THE ROLE OF PROBLEM-BASED LEARNING IN DEVELOPING PROFESSIONAL ENGLISH COMMUNICATION SKILLS OF CYBER SECURITY STUDENTS

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Abstract

This article examines the role of problem-based learning in developing professional English communication skills of cyber security students. In modern cyber security education, students need English not only for reading technical materials, but also for discussing risks, explaining incidents, presenting solutions, and communicating with international specialists. Problem-based learning creates realistic classroom situations in which students analyze professional problems, work collaboratively, make decisions, and use English for meaningful communication. The article discusses how problem-based learning can improve professional vocabulary, speaking fluency, critical thinking, teamwork, and confidence in English for Specific Purposes classes. Using a descriptive-analytical approach, the study explores the pedagogical value of problem-based learning for cyber security students and suggests a practical lesson model for English instructors. The article concludes that problem-based learning is an effective method for connecting language learning with real professional challenges in cyber security education.

Key words: *problem-based learning; professional English; cyber security education; ESP; communicative competence; speaking skills; critical thinking; higher education*

Introduction

English has become one of the most important tools for professional communication in cyber security. Many technical documents, cyber security reports, international standards, software instructions, research articles, and online professional discussions are written in English. Future cyber security specialists may need to explain cyber threats, describe vulnerabilities, discuss possible solutions, write incident reports, and communicate with international partners.

For this reason, English classes for cyber security students should be connected with their future professional needs. Traditional grammar exercises and general conversation topics are not always enough to prepare students for workplace communication. Students should learn how to use English in realistic situations where they need to solve problems, exchange information, justify opinions, and present recommendations.

Problem-based learning is one of the methods that can make English lessons more practical and meaningful. In problem-based learning, students are given a real or realistic problem and are asked to analyze it, find possible solutions, and explain their decisions. This method encourages students to use English as a tool for communication, not only as a subject to study.

In cyber security education, problem-based tasks may include situations such as a phishing attack in a company, a weak password policy, a data breach, malware infection, unauthorized access, or poor employee awareness of security rules. These problems are closely related to students' future careers and can motivate them to use professional English actively.

The aim of this article is to analyze the role of problem-based learning in developing professional English communication skills of cyber security students. The article focuses on vocabulary development, speaking fluency, critical thinking, teamwork, and practical classroom application in English for Specific Purposes lessons.

Literature Review

Problem-based learning has been widely used in higher education because it encourages active learning, independent thinking, and practical problem-solving. Unlike teacher-centered instruction, where students mainly receive information, problem-based learning requires students to participate actively in the learning process. They identify the problem, discuss possible causes, search for information, compare solutions, and present their final decision.

Barrows (1986), one of the key scholars connected with problem-based learning, describes this approach as a method that develops problem-solving ability and self-directed learning. In this approach, students do not simply memorize information; they learn how to apply knowledge in practical situations. This feature makes problem-based learning especially useful for professional education.

English for Specific Purposes also supports the use of professional and field-related tasks. Dudley-Evans and St John (1998) state that ESP courses should be designed according to learners' specific academic and professional needs. For cyber security students, this means that English lessons should include the language of risks, threats, incidents, security recommendations, and technical explanations.

Communicative language teaching is another important theoretical basis for problem-based learning. Hymes (1972) introduced the idea of communicative competence, which means the ability to use language appropriately in real communicative situations. Problem-based learning gives students such situations because they must use English to understand the problem, negotiate meaning, express opinions, and reach a decision.

Richards (2006) explains that communicative activities should give learners opportunities to use language for meaningful purposes. Problem-based learning naturally creates such opportunities. Students speak not only to answer the teacher's questions, but also to solve professional problems and communicate their ideas to others.

Nunan (2004) also emphasizes the importance of task-based learning, where language is learned through completing meaningful tasks. Problem-based learning is closely related to this idea because students complete tasks that require real communication. In cyber security English classes, such tasks can include analyzing a security incident, preparing a recommendation, or presenting a prevention plan.

Problem-based learning is also useful for developing critical thinking. Cyber security problems are often complex and require careful analysis, evaluation of evidence, ethical judgment, and quick decision-making. When students discuss these problems in English, they develop both language skills and professional thinking skills at the same time.

Methodology

This study uses a descriptive-analytical research design. It is based on the analysis of teaching approaches related to problem-based learning, English for Specific Purposes, communicative language teaching, and cyber security education. The article also considers practical classroom application for English instructors working with cyber security students.

The proposed problem-based teaching model includes four main stages:

1. Problem introduction stage

At this stage, the teacher introduces the professional problem and prepares students for discussion. The teacher may give a short scenario, explain the background, present key vocabulary, and ask warm-up questions. For example, students may receive a situation in which employees of a company receive suspicious emails asking them to enter their login credentials.

2. Group analysis stage

At this stage, students work in pairs or groups to analyze the problem. They identify what happened, who was affected, what mistakes were made, and what risks may appear. Students use English to exchange ideas and organize their thoughts. The teacher monitors the discussion and provides language support when necessary.

3. Solution development stage

At this stage, students develop possible solutions. They discuss what the company should do immediately, how the attack could be prevented, and what recommendations should be given to employees. Students are encouraged to use professional vocabulary and useful phrases such as: The main cause of the problem was..., The company should..., One possible solution is..., This risk can be reduced by..., and In our opinion, the best recommendation is....

4. Presentation and feedback stage

At this stage, each group presents its analysis and recommendations. The teacher gives feedback on language use, pronunciation, clarity, professional vocabulary, and logical organization. Students also reflect on what they learned from the problem and how the same situation could be handled in real professional practice. The following types of problem-based tasks can be used in English classes for cyber security students:

Problem type	Classroom task	Language focus
Phishing attack	Analyze a fake email and prepare advice for employees	Warning language, recommendations, risk vocabulary
Data breach	Explain what happened and write a short incident report	Past tense, reporting verbs, technical vocabulary
Weak passwords	Discuss reasons for unauthorized access and suggest rules	Modal verbs, obligation, prevention phrases
Malware infection	Identify the source of infection and create response steps	Sequencing words, cause and effect language
Social engineering	Role-play a phone-based manipulation attempt	Question forms, polite refusal, clarification
Incident response	Present an emergency response plan to management	Presentation language, solution vocabulary, formal tone

Results

The analysis shows that problem-based learning can support the development of professional English communication skills of cyber security students in several important ways.

First, problem-based learning helps students use professional vocabulary in meaningful contexts. Instead of memorizing isolated words, students use terms such as phishing, malware, vulnerability, authentication, encryption, firewall, risk assessment, and incident response while discussing realistic cyber security problems. This makes vocabulary learning more practical and memorable.

Second, problem-based learning improves speaking fluency. Students have a clear reason to speak because they need to understand the problem, share opinions, ask questions, and agree on a solution. This creates more natural communication than simple question-and-answer exercises.

Third, problem-based learning develops critical thinking. Students need to identify the main problem, analyze possible causes, evaluate different solutions, and justify their recommendations. These activities require deeper thinking and help students become more active learners.

Fourth, problem-based learning supports teamwork. Cyber security specialists often work in teams, especially during incident response. Group problem-solving activities help students practise cooperation, turn-taking, negotiation, and decision-making in English.

Fifth, problem-based learning increases motivation. Students are more interested in tasks that are connected with their future profession. When they see that English can help them solve real cyber security problems, they understand the practical value of language learning.

Sixth, problem-based learning prepares students for workplace communication. Future specialists may need to explain technical problems to managers, clients, colleagues, or ordinary users. Problem-based tasks give students practice in adapting their explanation to different audiences.

Discussion

The use of problem-based learning in English classes is especially relevant for cyber security students because it connects language learning with professional practice. Students do not study English only as a general subject; they use it as a tool for solving problems, discussing risks, and explaining solutions.

One of the main advantages of problem-based learning is that it creates a realistic communicative need. In many traditional speaking activities, students speak because the teacher asks them to speak. In problem-based tasks, students speak because they need to understand the situation, solve the problem, and present their decision. This makes communication more purposeful and closer to real professional interaction.

The teacher’s role is very important in this method. The teacher should select problems that match students’ language level and professional background. If the task is too difficult, students may focus only on understanding the technical content and may not communicate actively in English. If the task is too simple, it may not develop critical thinking. Therefore, problems should be realistic, accessible, and challenging at the same time.

Language support is also necessary. Before students start solving the problem, the teacher should provide useful vocabulary, expressions, and sentence patterns. For example, students may need phrases for giving opinions, agreeing and disagreeing, explaining causes, suggesting solutions, and presenting recommendations. Such support helps students speak more confidently and professionally.

Problem-based learning also allows the integration of several language skills in one lesson. Students may read a problem scenario, discuss it in groups, listen to other groups’ presentations, and write a short recommendation or report. This reflects real workplace communication more closely than isolated grammar or vocabulary exercises.

Another important benefit is the development of soft skills. Cyber security specialists need not only technical knowledge but also communication, teamwork, leadership, and decision-making skills. Problem-based learning helps students practise these skills in English. For example, during a group task, one student may summarize the problem, another may explain the risks, and another may present the solution.

However, some challenges should be considered. Problem-based learning can take more time than traditional exercises. Some students may feel shy or may not participate equally in group discussions. Teachers should manage group roles, monitor participation, and create a supportive classroom atmosphere. Assessment criteria should also be clear so that students understand how their language use and problem-solving performance will be evaluated.

For Cyber University, problem-based learning can be a suitable approach because cyber security education naturally involves problem-solving. English classes can support professional development by giving students opportunities to discuss realistic cyber incidents and communicate solutions clearly. In this way, language learning becomes directly connected with students’ future careers.

Conclusion

This article has examined the role of problem-based learning in developing professional English communication skills of cyber security students. The analysis shows that problem-based learning can make English lessons more practical, communicative, and connected with students’ future professional needs.

Problem-based learning helps students develop professional vocabulary, speaking fluency, critical thinking, teamwork, and confidence in English communication. It also prepares students for workplace situations where they need to explain cyber threats, discuss solutions, write reports, and present recommendations.

The study concludes that problem-based learning should be integrated into English for Specific Purposes courses for cyber security students. With careful teacher guidance, appropriate language support, realistic problem scenarios, and clear feedback, this method can help students become more competent and confident users of professional English.

Overall, problem-based learning is not only a language teaching method, but also a professional development tool. It helps cyber security students understand that English is an important instrument for communication, cooperation, and problem-solving in their future careers.

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