to infer the meaning of the structure from the context.

The development of speaking interaction skills for prospective engineers was facilitated through dialogue-based activities. Initially, students were given tasks involving images of comics with missing dialogue from the main characters. They were asked to guess the possible content of the conversation, the setting, and the characters involved. After a general discussion, the same images were distributed, but this time with some dialogue lines already included. The students' task was to complete

the dialogue by adding the missing lines. To promote collaboration, the students were divided into groups, allowing them to work together to fill in the gaps with appropriate phrases. Finally, all possible dialogue versions were reviewed, and the most suitable one was selected.

Another variation of the speaking interaction exercise involves the task of establishing the correct sequence of cues. This activity was conducted in a distance learning format using Jamboard, where the students edited the cues provided by the educator. In a traditional classroom, students could be divided into teams to arrange the lines in the correct order, adhering to grammatical and punctuation rules. A time limit could also be set to increase the challenge. Once completed, the answers are reviewed and compared with the original comic strip. The final stage involves the students composing their own dialogue, providing an opportunity to demonstrate acquired vocabulary, grammar, and speaking skills.

The research was conducted with 28 second-year students majoring in Engineering at Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University. The training took place over one term in the 2023/2024 academic year and was carried out under standard conditions without any special selection of students, in two subgroups of 14 students each. The students were informed about the purpose and objectives of the experimental training. During the experimental phase, all students in the experimental groups used the same educational materials as those in the control group. The method of working with comics was applied during the training of the experimental group. All students were assessed using the same criteria, and speaking interaction tests were administered both at the beginning and at the end of the experimental training.

The students' speaking interaction skills were assessed according to the following criteria:

- 1) relevance of the dialogues created by students to the speech situation and the communicative task;
- 2) coherence of the presentation;
- 3) length of the speech;
- 4) reactivity;
- 5) language proficiency;
- 6) initiative in speaking interaction.

The results of students' speaking interaction based on comics were assessed using a learning coefficient, adapted to align with the specific requirements of speaking interaction skill development.

The students' answers were assessed on a scale that includes six criteria for evaluating the quality of the testee's dialogic speech. Each criterion was rated on a scale from 0 to 3:

- "0" – the criterion is absent;
- "1" – the criterion shows very weak indications;
- "2" – the criterion shows certain indications;
- "3" – the criterion demonstrates sufficient indications.

The learning coefficient is calculated using the formula $q = n : m$, where q is the learning coefficient, n is the score achieved by the test taker, and m is the maximum score for the task. To ensure more accurate results, the coefficient values should be expressed in hundredths.

The grade for creating and presenting a task in comics is given by comparing the learning coefficient with the grading scale.

TABLE 1 CORRELATION BETWEEN THE LEARNING COEFFICIENT AND THE LEVELS OF SPEAKING INTERACTION SKILLS DEVELOPMENT

<i>Levels of speaking interaction skills development</i>	<i>The learning coefficient</i>
High	0,85 - 1
Intermediate	0,75 - 0,84
Satisfactory	0,65 - 0,74
Low	0,64 and less

Although speaking interaction typically involves the interaction of two communication partners, each student was assessed individually in this study. The goal of experimental learning is to foster the personal development of each student, enabling them to engage in conversations not only with a desk partner or friends but also in various real-life situations. In real life, each student will need to quickly adapt to different contexts, initiate and maintain conversations, and respond appropriately in formal settings. Experimental learning focuses on changing communication partners, varying role tasks, considering students' interests and preferences, and providing feedback to improve the speaking interaction skills of both interlocutors after their interaction has concluded.

The learning coefficient during the pre-experimental phase was 0.68 for the control group and 0.66 for the experimental group. According to the correlation between the learning coefficient and the rating scale (see Table 1), these values correspond to the "satisfactory" level, indicating an insufficient development of speech and dialogic speech skills in both groups.

III. RESULTS AND DISCUSSION

At the beginning of our study, the students in both the control and experimental groups showed approximately the similar level of speaking interaction skills development. At the stage of the post-experimental assessment, after the experimental group students had worked with the comic-based methodology we proposed, a post-experiment evaluation was conducted. The results of this assessment showed that the learning coefficient in the control group increased to 0.71, while in the experimental group, it increased to 0.85. These results correspond to the levels of speaking interaction skills development categorized as "satisfactory" and "high," respectively.

After the experiment, the dialogues created by the students of the experimental group based on comics aligned well with the communicative situation. The students presented their thoughts accurately, logically, and coherently, with an increased length of the speech. The dialogues became more meaningful, and the responses met the general requirements. The interlocutors responded much more quickly to each other's remarks, using learned set phrases and active vocabulary. Furthermore, the initiative in the conversations also increased. Therefore, the dynamics of the individual criteria before and after the experimental assessment for both the control and experimental groups are presented in Table 2. The dynamics of achievement are marked with two symbols: "+" (indicating an improvement in the quality of the criterion) and "-" (indicating a decline in the quality of the criterion).

TABLE 2 RESULTS OF THE INDICATORS BY CRITERIA OF SPEAKING INTERACTION SKILLS DEVELOPMENT

<i>Indicators by criteria</i>	<i>Control group</i>			<i>Experimental group</i>		
	<i>before</i>	<i>after</i>	<i>dynamics</i>	<i>before</i>	<i>after</i>	<i>dynamics</i>
Relevance of the dialogues created by students to the speech situation and the communicative task	3,25	3,33	+0,08	3,41	3,75	+0,33
Coherence of the presentation	3,00	3,08	+0,08	3,00	3,58	+0,58
Length of the speech	3,08	3,25	+0,17	2,83	3,41	+0,58
Reactivity	2,50	2,66	+0,16	2,25	3,33	+1,08
Language proficiency	2,33	2,41	+0,08	2,25	3,33	+1,08
Initiative in speaking interaction	2,33	2,41	+0,08	2,08	3,00	+0,92

In the control group, no significant improvements in speaking interaction were observed based on the relevant indicators of individual criteria. As shown in Table 2, only minor changes occurred in the control group, with the most notable increases being in the volume of expression, which rose by 0.17, and reactivity, which increased by 0.16. The remaining indicator coefficients improved by 0.08.

It is evident that significant positive changes occurred in the experimental group. The greatest increase was observed in the success coefficient for reactivity and language proficiency in producing dialogues, with a rise of 1.08, followed by initiative in carrying out dialogic speech, which increased by 0.92. Additionally, the coefficients for the volume of expression and the logical coherence of thought presentation improved by 0.58,

while the coefficient for the alignment of the students' created dialogues with the communicative situation increased by 0.33.

TABLE 3 AVERAGE INDICATORS OF THE PRE- AND POST-EXPERIMENTAL ASSESSMENTS

Total number of students	Indicators by criteria						Indicators by all criteria	
	Relevance of the dialogues created by students to the speech situation and the communicative task	Coherence of the presentation	Length of the speech	Reactivity	Language proficiency	Initiative in speaking interaction	Total score	Learning coefficient
Experimental group								
Pre-experimental assessment								
14	3,41	3	2,83	2,25	2,25	2,08	15,83	0,66
Control group								
Pre-experimental assessment								
14	3,25	3	3,08	2,5	2,33	2,33	16,5	0,68
Experimental group								
Post-experimental assessment								
14	3,75	3,58	3,41	3,33	3,33	3	20,41	0,85
Control group								
Post-experimental assessment								
14	3,33	3,08	3,25	2,66	2,41	2,41	17,16	0,71
Maximum score								
14	4	4	4	4	4	4	24	1

The comparative analysis of the results before and after the experiment led to the conclusion of positive outcomes from the conducted research. The effectiveness of the proposed method for enhancing speaking interaction skills based on comics was confirmed (the average learning coefficient after the experimental training is 0.71 for the control group, compared to 0.68 before, and 0.85 for the experimental group, compared to 0.66 before). The obtained results provide a strong basis to assert that the dynamics of speaking interaction development, measured by individual criteria, is more positive and significant in the experimental group than in the control group.

Our research confirmed the idea presented by Lavrenova [7], Semenova [8], Apostolou and Linardatos [9] that the use of comics in the ESP classroom provides

an opportunity to develop speaking interaction skills, expand students' vocabulary, improve their phonetic, lexical, and grammatical abilities, to analyze reading material, highlight key points, demonstrate creativity, and foster innovative and critical thinking. Additionally, comics enhance motivation for learning. Due to visual and textual components, comics facilitate better language material acquisition and the development of professional communication skills.

The results of the conducted research confirmed the effectiveness of using comics as a method for teaching professionally oriented English to engineering students.

IV. CONCLUSION

The relevance of using comics in teaching English for specific purposes to prospective engineers is underscored by several factors. First, with the advancement of digital technologies, modern students possess a high level of visual literacy, enabling them to effectively engage with comics as an educational tool. Second, comics integrate lexical, grammatical, and communicative aspects of language, which are essential for developing professional language competence. They provide a valuable platform for learning specialized terminology and exploring speech situations relevant to the professional activities of engineers. Introducing comics into the educational process can serve as an effective strategy to enhance student motivation, foster interactive and contextually enriched learning, and support the development of the language and communication skills crucial for professional success.

The study revealed that there are potential challenges when working with comics. Comics can be difficult to understand if they feature a complex plot, multiple main characters, or if they include difficult vocabulary, intricate grammatical structures, or use of allegories and metaphors. When it comes to creating comics, a significant limitation may be the insufficient level of knowledge among both educators and students. This gap can hinder the effective integration of comics into the learning process.

The research shows that although comics have a certain pattern, performing tasks based on comics while learning English allows developing coherent foreign language dialogic speech, expanding students' vocabulary, analyzing the material read, and highlighting the main points. Using comics allows engineering students not only to actively work with the text, but also to develop their creative abilities by creating their comics using modern Internet resources and mobile technologies. The findings suggest that working with comics not only increases the motivation of engineering students but also provides interactive and dynamic learning, which improves their speaking, reading, writing, and listening skills in English.

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