

THE ROLE OF TECHNOLOGY IN SELF-STUDY ENGLISH LEARNING OF PHARMACY STUDENTS

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Annotatsiya: Ushbu maqolada farmatsevtika yo‘nalishi talabalari uchun ingliz tilini mustaqil o‘rganishning innovatsion metodikasi tadqiq etiladi. Bu metod farmatsevtika talabalari ingliz tilini mustaqil o‘rganishda duch keladigan o‘quv materiallarini tanlash va olingan bilimlarni mustahkamlash muammolarini yechishga qaratilgan. Ushbu metod ikki bosqichdan iborat bo‘lib, YouTube orqali vizual ma‘lumot olish va generativ sun‘iy intellekt yordamida interaktiv mustahkamlashni o‘z ichiga oladi. Bu nafaqat til o‘rganish samaradorligini oshiradi, balki talabaning tanqidiy fikrlashini rivojlantirishga va o‘z bilimini mustahkamlashiga yordam beradi.

Kalit so‘zlar: farmatsevtika talabalari, o‘quvchi avtonomiyasi, YouTube, Gemini, Sun‘iy intellekt, ESP, mustaqil ta‘lim.

Аннотация: В данной статье рассматривается инновационная методология самостоятельного изучения английского языка для студентов-фармацевтов. Метод направлен на решение проблем выбора учебных материалов и закрепления полученных знаний, с которыми сталкиваются студенты-фармацевты при самостоятельном изучении английского языка. Метод состоит из двух этапов, включающих визуальное получение информации через YouTube и интерактивное подкрепление с использованием генеративного искусственного интеллекта. Это не только повышает эффективность изучения языка, но и помогает студенту развивать критическое мышление и закреплять полученные знания.

Ключевые слова: Студенты-фармацевты, самостоятельность обучения, YouTube, Gemini, Искусственный интеллект, ESP, независимое обучение.

Annotation: This article explores an innovative methodology for independent study of English for pharmacy students. This method is aimed at solving the problems of selecting educational materials and consolidating acquired knowledge that pharmacy students face in independent study of English. This method consists of two stages, which include visual information acquisition via YouTube and interactive reinforcement using generative artificial intelligence. This not only increases the effectiveness of language learning, but also helps the student develop critical thinking and consolidate his knowledge.

Key words: pharmacy students, learner autonomy, YouTube, Gemini, Artificial Intelligence, ESP, independent learning.

Nowadays, technology is an integral part of our daily lives. Since technology was emerged, it transformed various industries, education sphere is also considered to be one of them. According to Eric Ashby, the history of education is marked by four major revolutions, with the development of computer technology representing the fourth revolution. [4, p.380] Many academics have emphasized the importance of educational technologies in the teaching process in their scientific works. Technology is not just a set of tools, but an innovation aimed at creating knowledge, processes and systems that serve to expand human capabilities. According to Joshi, technology is directly related to solving problems and developing information systems. In this process, hardware and software work in harmony. [4, p.381] In modern pharmaceutical education, these opportunities are particularly evident in the process of self-study. According to Adamson, today’s curricula are focused on increasing student autonomy [1, p.23].

Furthermore, the tradition of autonomous learning requires a deeper understanding of the cultural and social context of the learner. Moreover, for students of pharmaceutical field, self-study is also important in formation of professional components. In particular, the role of self-study is great in deepening and consolidating complex terms and chemical processes mastered during the lessons. However, the terminology of this field is distinguished from other by its abstractness and complexity, which creates certain obstacles for the student in the process of self-study. The multimedia approach, that is, obtaining information through videos, helps to solve this problem. Because information

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visualized through videos helps the student to understand the topic more easily and retain terms in long-term memory.

YouTube is a one of the greatest tools to access educational videos in all fields. This app has easy search function, so students can easily find the videos they need. [6, p.249] When Muniyandy et al. (2015) conducted an experiment with Malaysian pharmaceutical students, they found out that YouTube videos help students to understand even the most complicate topics such as making soft gelatine capsule. However, students’ responses showed that “videos alone were not sufficient to understand a topic taught.” [6, p.250]

As a modern teacher assistant, Generative AI, can be the exact tool that solve this problem in a context of autonomous learning. According to Wang et al. (2023) Generative AI like ChatGPT can help students to comprehend complex topics by giving explanations and answering the questions. Although the research of Wang did not show 100 percent success, it still proves that ChatGPT can be used as a tool to scaffold students.

Technique: The Two-Stage Learning Framework

Step 1: Visual engagement via YouTube

In this step, students are instructed to watch a specific visual demonstration on YouTube. The video “How to make a herbal decoction” was selected for this research.

The main goal of this step is to translate abstract chemical formulas and textbook descriptions into concrete laboratory procedures. Students are encouraged to focus on the following while watching the video:

Operational vocabulary: Identifying actions such as weighing, boiling, filtering and adjusting volume.

Visual identification: Seeing real laboratory apparatus (beaker, wire gauze, tripod stand) in use.

Procedural logic: Understanding the sequence of solvent addition to a crude preparation and the physical changes that occur during heating.

By working with this visual content, students go beyond simple memorization. According to Muniyandy, this multimodal approach reduces cognitive load and helps bridge the gap between theoretical English and practical pharmaceutical application. Additionally, working with YouTube content helps students improve their listening and comprehension skills, which will enable them to confidently participate in international pharmaceutical conferences and seminars.

Step 2: Interactive learning with Generative AI

In this step, students reinforce the information they have learned through a multimodal approach using Generative AI. This step is crucial because, it allows students to clarify complex laboratory procedures in the video. By interacting with AI, students can request exercises to reinforce their knowledge.

In this research, Gemini was chosen as Generative AI. For using Gemini as an interactive learning tool, the following prompt can be given: “Can you give me 3 exercises according to this video which include, correct order of the steps, fill in the gaps, and match correct definition of words.”

Exercise 1: Correct Order of Steps

Rearrange the following steps into the correct chronological order as described in the video.

1. Straining: Pour the liquid through a kitchen sieve and muslin cloth into a jug.
2. Simmering: Bring to a boil, then turn down the heat and let it bubble away for 10–15 minutes with the lid on.
3. Preparation: Weigh out the dried herbs (e.g., 36 grams for three doses).
4. Storage: Pour the remaining liquid into a dark glass jar and store it in the fridge.
5. Extraction: Add the herbs and 750ml of water into a stainless-steel pan.
6. Squeezing: Gather the muslin cloth and squeeze it to extract as much liquid as possible from the herbs.

Answers: 3 → 5 → 2 → 1 → 6 → 4

Frame 1: Logical sequencing task

- **Task:** Correct recreate the processes.
- **Pedagogical significance:** This exercise helps the student develop critical thinking and understanding logical connection involved in the processes.

Exercise 2: Fill in the Blanks

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Complete the sentences using the appropriate pharmaceutical or botanical terms.

1. A _____ is specifically used for tough plant materials like roots and bark that require boiling to release their active constituents.
2. Dandelion root acts as a _____ cleanser, helping the body process and remove toxins.
3. Plants like cloves and fennel are rich in _____ **oils**, which provide strong therapeutic effects and flavor.
4. It is vital to use _____ **glass** for storage because ultraviolet light can degrade the medicinal properties of the liquid.
5. If stored for more than 48 hours, the herbal liquid may begin to _____, making it unsafe for consumption.

Answers: 1. Decoction | 2. Liver | 3. Volatile | 4. Dark | 5. Ferment

Frame 2: Filling the gap

- **Task:** Fill in the gaps in the text.
- **Pedagogical Significance:** This exercise develops ESP (English for Specific Purposes) skills. The student does not just memorize words in a dictionary, but also learns to use them in context. This will be a great help when working with professional documents in the future.

Exercise 3: Terminology Matching	
Match the pharmaceutical/herbal term in Column A with its correct definition in Column B.	
Column A	Column B
1. Decoction	A) The process where the plant's chemical compounds are absorbed into the solvent (water).
2. Volatile Oils	B) A state of inactivity or buildup in the body's systems that needs clearing.
3. Infused	C) A method of extraction involving boiling hard plant material in water.
4. Stagnation	D) The speed at which substances move through the metabolic and digestive pathways.
5. Metabolic Transit	E) Potent, aromatic compounds found in plants that evaporate easily.

Answers: 1 — C | 2 — E | 3 — A | 4 — B | 5 — D

Frame 3: Terminology matching

- **Task:** Match the term with its scientific definition.
- **Pedagogical significance:** This exercise provides academic accuracy. This exercise strengthens the student's base on international standards and professional terminology.

In conclusion, using digital technologies such as YouTube videos and Generative AI is very helpful to enhance autonomous learning among ESP students. YouTube videos help to visualize learned materials while artificial intelligence tools help learners to brainstorm what they learnt and clarify their doubts.

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