Action Research: Boosting Students' Analyzing and Generalizing Skills

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Abstract

The following article is devoted to the problem of developing students' higher-order thinking skills, such as analysis and generalization via project-based learning (PBL) implemented in the English classroom. The problem was revealed several years ago during everyday practice while teaching productive skills, both speaking and writing, to high-school learners (Grades 10 and 11). Action Research, as one of the most effective ways to investigate teaching practice, was used to answer the research questions and find effective techniques to develop students' analyzing and generalizing skills.

First, it was essential to define the place and role of analysis and generalization in PBL approach, as well as identify the most effective ways of organizing project work with senior students in the English classroom. As a result, we were able to conclude that during this research the students could not only increase the level of their language proficiency but also develop critical thinking and creative skills in the process of doing projects and discussing the research results in collaboration with peers.

We hope, the results of this research will be useful both for English language teachers and wider pedagogical community. If teachers of other subjects are interested in this study, it is possible to jointly conduct an extended Lesson Study on the problem of developing analysis and generalization skills through project-based activities in different subjects.

Key words: analysis, generalization, project-based learning, effective problem solving, language skills

Introduction

Many educators in modern schools still tend to perceive critical thinking just as analytical thinking. However, critical thinking incorporates both analytical thinking and creative thinking. Regular students' observation has revealed their problems with the ability to break down information into parts, analyze the parts in a logical, step-by-step manner, formulate new ideas and generate innovative solutions. The PBL approach is an effective way to develop 21st-century capabilities by promoting critical thinking as well as problem-solving, interpersonal communication, cooperation, leadership and teamwork, innovation, and creativity (Häkkinen et al., 2017).

According to Salybekova et al. (2021), in our country, as well as worldwide, there has long been a need to develop students' scientific research skills from an early stage of schooling. Thus, the goals of project-based learning are to gain knowledge in the program and curriculum scopes, master the acquired knowledge for comprehensive self-development, master communication skills in working with various groups in solving cognitive and practical problems, and develop system thinking.

Poonpon (2017) claims that PBL can be defined as an instructional approach that contextualizes learning by presenting learners with problems to solve or products to develop. In this case PBL is different from traditional instruction because it emphasizes learning through student-centered, interdisciplinary, and integrated activities in real world situations.

Referring to Fried-Booth (1997) and Simpson (2011), PBL can be characterized as an approach that focuses on content learning rather than on specific language patterns. Being truly student-centered, it encourages collaboration among students, leads to constructing a bridge between English in class and English in real life contexts, naturally integrating language skills and skills to analyze and generalize information from multiple sources.

More importantly, PBL is oriented both at process and product (Stoller, 1997). In the PBL classroom students receive an opportunity to use a whole range of 21st century skills, such as problem-solving, creativity and teamwork, at different work stages, so the work and language skills are developed simultaneously (Brunetti et al., 2003). Since PBL is potentially motivating, empowering and challenging to language learners, it usually results in building learners' confidence, self-esteem, and autonomy as well as improving students' language skills, content learning, and cognitive abilities (Fried-Booth, 1997).

It is also essential to define the analysis and generalization skills. Analytical skill is the ability to deconstruct information into smaller categories in order to draw conclusions (Conklin, 2011). Generalization is the ability to use skills that a student has previously learnt in new and different environments (Haring, 1988). Both skills are interrelated and interdependent because the level of their development plays a vital role in PBL.

The aim of the research was to identify the ways of boosting students' analyzing and generalizing skills at different stages of project activity through the use of different sources of information.

To achieve this aim, we sought answers to the following research questions:

1) How should learners be taught to be able to analyze and generalize information?
2) What role does this process play in project work?
3) Which techniques can be used to develop analyzing and generalizing skills effectively?

Methodology

As for research methods, we decided to choose a qualitative research approach. The study was conducted in a real English classroom setting, so Action Research, as one of the qualitative research methods, was used. According to Corey (2014), teachers, as practitioners, who actually teach children every day, undertake this method to solve their practical problems, thereby improving their practice and self-reflection skills. In the process of Action Research teachers not only draw upon all the experience available to them, but also set the hypothesis, accumulate evidence and try to generalize as carefully as possible in order that their research results will contribute to the solution of similar problems in other educational environments.

The two cycles of Action Research were conducted over the course of two academic years and involved a group of high-school students from the 10th and 11th grades respectively. At the diagnostic stage the preliminary analysis of students' summative assessment results in English was conducted, which revealed great difficulties in the development of such higher-order skills as analysis, synthesis and generalization. In order to successfully complete summative tasks on productive skills for students in Grades 10-12, it is not enough just to speak or write in English in full, well-constructed sentences without serious lexical and grammatical errors. One of the evaluation criteria, in both writing and speaking, is the ability to build arguments properly, relying not only on one's own opinion, but also on information taken from reliable sources. Students' inability to support their written and oral

responses with facts, statistics, and research findings indicated a limited depth of understanding.

In the process of our research, it was also decided to study the protocols of psychological and pedagogical diagnostics of students in the studied class. It was important to acquire information about learners' leading channels of perception, their types of temperament and leading styles of activity as well. Those results were supposed to help optimize the learning process, taking into account the individual pace of work and differentiation of resources and activities.

Further we will try to describe the next stages of this Action Research, including action, observation and reflection.

Results

At the next stage PBL was implemented as a series of short-term integrated projects in the English classroom in order to encourage the students to use the English skills they had learned in class as a medium to present content and exchange information in the field of different school subjects depending on the problem discussed. Also, at the lesson planning stage, it was necessary to decide which form of interaction to choose for more effective progress towards solving research questions. It was decided to organize work on a mini project in small groups of 4 or 5 people. As it turned out this very number of students allowed to complete a project in a shorter period of time.

In addition, since students with different temperaments, different types of perception and thinking styles studied in the same class, it was decided to divide the students into groups in random order, so that to involve the maximum number of students in active learning of lesson materials and group interaction to solve a common problem. This approach also proved to be effective, because students' individual features acted as triggers to make them actively participate in the group generalization process. So, for example, Student C, who has an analytical type of thinking, immediately paid attention to diagrams and percentages; student B, with the leading symbolic type of thinking, to text samples (essays and articles), and student A, the owner of a figurative type of thinking, immediately assumed the role of an expert analyst, helping the rest of the team process and transform information.

Each cycle of concurrent lessons was based on the introspection of the previous lessons. Observation of the first lesson in each cycle made it possible to determine the level of development of active and passive topical vocabulary and the depth of understanding of problems and concepts. It became clear that students did not have enough information on the topic for more detailed answers and to operate confidently with facts, statistics and research findings. The students found it difficult to give more detailed answers with clearly formulated arguments, because they often did not know what to say.

Therefore, after a thorough analysis of the observed results it was decided to offer students apart from texts a variety of additional sources of information (infographics, tables, posters, articles and schemes), after studying which they could have enough data to confidently use the information in their responses. In order to give them an opportunity to familiarize themselves with the resources more effectively, different graphic organizers, such as tables, mind maps, word clouds and synthesis matrices, were used to boost more detailed investigation of the information.

Reflecting on the results of the Action Research, we can conclude that almost all students actively participated in the discussion and presentation of their group projects. Students were

able to choose what and how to study and felt free to make their own decisions on the final product of their research (a presentation, a table, an oral description).

Some students who faced challenges with analysis and generalization, received timely individual scaffolding, both from the teacher and from stronger classmates. It can be said that all 100% of the students completed their projects, but it was still difficult for some students to speak without support. Also, the effectiveness of the planned work on the mini project can be judged by the lively discussions that arose at the stage of providing feedback from the teams to each other, during which the students managed to reach a deeper understanding of the concepts being studied. Students were able to raise various issues that may arise in real life.

Conclusion/ Discussion

To conclude, it should be pointed out that high-school students' research skills, such as analysis and generalization, have proven to be effectively developed via PBL in the English classroom. As a result of the given Action Research, we have come to the following outcomes:

1. Using different graphic organizers, such as tables, line graphs and synthesis matrices, students have learnt how to categorize themes and patterns, integrate various sources focusing on one idea in one paragraph.

2. Using multiple examples, varying stimuli and instructions, teaching across different settings, providing students with problem situations, even regrouping have proven to be effective while boosting learners' generalizing skills.

3. Analysis and synthesis of the information helps learners to show how they relate the ideas, how and why they are valid, how these ideas can be logically added to the conversation. Generalization is observed when learners are encouraged to apply the skills we teach them in untrained but similar conditions.

It's essential to point out that the investigation of the effectiveness of the chosen techniques is still ongoing, but the first analysis of the results suggests that teachers need to implement the ideas of the research to develop their students' critical as well as creative skills using PBL techniques, such as teamwork, role-play and problem-solving in their classroom.

It is hoped that the results of this research will be useful for English language teachers and the broader pedagogical community. If teachers of other subjects are interested in this study, it is possible to jointly conduct an extended Lesson Study on the problem of developing skills of analysis and generalization of information through project-based activities in different subjects.

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