

REFLECTIONS ON USING CHATGPT TO GENERATE ESP MATERIALS. A CASE STUDY

Olivia CHIROBOCEA-TUDOR¹ 

Article history: Received 14 February 2024; Revised 24 June 2024; Accepted 15 October 2024; Available online 10 December 2024; Available print 30 December 2024.

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ABSTRACT. *Reflections on Using ChatGPT to Generate ESP Materials. A Case Study.* Although artificial intelligence (AI) and its use in language teaching is not new, its more recent configurations and the launch of ChatGPT in 2022 have sparked controversies, resumed discussions about potential apocalyptic consequences and spread fears of an imminent extinction of numerous professions, including teacher. This article endeavors an exploration of the previous research on the use of ChatGPT for language teaching in general, the benefits and limitations ascertained by others who have studied the phenomenon over the past year, since the launch of the chatbot, and their conclusions as to whether language teachers are indeed in danger of extinction. The main purpose of the article, however, is to ascertain certain aspects of ChatGPT's use for ESP, namely whether it can generate relevant results that can actually help teachers save time in creating useful, comprehensive and interesting materials using specific terminology, especially from niche fields such as horticulture, for which ready-made materials or extensive glossaries may not be available or suitable for their students. A line of questioning was developed within a case study in order to build a corpus of responses that can be used to analyze its utility in generating useful ESP materials. The findings of the study support to a large extent those of previous researchers in terms of reserve towards the

¹ **Olivia CHIROBOCEA-TUDOR** is an associate professor Ph.D. at the Faculty of Letters (Ovidius University of Constanta). She teaches ESP to students at the Faculty of Natural and Agricultural Sciences. She has published several English courses for ESP students, a specialized bilingual dictionary of viticulture and winemaking as well as numerous articles on topics related to ESP teaching methods, terminology and specialized translation. She collaborated as reviewer with several international journals. In 2022 she became director of the Centre for Research on Specialized Languages from a Multidisciplinary Perspective within the Faculty of Letters (Ovidius University of Constanta, Romania), where she coordinates teams of researchers in the field of languages for specific purposes. ORCID iD: <https://orcid.org/0000-0002-2850-3094>; Email: chirobocea.olivia@365.univ-ovidius.ro.

reliability of the information generated. However, it also offers options and ways in which adequate prompts can lead to useful teaching materials that are generated according to the teachers' parameters and their students' needs.

Keywords: *ChatGPT, chatbot, artificial intelligence (AI), English for Specific Purposes (ESP), horticulture*

REZUMAT. Reflecții asupra folosirii ChatGPT pentru generarea de materiale didactice pentru engleza pentru scopuri specifice. Studiu de caz. Chiar dacă inteligența artificială (IA) și folosirea ei în predarea unei limbi nu este o noutate, configurările ei recente și lansarea *chatbot*-ului ChatGPT în 2022 au dat naștere la controverse, au reaprins discuțiile despre posibile consecințe apocaliptice și au răspândit temeri legate de dispariția iminentă a numeroase profesii, inclusiv a celei de profesor. Acest articol explorează cercetările anterioare despre folosirea *chatbot*-ului ChatGPT pentru predarea limbilor în general, despre beneficiile și limitările constatate de alți cercetători care au studiat fenomenul pe parcursul anului care a trecut de la lansarea acestui *chatbot*, cât și concluzia lor în privința pericolului de dispariție a profesiei de profesor. Scopul principal al articolului este, de altfel, evaluarea anumitor aspecte ale utilizării *chatbot*-ului ChatGPT pentru engleza pentru scopuri specifice, și anume dacă el poate general rezultate relevante care pot ajuta într-adevăr profesorii să economisească timp în crearea de materiale didactice folositoare, cuprinzătoare și interesante folosind terminologie specifică, mai ales din domenii de nișă cum este horticultura, și pentru care nu există materiale potrivite pentru nevoile studenților sau glosare cuprinzătoare de termeni specifici. S-a dezvoltat astfel o serie de întrebări în cadrul unui studiu de caz pentru a obține un corp de răspunsuri care să fie folosit pentru a evalua utilitatea *chatbot*-ului în generarea de materiale pentru astfel de cursuri. Concluziile studiului le susțin în mare parte pe cele ale cercetărilor anterioare în privința rezervei cu care ar trebui să tratăm caracterul de încredere al informațiilor generate. Dar studiul oferă și opțiuni și modalități de a comunica eficient cu *chatbot*-ul astfel încât să putem obține materiale didactice care să corespundă parametrilor profesorului și nevoilor studenților.

Cuvinte-cheie: *ChatGPT, chatbot, inteligența artificială (IA), engleza pentru scopuri specifice, horticultura*

Introduction

Nowadays, AI is mostly associated with the controversy surrounding chatbots, especially since the launch of ChatGPT in late 2022. In fact, pulling that thread only unravels the multitude of AI that is readily available to anyone,

often for free. The fact is that AI has been around for years albeit in simpler and more controlled configurations. Still, its more evolved forms (generative AI and large language models) and the race by various companies to create their own chatbot seems to have radically changed our perception of AI as people from all walks of life are commenting and warning about the dangers of AI. However, behind the apocalyptic alarms, regular people are taking advantage of AI and chatbots for everyday tasks that can be expedited with their help. Teachers are one such category, notoriously in constant need of time for the preparation of teaching materials and administrative work.

This article will explore the use of AI, specifically ChatGPT, in English teaching in general and English for specific purposes (ESP) in particular. It will begin with a thorough review of the literature by exploring the findings of researchers that have already investigated the use of AI and chatbots in language teaching. This review will offer a balanced glimpse into both positive and negative aspects discovered in previous studies, as well as exactly how reliable the use of AI can be in language teaching and what the perceptions are from those involved, both learners and educators. The study will then focus on the unique position that ESP teaching materials hold within English teaching in general, and the teachers' active involvement and effort in continually generating and adapting them to specific groups of learners. These aspects are important when ChatGPT comes into play because the chatbot may be used to efficiently mitigate this effort and time that ESP teachers allot to the generation of teaching materials.

However, the issue that comes into question at this point is the quality of this help, given the controversies highlighted by previous literature, therefore the main objective of this study is to attempt to provide some insights into how efficient the chatbot actually is as well as how accurate, reliable and usable the results obtained are. Within this case study involving ChatGPT (the version updated in January 2022), a line of questioning was developed in order to build a corpus of responses that represents a snapshot into its utility in generating useful ESP materials. Thus, the chatbot was asked to generate word lists for branches of a niche domain (horticulture) and then, by using the word lists, to generate activities that would practice the specific terminology. The purpose was to explore whether the chatbot offers usable results in terms of relevant and comprehensive terminology specific to less studied ESP domains, such as English for horticulture, and then if it can create practical activities by using the resulting terminology in order to improve and expedite the generation of teaching materials.

These aspects, if true, would represent important advantages for ESP teachers because they would be able to gain time, streamline the focus of the

lessons and also include significant terminology that may otherwise be overlooked. The study specifies both the positive aspects that were observed and some shortcomings that should be considered when ChatGPT is used for the purposes state above. The value that this study adds to the research in this field consists in the approach, the actual dialogue with the chatbot that led to particular answers, the line of questioning and the application of the inquiry to a less studied area of ESP, English for horticulture. The results, however, can be adapted to any other domain, as the study will conclude.

Perceptions about ChatGPT in language teaching and ESP – a literature review

The literature on the topic of AI in education and English teaching is considerable, given the novelty of the subject, but not all aspects have been studied yet. The first reactions came immediately after ChatGPT was launched in 2022, with an uproar among teachers in general (Kostka and Toncelli 2023, 3), who mostly viewed the chatbot as the end of education and, by extension, of themselves as educators, with some even admitting despair in the face of this unprecedented challenge. Discussions about whether we should love it or hate it, embrace it or ban it were everywhere in the tertiary education systems (Sims 2023; Stening 2023) and, even though the acute fears have dissipated somewhat after the initial shock, the underlying issues are still present.

Although many research papers about the benefits and limitations of ChatGPT in education have been written since its advent, the potential for AI, such as chatbots, to transform language teaching in particular is a topic of ongoing research. The main fears of language teachers regarding the use of ChatGPT and other AI chatbots in education touch upon several critical concerns. Some of the most prevalent are apprehensions regarding the potential for cheating, rendering the idea of homework useless (Kostikova et al. 2024, 78) and over-reliance on chatbots, which could compromise the authenticity and originality of students' work, leading to academic integrity issues (Habeab Al-Obaydi, Pikhart and Klimova 2023; Ohashi and Alm 2023; Rahman and Watanobe 2023). In March 2023, a few months after it was launched, Grant Cooper remarked, tongue-in-cheek, that "ChatGPT has gone viral on social media, and anecdotal evidence suggests that students are already familiar with it." (Cooper 2023, 445). Others, similarly draw attention to serious cheating issues (Rahman and Watanobe 2023, 16). In fact, Lo's review article indicates that students' plagiarism, meaning the use by students of ChatGPT in order to generate texts that they can then pass as their own rather "defeats the purpose of assessment,

which is to evaluate student learning fairly.” (Lo 2023, 10). This indicates the need for immediate action to update guidelines and policies for academic integrity and plagiarism prevention in educational institutions.

Other concerns have been raised about the impact of chatbots on critical thinking skills and creativity. Researchers’ assessments conclude that, indeed, “the reliance on AI technology may hinder the development of critical thinking and problem-solving skills.” and that “ChatGPT may not be able to provide culturally sensitive and context-specific responses. The language generation of ChatGPT relies on large-scale pre-training, which may not fully account for cultural nuances and specific context” (Hatmanto and Sari 2023, 16). Concerns about ethical implications and biases, as well as the fact that “simply acquiring answers and code from ChatGPT can be a barrier to improving learners’ critical thinking and problem-solving skills” (Rahman and Watanobe 2023, 17) remain prevalent. Such fears are echoed by many teachers.

There is also the potential disruption of the student-teacher relationship, which has traditionally been fundamental to the teaching process (Koh et al. 2023; Rahman and Watanobe 2023). In this regard, the majority of participants in Chan and Tsi's study (2023) argue that human teachers possess unique qualities that make them irreplaceable, emotional connection, among them. In the same vein, Hié remarks that “On the one hand, it [AI] cannot take the place of teachers. On the other hand, it can assist them and effectively complement existing educational systems.” (Hié 2023) reiterating thus Alex Sims who states that “AI tools are not a replacement for human expertise but rather that they are tools that can augment and enhance it” (Sims 2023). Similarly, Lo’s review highlights the potential benefits of ChatGPT as an assistant for instructors in suggesting syllabus and creating teaching materials or interactive activities, and a virtual tutor for students (Lo 2023, 10), as was the case with the results of other researchers already mentioned. Thus, at least for the moment, AI seems to be unlikely to fully replace human teachers, even though it may play a significant role in the future of language teaching. ChatGPT itself reassures us that English teachers, especially in the context of English for Specific Purposes (ESP), cannot be replaced by AI and it gives seven reasons for this (see Figure 1), all of them revolving around the same issue: the irreplaceable human touch.



ChatGPT

While ChatGPT and similar AI technologies have the potential to supplement and enhance language teaching, they cannot fully replace English teachers, especially in the context of English for Specific Purposes (ESP). Here are several reasons why:

1. **Lack of Human Connection:** ChatGPT lacks the human touch and emotional intelligence that human teachers bring to the learning environment. Human teachers can build rapport with students, provide personalized support, and understand the individual needs and learning styles of each student.
2. **Adaptability and Flexibility:** Human teachers can adapt their teaching methods and materials based on real-time feedback and observations of student progress. They can modify lesson plans, provide additional explanations, and offer alternative learning strategies to address students' varying levels of proficiency and comprehension.
3. **Cultural and Contextual Understanding:** Human teachers possess cultural awareness and contextual understanding that enable them to provide language instruction tailored to the specific cultural backgrounds, communication styles, and professional or academic contexts of their students. This is particularly crucial in ESP, where language instruction must align with the specific needs of learners in their professional or academic fields.
4. **Complex Language Skills:** Teaching language involves more than just providing grammatically correct responses or vocabulary definitions. Human teachers can facilitate meaningful communication, encourage critical thinking, foster creativity, and address complex language skills such as pronunciation, intonation, pragmatics, and sociolinguistic competence.
5. **Dynamic Interaction:** Human teachers engage in dynamic interactions with students, fostering opportunities for authentic communication, collaborative learning, and real-world language use. They can lead discussions, facilitate group activities, provide immediate feedback, and create interactive learning experiences that go beyond text-based interactions.
6. **Ethical Considerations:** There are ethical considerations related to the use of AI technologies in education, including issues of data privacy, algorithmic biases, and the potential for over-reliance on technology at the expense of human-centered learning experiences. Human teachers can navigate these ethical concerns and provide a more holistic and responsible approach to language instruction.
7. **Professional Development:** Human teachers undergo extensive training, professional development, and ongoing reflection to enhance their teaching skills, stay updated with best practices in language teaching, and adapt to evolving educational trends and technologies. They bring a wealth of pedagogical expertise and experience that cannot be replicated by AI technologies alone.

Figure 1. ChatGPT's response to the question "Can ChatGPT replace English teachers in general and, more specifically, teachers of English for specific purposes?" (generated by ChatGPT in February 2024)

Another major concern among language teachers is the credibility and reliability of information provided by AI chatbots, as well as the challenges in evaluating and verifying content generated by these systems (Temsah et al 2023; Elali and Rachid 2023). Thus, while ChatGPT can generate human-like responses and assist with complex tasks (Zhu et al. 2023), it may also produce inaccurate, fabricated, and biased information because ChatGPT has “the potential to generate plausible but incorrect or made-up responses.” (Xiao and Zhi 2023, 3). Lo’s review article also raises concerns about ChatGPT’s poor judgment of correctness, generation of fake articles with non-functional URLs, poor performance in exams and mathematical abilities, and its capacity to bypass conventional plagiarism detectors (Lo 2023). This aspect is particularly important for ESP teachers as they require texts that provide true information from various technical or scientific fields that are difficult to verify by someone without expertise. They would have to spend time checking the information themselves or work with specialists that would give their approval for its veracity. This is already happening and has been the method for years but AI was thought to be a miracle-worker that would rid us of this tedious part of the work and save us time.

However, not all is doom and gloom. In spite of the assorted fears expressed by the various studies mentioned above, there are also some positive aspects of integrating artificial intelligence (AI) and ChatGPT in English teaching. For example, AI-based platforms can be created “to help students improve their English language teaching efficiency in line with their mastery of knowledge and personality” (Sun 2020, 1). The application of AI technology in English education has been shown to optimize the English classroom, providing support for intelligent and collaborative teaching (Zhu 2022). English teaching methods using AI are efficient in improving the English teaching environment and in personalizing the learning experience for students (Xie 2022). The use of AI in English teaching has the potential to alleviate the burden on teachers and improve teaching quality (Yang 2022). When it comes to chatbots, ChatGPT, known for its ability to realistically mimic human conversation, presents a new avenue in language learning, offering new opportunities for language teaching and learning (Kohnke, Moorhouse and Zou 2023). ChatGPT also has impact on learning motivation as research has highlighted its potential to enhance active listening and engagement in language learning (Ali et al. 2023). Among the most important advantages is that ChatGPT also helps teachers create materials that can be modulated according to the students’ needs and proficiency levels (Shalevska 2023, 111; Xiao and Zhi 2023, 2).

In terms of ESP in particular, a complex study that explores the use of AI and ChatGPT for generating a Law English course, complete with a curriculum and a syllabus for tertiary level students, draws the positive conclusion that ChatGPT can be used for a wide variety of educational purposes, including providing information, generating necessary texts, tasks, tests, questions, aiding in textbook creation, and facilitating the design of interactive, language-focused tasks for student engagement and skill development (Kostikova et al. 2024). They also specify that, in spite of the fact that any such material generated by chatbots must necessarily be checked and adjusted, using this AI tool saves time, nevertheless (73). The study also specifies the limitations of using ChatGPT for the purpose described and these are, as other research has already shown, the danger of generating incorrect information, the inability to adapt to students' specific needs and the "risk of overreliance on ChatGPT that may hinder critical thinking and problem-solving skills if not balanced with human guidance and interaction" (Kostikova et al. 2024, 78). Shalevka's 2023 article also indicates that vocabulary in particular can be taught and practiced by using ChatGPT to target specific terms and create any number and variations of activities involving them.

ChatGPT is by no means the only AI tool that can be used to generate teaching material. It is, however, the focus of this particular article, drawing upon the experience of using this chatbot to create materials for ESP, specifically for more niche domains. Therefore, ChatGPT was asked to give its "opinion" about this proposal and demanded some advantages and disadvantages. Its reply can be read in Figure 2. Thus, the chatbot itself seems to play fair and draw attention to its own limitations but also points potential benefits of using it for the generation of ESP teaching materials. It is interesting that it specifies potential lack of domain-specific knowledge as a first limitation, which is very important for ESP teachers, as well as potential for misinformation. These are both related and connected to the models on which the chatbot was trained, including the fact that it was last updated, as of this moment, in January 2022 (when asked in February 2024, ChatGPT responded that it is not connected to the internet, does not have real-time access to websites or databases and its answers are generated based on the text data it was trained on up to January 2022).



ChatGPT

It's okay for teachers of English for Specific Purposes (ESP) to generate specialized teaching materials using ChatGPT, but it's important to consider both the advantages and disadvantages of doing so:

Advantages:

1. **Efficiency:** ChatGPT can generate content quickly, allowing teachers to create customized teaching materials tailored to the specific needs and interests of their learners in a timely manner.
2. **Versatility:** ChatGPT can generate various types of content, including text passages, questions, exercises, and explanations, providing teachers with a wide range of resources to support their instruction in ESP.
3. **Access to diverse content:** ChatGPT can access a vast amount of data from different sources, enabling teachers to incorporate diverse perspectives, examples, and contexts into their teaching materials.
4. **Adaptability:** ChatGPT can adapt its responses based on teachers' input, allowing for iterative refinement and customization of teaching materials to better meet the evolving needs of learners in ESP.
5. **Supplemental support:** ChatGPT-generated materials can supplement traditional teaching resources, providing additional practice opportunities, vocabulary expansion, and contextualized language use in specific professional or academic contexts.

Disadvantages:

1. **Lack of domain-specific knowledge:** ChatGPT may not possess specialized knowledge or terminology relevant to specific professional or academic fields, leading to inaccuracies or incomplete explanations in teaching materials.
2. **Limited contextual understanding:** ChatGPT may struggle to understand the specific contexts and communication needs of learners in professional or academic settings, resulting in teaching materials that are not aligned with learners' specific goals and objectives.
3. **Potential for misinformation:** ChatGPT generates responses based on patterns in the data it was trained on, which may include inaccuracies or biases, leading to the propagation of misinformation in teaching materials.
4. **Inability to provide personalized feedback:** ChatGPT-generated materials may not offer personalized feedback tailored to individual learners' language needs in specific professional or academic domains, limiting their effectiveness in addressing learners' unique challenges and areas for improvement.
5. **Ethical considerations:** There are ethical concerns related to using AI in education, including issues of data privacy, algorithmic biases, and the potential for over-reliance on technology at the expense of human-centered learning experiences.

Figure 2. ChatGPT's response to the question "Is it ok for ESP teachers to generate specialized teaching materials using ChatGPT? What are the advantages and disadvantages?" (generated by ChatGPT in February 2024)

The issue of ESP materials

The use of authentic materials in ESP is paramount and, although there is a general consensus in literature regarding this aspect (Benavent and Peñamaría 2011, 89; Blagojević 2013, 113), there are various problems within this general framework. Authentic materials are, by definition, taken from the real world and thus, not created for pedagogical purposes (Benavent and Peñamaría 2011; Bacon and Finnemann, 1990) but they “are particularly important for communicative purposes since they reproduce an immersion environment and provide a realistic context for tasks that relate to learner’s needs”. (Benavent and Peñamaría 2011, 89). Also, “they are proof that the language is used for real-life purposes by real people” (Nuttall 1996, 172), therefore this may increase learners’ motivation. Unfortunately, the major problem with authentic materials is that, since they are not created for pedagogical purposes, they will often be too long, too complex and too difficult, and maybe not containing an optimal amount of relevant terminology. Therefore, the teachers must do the work of adaptation and selection according to their students’ level of English proficiency, as well as lesson purpose (Benavent and Peñamaría 2011, 90; Buzarna-Tihenea and Nădrag 2018, 146). In a complex analysis of this issue, Savka Blagojević includes opinions that argue either for or against the suitability of authentic materials in terms of English proficiency (Blagojević 2013, 115), therefore the issue is split. The researcher also mentions the idea that an authentic text becomes less so once it is brought into the classroom and questions whether the materials used in class still reflect the real language use or just imitate it (Blagojević 2013, 116). Pointing out these aspects regarding authentic materials is important because, in one way or another, they might be questioned when ChatGPT is involved, as will be discussed herein.

My personal experience for over twenty years of teaching ESP to the same related programs (biology, ecology, agriculture and horticulture) has been of constantly looking for texts written by specialists in the field, on topics relevant to the program, which would contain as much relevant specialized terminology as possible. The texts I would normally find have the usual problems, too long and too specialized, and thus too difficult as most of my students are not highly proficient in English. Therefore, I would always spend a considerable amount of time editing the text, shortening it, making it more “palatable” and also trying to adapt the language to lower levels of English proficiency while keeping the relevant terminology in place. After that, the text will become the basis for further activities. This is usually the experience that most ESP teachers will recognize in their own activity (Elkasović and Čolakovac 2023), especially for certain domains for which published manuals or ready-made materials may not be available. ChatGPT, however, can be used to reduce this load of work considerably.

There are needs that can be supplanted by ChatGPT for the generation of targeted ESP materials. For example, in the ESP domains named above there may be need for explanatory or argumentative texts about topics such as “the influence of weather on agriculture”, “the use of landforms in agriculture”, “soil pollution in/by agriculture”, “the environmental impact of agriculture” and many other similar ones. Normally, various sources would be explored, but the results would often be inappropriate for reasons already mentioned above: too long or too short, not explanatory enough, too general or too specific, too difficult, not containing enough relevant terminology, etc. It would take time to find the most suitable text and then more time to adapt it and then even more time to extract terminology and create follow-up activities. ChatGPT, however, will draw upon its resources to generate in seconds a well-rounded text that touches upon the most relevant issues related to the topic. The text will be as long as we need it to be, it will use terminology as prompted and will be appropriate for the required English level. For example, the chatbot was given the following prompt: “Generate a text (approx. 300 words) about the environmental impact of agriculture for B1-B2 level students. The text should contain relevant specialized terminology specific to the topic.” It generated a text as seen in Figure 3.

Title: The Environmental Impact of Agriculture

Agriculture plays a vital role in providing food, fuel, and fiber for human consumption and industrial use. However, it also has significant environmental impacts that can affect ecosystems, biodiversity, and natural resources.

One of the primary environmental concerns associated with agriculture is soil erosion. Soil erosion occurs when the top layer of soil is removed or displaced by wind, water, or human activities such as plowing. This can lead to the loss of fertile soil, which is essential for crop growth, and contribute to sedimentation in rivers and streams, affecting water quality and aquatic habitats.

Another environmental impact of agriculture is water pollution. Agricultural activities such as the use of fertilizers, pesticides, and animal waste can contaminate water sources with nutrients and chemicals, leading to eutrophication, algal blooms, and the depletion of oxygen levels in aquatic ecosystems. This can harm aquatic organisms and disrupt the balance of freshwater ecosystems.

Furthermore, agriculture contributes to greenhouse gas emissions, primarily through the release of methane from livestock digestion and manure management, and nitrous oxide from fertilizers and soil management practices. These greenhouse gases contribute to global warming and climate change, which can have far-reaching impacts on weather patterns, sea levels, and ecosystems worldwide.

Additionally, agricultural practices can lead to deforestation and habitat destruction, particularly in tropical regions where forests are cleared for agricultural expansion. This loss of habitat can threaten biodiversity and disrupt the balance of ecosystems, leading to the decline or extinction of plant and animal species.

To address these environmental challenges, sustainable agricultural practices are being promoted, such as conservation tillage, crop rotation, integrated pest management, and agroforestry. These practices aim to minimize soil erosion, reduce water pollution, mitigate greenhouse gas emissions, and preserve biodiversity while maintaining or increasing agricultural productivity. By adopting sustainable practices, farmers can help minimize the environmental impact of agriculture and promote the long-term health and resilience of ecosystems.

Figure 3. ChatGPT’s response to the prompt “Generate a text (approx. 300 words) about the environmental impact of agriculture for B1-B2 level students. The text should contain relevant specialized terminology specific to the topic.” (generated by ChatGPT in February 2024)

This text has 312 words, a title, paragraphs that make the necessary points and also has readability, meaning it is easy to understand by students with intermediate knowledge of English while also containing potentially new general English terms (e.g. *provide, displaced, lead to, depletion, disrupt, far-reaching, mitigate, resilience*) as well as a considerable amount of specific terminology in the form of words and collocations such as *fuel, environmental impact, ecosystem, biodiversity, soil erosion, plowing, crop growth, sedimentation, aquatic habitats, water pollution, fertilizers, pesticides, animal waste, contaminate, eutrophication, algal blooms, freshwater ecosystems, greenhouse gas emissions, methane, livestock digestion, manure management, nitrous oxide, global warming, climate change, weather patterns, sea levels, deforestation, habitat destruction, cleared, balance of ecosystems, extinction of animal species, sustainable agricultural practices, conservation tillage, crop rotation, integrated pest management, agroforestry*. Similar texts can be generated on an infinite number of topics, within specific parameters, and they can represent the basis for text comprehension questions, vocabulary or grammar activities, also created by ChatGPT or not or by a different AI software, as we choose.

ChatGPT snapshot – generating word lists and ESP materials

Apart from the option of asking the chatbot to generate a text using the relevant terminology it sees fit, there is also the reverse solution, where we provide the chatbot with the exact terminology we need and it will then generate a suitable text for this purpose. In my teaching activity, as I mentioned previously, published materials with an adequate amount of terminology and authentic texts are nonexistent, scarce or unsuitable for my students enrolled in programs such as agriculture or horticulture. Horticulture, in particular, is especially difficult in this regard. I am very interested in my students acquiring an adequate amount of specialized terminology in their field in English, therefore, for optimal efficiency (as time limitations are a major problem), it would be very helpful to start from terminology and go towards activities.

Word lists play an important role in ESP teaching materials, particularly in the academic context (Paquot 2007, 127). The General Service List (GSL) generated by Michael West in 1953 and updated in 2013 by Brezina & Gablasova (Brezina & Gablasova, 2015) and Browne, Culligan and Phillips (Browne, 2013) has been a foundational resource in this area (Kwary and Jurianto 2017, 60), and the creation of frequency-based word lists is a key consideration in vocabulary course design (Nation, 2016, 3). In a comprehensive book called *Vocabulary and English for Specific Purposes Research*, Averil Coxhead analyzes in great detail the way in which teachers, researchers and course designers can

determine what and how much specialized vocabulary is to be selected for teaching in ESP by naming in the first chapter certain avenues for the identification of such vocabulary such as comparing corpus and analyzing keywords by means of software and statistical analysis, by using technical dictionaries, consulting experts or by employing surveys, interviews and questionnaires (Coxhead 2018, 16-30), while in the second chapter the scholar details the importance of word lists for course design as well as methods of generating them using a corpus of authentic texts from the respective domain (Coxhead 2018, 31-60).


Word lists are a very important starting point for course design, but they are not easy to generate. Certain fields like business, law or medicine have established glossaries that are readily available in many resources. Other less common areas of ESP do not benefit from the same attention and their available glossaries are hard to find and not comprehensive. However, regardless of field, generating such word lists is time-consuming and requires access to a large corpus of texts from various subcategories of the larger domain in order to analyze it using software, statistical analysis and other methods.

Over the years, I have compiled a glossary of important terms in horticulture, but it took time and it still does not include an adequate number of, arguably, the most frequent terms. It would be even more helpful to have a comprehensive list of terms from each of the branches of horticulture, such as viticulture, pomiculture, olericulture, floriculture etc. This way, I would ensure a good cover of the entire domain for my students in a more efficient manner. Apart from the specialized and highly specialized words, there are also many high-frequency words that can often be found in compounds or collocations that have specific meaning for that respective field (Coxhead 2018, 53) and these combinations are also important to understand in regards to both meaning and use: "It is therefore particularly important that new words be introduced together with information on how to use them, especially their collocational and colligational environment" (Paquot 2007, 127).

This is where ChatGPT can come in handy. After exploring the chatbot by means of various inquiries related to the generation of ESP materials, a line of questioning was developed in order to build a corpus of responses that can be used to analyze its utility in generating useful ESP materials. However, since the chatbot is a conversational AI, there was a dialogue that we engaged in and, therefore, the questions were also adapted as the chatbot provided answers. What follows is an example of how ESP teachers could work with ChatGPT in order to obtain the most useful results for their needs and what they can expect from the chatbot, both the positive aspects and some issues that require caution.

Before asking it to generate word lists, the chatbot was first asked for its opinion on the most efficient use of word lists in ESP and its answer can be seen in Figure 4. The uses it proposes are comparable to those discovered in my

extensive experience, therefore, there is nothing new in its suggestions, but rather confirmation.

 ChatGPT

Word lists can be used efficiently by teachers who teach English for specific purposes in several ways:

1. **Vocabulary Building:** Word lists provide a structured way to introduce and reinforce vocabulary related to a specific field or topic. Teachers can use word lists to systematically teach and review key terms, ensuring that students develop a strong foundation in the specialized vocabulary relevant to their field of study.
2. **Customized Learning Materials:** Teachers can use word lists as a basis for creating customized learning materials tailored to the needs and proficiency levels of their students. These materials can include vocabulary worksheets, flashcards, quizzes, and exercises designed to help students practice and internalize the specialized terminology.
3. **Content-Based Instruction:** Word lists serve as a valuable resource for content-based instruction, allowing teachers to design lessons and activities that integrate language learning with subject matter content. By incorporating specialized vocabulary from the word list into reading passages, discussions, and writing tasks, teachers can facilitate language acquisition while simultaneously engaging students with relevant subject material.
4. **Contextual Learning:** Word lists provide context for vocabulary acquisition by presenting terms within the context of a specific field or topic. Teachers can use real-world examples, images, and multimedia resources to illustrate the meaning and usage of words from the list, helping students understand how the vocabulary is applied in practical situations.
5. **Assessment and Progress Monitoring:** Word lists can be used as a basis for assessing students' vocabulary knowledge and tracking their progress over time. Teachers can administer vocabulary quizzes, assignments, and assessments based on the word list to evaluate students' mastery of the specialized terminology and identify areas for further instruction and reinforcement.
6. **Self-Study and Review:** Word lists can also be shared with students for self-study and review purposes. Students can use the word list as a reference tool to independently review vocabulary, create their own study aids, and practice using the terms in context through reading, writing, and speaking activities.

Overall, word lists serve as a valuable tool for teachers of English for specific purposes, enabling them to effectively teach and reinforce specialized vocabulary in a targeted and systematic manner, ultimately supporting students' language learning and academic success in their chosen field of study.

Figure 4. ChatGPT's response to the question "How can word lists be used efficiently by ESP teachers?" (generated by ChatGPT in February 2024)

When asked to create a specific word list of 1000 specialized terms in horticulture, its reply was a refusal, as illustrated in Figure 5, followed by an alternative as it proceeded instead to provide a list of 100 terms with definitions.

 **ChatGPT**

Creating a comprehensive list of 1000 specialized terms in horticulture would be quite extensive. Instead, I'll provide a condensed list of specialized terms commonly used in horticulture. This list includes terms related to plant anatomy, cultivation practices, gardening techniques, and plant diseases. Here are 100 specialized terms in horticulture:

1. Abiotic: Non-living factors that affect plant growth, such as temperature, light, and soil.
2. Acclimatization: The process of plants adjusting to new environmental conditions.
3. Acidic soil: Soil with a pH below 7, suitable for acid-loving plants.
4. Adventitious roots: Roots that form from non-root tissues, such as stems or leaves.
5. Aeroponics: A method of growing plants without soil, using a nutrient-rich mist to deliver nutrients directly to plant roots.
6. Allelopathy: The ability of some plants to release chemicals that inhibit the growth of other plants.
7. Anthesis: The period during which a flower is fully open and functional.
8. Annual: A plant that completes its life cycle within one year.
9. Anthocyanin: Pigments responsible for red, purple, and blue colors in plants.
94. Thigmotropism: The response of plants to touch or physical contact, often leading to changes in growth or orientation.
95. Topiary: The art of trimming and shaping plants into decorative or ornamental forms.
96. Transpiration: The loss of water vapor from plant leaves through small openings called stomata.
97. Tuber: A thickened, underground stem used for storage and vegetative reproduction, such as in potatoes.
98. Variegated: Having leaves or other plant parts with contrasting colors or markings.
99. Vascular bundle: A strand of tissue in plants that transports water, nutrients, and sugars throughout the plant.
100. Xeriscaping: Landscaping or gardening practices designed to conserve water and minimize water use, particularly in arid or drought-prone regions.

This list provides a snapshot of specialized terminology in horticulture, covering a range of topics relevant to plant biology, cultivation practices, and gardening techniques. Keep in mind that horticulture is a diverse field with many sub-disciplines and specialized areas of study, so this list is not exhaustive but rather a starting point for further exploration.

Figure 5. ChatGPT's response to the prompt "Create a list of 1000 specialized terms used in horticulture" (generated by ChatGPT in February 2024)

Given that horticulture is a rather vast field, with several important branches, the decision was to refine this list for better results and the chatbot was asked to provide a list of 500 specialized terms from floriculture, for a start, without definitions. This list contained a mixture of terms, in alphabetical order, therefore a separation of the 500 terms into certain major categories was demanded and the chatbot decided on the following three: plant biology and physiology, cultivation and agricultural practices and plant names. Given that each category was rather large and still mixed, a further grouping was required and ChatGPT decided on the following subcategories for each of the larger categories named above, as presented in Table 1 (selection):

Table 1. Subcategories of terms generated within the larger word list of terms from floriculture (generated by ChatGPT in February 2024).

Cultivation and Agricultural Practices	
Plant Propagation and Growth	<i>aerial root, cotyledon, cutting, germination, grafting, mulch, rootstock, scion, seed dispersal, seedling, sucker</i>
Soil and Water Management	<i>carbonic maceration, cold soak, cold stabilization, compost, container, cover crop, drip irrigation, fertilization, hydroponics, irrigation, soil erosion, soil PH, tillage, watering</i>
Pest and Disease Management	<i>antibiosis, bacterial wilt, biocontrol, fungicide, fumigation, insectivorous, pest control, weedkiller</i>
Harvest and Post-Harvest Practices	<i>crop rotation, harvest, pruning, thinning</i>
Specialized Techniques and Practices	<i>aeroponics, arboriculture, bonsai, forestry, grafting, greenhouse, incubate, permaculture, rootstock, scion</i>
Plant Names	
Flowering Plants	<i>amaryllis, daffodil, daisy, cauliflower, bellflower, carnation, dianthus, morning glory</i>
Herbs and Spices	<i>cilantro, dill, mint, sage, bay laurel, clove</i>
Fruits and Vegetables	<i>cucumber, pumpkin, apple, pear, pepper, potato, grape</i>
Trees and Shrubs	<i>cypress, oak, pine, hawthorn</i>
Ornamental Plants	<i>amaryllis, azalea, rhododendron, orchid, rose, snapdragon</i>
Miscellaneous	<i>pineapple, soybean, asparagus</i>
Plant Biology and Physiology	
Plant Anatomy	<i>aerial root, basal rosette, cambium, cotyledon, corm, internode, lenticel, rootstock, scion, sucker</i>
Plant Growth And Development	<i>acrotonic, apical dominance, dormancy, germination, flowering, photosynthesis, pruning, thinning</i>
Plant Reproduction	<i>apothecium, capsicum, cross pollination, pollination, seed dispersal, seedling, self-pollination</i>
Plant Physiology	<i>abiotic stress, abscission, chlorophyll, fatty acid, immunity, infection, lipid, longevity, measurement</i>
Plant Adaptations	<i>symbiosis</i>

This is just an example, but the lists can be either refined more or limited to certain specific subcategories within larger ones. This way, more specific terms can be discovered and used to generate further materials. For example, the chatbot was asked to generate a list of 100 terms (shorter, since it is a subcategory of a subcategory) from floriculture referring to flower arrangement and floristry. Then, it was required to group the terms into a few relevant categories (Table 2).


Table 2. Subcategories of terms generated within the larger word list of terms related to flower arrangements and floristry (generated by ChatGPT in February 2024).

Techniques and Styles	e.g. <i>armature, cascade bouquet, cluster arrangement, collar arrangement, French bouquet</i>
Arrangement Types	e.g. <i>boutonniere, bridal bouquet, centerpiece, corsage, foliage arrangement, garlands</i>
Tools and Materials	e.g. <i>floral foam, floral tape, floral wire, floral wire cutter, floristry knife, flower preservative, flower stand, flower vase</i>
Flower Types and Characteristics	e.g. <i>cut flowers, filler flowers, line flowers, seasonal flowers, summer bouquet, tropical flowers</i>
Design Principles and Concepts	e.g. <i>balance, color harmony, design mechanics, grid arrangement, knotting technique</i>
Special Occasions and Events	e.g. <i>garden-style arrangement, spring bouquet, wedding bouquet</i>
Miscellaneous	e.g. <i>ribboning technique, staging, unity, pillar arrangement, traditional arrangement</i>

Using this list of terms, ChatGPT can generate various types of vocabulary activities such as matching term with description, fill in the blanks, sentence building, multiple choice and others. In fact, the chatbot itself made a few suggestions (Figure 6). All that is left for us is to simply choose and it should be able to generate any type of activity for us.

 ChatGPT

You can create various exercises and activities using a word list from floriculture to help students enhance their vocabulary, comprehension, and application of terms related to flower cultivation, arrangement, and floristry. Here are some types of exercises you can consider:

1. **Matching Exercises:**
 - Match each term with its definition or description.
 - Match each term with its corresponding image or illustration.
2. **Multiple Choice Exercises:**
 - Provide multiple-choice questions where students choose the correct definition or synonym for each term.
 - Present sentences with blanks and ask students to select the correct term to fill in the blank.
3. **Vocabulary Quizzes:**
 - Create quizzes where students must define each term from the word list.
 - Include fill-in-the-blank questions with terms from the word list.
4. **Word Association:**
 - Ask students to brainstorm related words or concepts for each term from the word list.
 - Provide a word from the list and ask students to generate a list of synonyms or antonyms.
5. **Sentence Writing:**
 - Have students write sentences using each term from the word list to demonstrate their understanding of how the terms are used in context.
 - Assign creative writing tasks where students incorporate as many terms from the word list as possible into a story or essay. 
6. **Word Sorts:**
 - Provide categories or themes related to floriculture (e.g., flower types, arrangement styles, tools and materials) and ask students to categorize each term accordingly.
 - Have students group terms based on their similarities or associations.
7. **Crossword Puzzles or Word Searches:**
 - Create crossword puzzles or word searches using terms from the word list and clues or descriptions related to each term.
8. **Discussion Questions:**
 - Pose discussion questions or prompts related to floriculture topics and ask students to incorporate terms from the word list in their responses.
 - Encourage students to discuss their experiences or knowledge related to specific terms from the word list.
9. **Practical Application Tasks:**
 - Assign tasks where students must apply their knowledge of floriculture terms, such as designing a flower arrangement using terms from the word list or identifying different flower types based on their characteristics.
10. **Interactive Games:**
 - Develop interactive games or activities, such as online quizzes, flashcards, or matching games, using terms from the word list to engage students in a fun and interactive way.

These exercises cater to various learning styles and help reinforce students' understanding and retention of floriculture vocabulary in an engaging manner.

Figure 6. ChatGPT's response to the question "What type of exercises can I create using a word list from floriculture?" (generated by ChatGPT in February 2024)

As an example, ChatGPT was asked to “Use 20 terms from the previous list to create 3 vocabulary exercises for students (B1 level of English): one multiple-choice fill in the blanks exercise (Figure 7), one matching exercise (Figure 8) and one vocabulary quiz (Figure 9)”. The choice of terms was: *boutonniere, wrist corsage, cascade bouquet, hand-tied bouquet, floristry knife, mechanics, floral foam, armature, French bouquet, floral tape, garland, centerpiece, topiary arrangement, formal linear arrangement, nosegay, ribboning technique, vintage arrangement, Zen arrangement, cascade arrangement, unity*.

Exercise 1: Multiple-Choice Fill in the Blanks

Instructions: Choose the correct term from the list to complete each sentence.

1. The _____ is a handheld tool used to cut flower stems.
 - A) floral foam
 - B) floristry knife
 - C) flower frog
 - D) bouquet holder

2. A _____ is a decorative ring of flowers worn around the wrist.
 - A) boutonniere
 - B) wrist corsage
 - C) centerpieces
 - D) garlands

3. _____ is a technique where flowers are arranged in a cascading, waterfall-like design.
 - A) Symmetrical arrangement
 - B) Cascade bouquet
 - C) Nosegay
 - D) Table centerpiece

4. _____ are flowers that are evenly distributed and often tied together at the stems in a rounded arrangement.
 - A) Toss bouquet
 - B) Formal linear arrangement
 - C) Hand-tied bouquet
 - D) Topiary arrangement

5. Floral _____ is used to hold flower stems in place in floral arrangements.
 - A) mechanics
 - B) wire cutter
 - C) vase
 - D) ribboning technique



Figure 7. Multiple-choice exercise (generated by ChatGPT in February 2024)

Exercise 2: Matching Exercise

Instructions: Match the term on the left with its corresponding description on the right.

1. Boutonniere a) A handheld tool used for cutting flower stems.
2. Wrist corsage b) A decorative ring of flowers worn around the wrist.
3. Cascade bouquet c) A technique where flowers are arranged in a cascading, waterfall-like design.
4. Hand-tied bouquet d) Flowers that are evenly distributed and often tied together at the stems in a rounded arrangement.
5. Floristry knife e) A small, decorative floral arrangement worn on the lapel of a jacket or suit.

Figure 8. Matching exercise (generated by ChatGPT in February 2024)

Exercise 3: Vocabulary Quiz

Instructions: Write the correct term from the list to match each definition or description.

1. A technique where flowers are arranged in a loose, unstructured manner using unconventional materials like wire frames or found objects.
•

2. A style of arranging flowers that focuses on using a single color or shades of the same color for a unified look.
•

3. A classic, rounded arrangement where flowers are evenly distributed and often tied together at the stems.
•

4. A technique where flowers are arranged in a sweeping, curved shape resembling a crescent moon.
•

5. A free-form style of arranging flowers that mimics the natural landscape, often incorporating elements like rocks, branches, and grasses.
•



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6. A handheld tool used to cut flower stems.

•

7. Floral foam is used to hold flower stems in place in floral arrangements.

•

8. A decorative ring of flowers worn around the wrist.

•

9. A technique where flowers are arranged in a tight, compact cluster, often using a variety of flower types and colors.

•

10. A small, decorative floral arrangement worn on the lapel of a jacket or suit.

•

Figure 9. Vocabulary quiz (generated by ChatGPT in February 2024)

Similarly, a list of specific terms can be used to generate a text that will be the basis of various activities including vocabulary recognition exercises or text comprehension exercises that will further practice the terminology. For example, ChatGPT created the following text and related activity (Figure 10):

Vocabulary Recognition Exercise: Floriculture

Read the following text about floriculture and identify the specialized terms from the word list provided. Circle or highlight each term as you encounter it in the passage.

Floriculture is the art and science of cultivating and arranging flowers and ornamental plants. It encompasses various techniques and practices aimed at growing, harvesting, and arranging flowers for decorative purposes, ceremonies, and celebrations.

One of the key aspects of floriculture is the cultivation of flowers, which involves selecting appropriate plant species, preparing the soil, and providing optimal growing conditions such as adequate sunlight, water, and nutrients. Flowers are cultivated in a variety of settings, including gardens, greenhouses, and nurseries, to ensure their healthy growth and vibrant blooms.

Once flowers are grown and harvested, they are often used in floral arrangements and designs. Floral arrangements can range from simple bouquets to elaborate centerpieces and garlands, each showcasing the beauty and diversity of flowers. Techniques such as hand-tied bouquets, cascade arrangements, and topiary designs are used to create visually stunning compositions that capture the essence of floriculture.

Floriculture also involves the use of specialized tools and materials to aid in the arrangement of flowers. Tools like floristry knives, floral tape, and wire cutters are essential for cutting and shaping flower stems, while materials like floral foam and armatures provide support and structure for floral designs. Additionally, techniques such as ribboning and ribboning technique add decorative accents to floral arrangements, enhancing their visual appeal.

Beyond aesthetics, floriculture plays a significant role in cultural and social events. Flowers are often used to adorn special occasions such as weddings, birthdays, and holidays, symbolizing love, joy, and celebration. Wrist corsages and boutonnieres are popular accessories worn by individuals attending formal events, while centerpieces and garlands adorn tables and venues, creating a festive atmosphere.

In conclusion, floriculture is a multifaceted discipline that combines horticulture, artistry, and cultural significance. It involves the cultivation, arrangement, and use of flowers for decorative purposes, bringing beauty and joy to various occasions and celebrations. With its rich history and diverse techniques, floriculture continues to be a cherished tradition that delights and inspires people around the world.

Figure 10. Text and activity created by ChatGPT for B1-B2 level students. The terms that they are meant to recognize are underlined. (generated by ChatGPT in February 2024)

An important issue that should be mentioned here is the aspect of grammatical category because it is very important for students to understand the difference between and the correct usage of nouns, verbs and adjectives, which pose problems to those with lower levels of language proficiency. The chatbot is very useful in quickly generating word families for specific terms and further vocabulary activities in order to practice the correct usage (Figures 11 and 12).



ChatGPT

The word "pruning" belongs to the following word family:

1. Prune (verb) - to trim or cut away unnecessary or excess parts.
2. Pruned (adjective) - having been subjected to pruning.
3. Pruner (noun) - a person or tool that prunes.
4. Prunings (noun) - the parts that have been pruned away.

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ChatGPT

Certainly! Here's a vocabulary exercise to practice using different forms within the word family of "pruning":

Exercise: Fill in the blanks with the correct form of the word "pruning" (prune, pruned, pruner, prunings).

1. The gardener used a sharp _____ to trim the overgrown branches.
2. Have you ever _____ your fruit trees to encourage better fruit production?
3. After the _____ process, the shrubs looked more neat and well-maintained.
4. Proper _____ techniques can help shape plants and promote healthy growth.
5. She is an expert _____ and knows exactly which branches to remove for optimal plant health.
6. The _____ from the trees were collected and disposed of in the compost bin.
7. It's essential to use clean and sterilized _____ to prevent the spread of diseases between plants.
8. The rose bushes were carefully _____ to remove any dead or diseased stems.
9. The _____ of the hedges allows more sunlight to reach the garden beds below.
10. The annual _____ of the grapevines is necessary to maintain a manageable size and encourage fruit production.

Figure 11. Family word and vocabulary activity for "pruning". (generated by ChatGPT in February 2024)

ChatGPT

The word "fertilize" belongs to the following word family:

1. Fertilize (verb) - to enrich soil or a medium with nutrients to promote plant growth.
2. Fertilization (noun) - the process or act of fertilizing.
3. Fertilizer (noun) - a substance added to soil or plants to increase its fertility.
4. Fertilized (adjective) - having been subjected to fertilization.

ChatGPT

Sure, here's a vocabulary exercise to practice using different forms within the word family of "fertilize":

Exercise: Fill in the blanks with the correct form of the word "fertilize" (fertilize, fertilization, fertilizer, fertilized).

1. Farmers often use _____ to enrich the soil and promote healthy crop growth.
2. After the _____ process, the soil became more nutrient-rich and conducive to plant growth.
3. It is important to choose the right type of _____ for your plants to ensure they receive adequate nutrients.
4. The fields were _____ in preparation for the upcoming planting season.
5. Proper _____ techniques can significantly improve agricultural productivity.
6. The use of organic _____ has become increasingly popular among environmentally-conscious farmers.
7. The _____ of the soil helped the plants thrive in the harsh climate.
8. Have you ever _____ your garden to enhance the growth of your flowers and vegetables?
9. The garden center offers a wide range of _____ options to suit different types of plants and soil conditions.
10. The _____ process is essential for maintaining soil fertility and ensuring successful crop yields.



Figure 12. Family word and vocabulary activity for "fertilize". (generated by ChatGPT in February 2024)

There are certain problems that should be mentioned among the limitations observed during this study. One of them is about the list of 500 terms from floriculture. As illustrated in Figure 13, the list contained indeed 500 terms, in alphabetical order, but it stopped at letter M, which was strange. Therefore, ChatGPT was asked about the other letters of the alphabet: “The previous 500-word list of terms from floriculture stops at letter M. Can you list more important terms from floriculture between letters N-Z?” and it obliged with an additional 77 terms covering the rest of the letters (Figure 14). Thus, the initial list was incomplete and not sufficiently randomized among the letters of the alphabet, and therefore not a guarantee of comprehensiveness or accuracy, even in this limited scope. When prompted again, more specifically this time, in the light of this observation, to regenerate the list of terms from A to Z, its response again stopped at the letter M, the 500th term being the same as before, *measurement* (Figure 15) even though it gave assurance that it would generate a list of 500 terms from floriculture from A to Z, as seen in Figure 15.

477. Longshore
478. Loquat
479. Luffa
480. Lumber
481. Lupine
482. Lysine
483. Macro
484. Magnolia
485. Mallow
486. Management
487. Mandarin
488. Mangrove
489. Manifold
490. Manure
491. Maple
492. Marigold
493. Marjoram
494. Masking
495. Mass
496. Mast
497. Matchstick
498. Maturation
499. Mayapple
500. Measurement



This list covers a variety of terms relevant to floriculture, including those related to plant biology,

Figure 13. ChatGPT’s list of 500 terms from floriculture stopping at letter M (generated by ChatGPT in February 2024)

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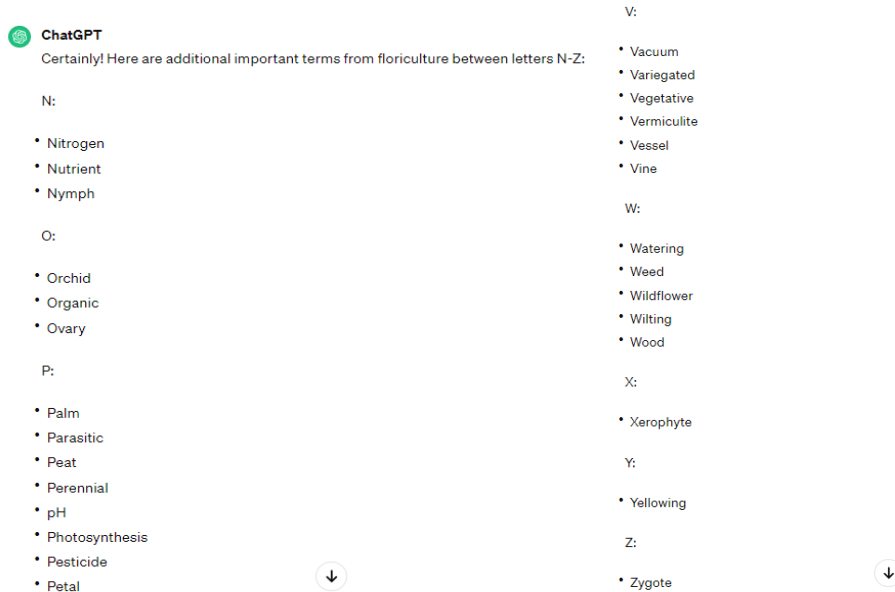


Figure 14. ChatGPT’s addition to the list of 500 terms from floriculture that initially stopped at letter M (selection from response generated by ChatGPT in February 2024)

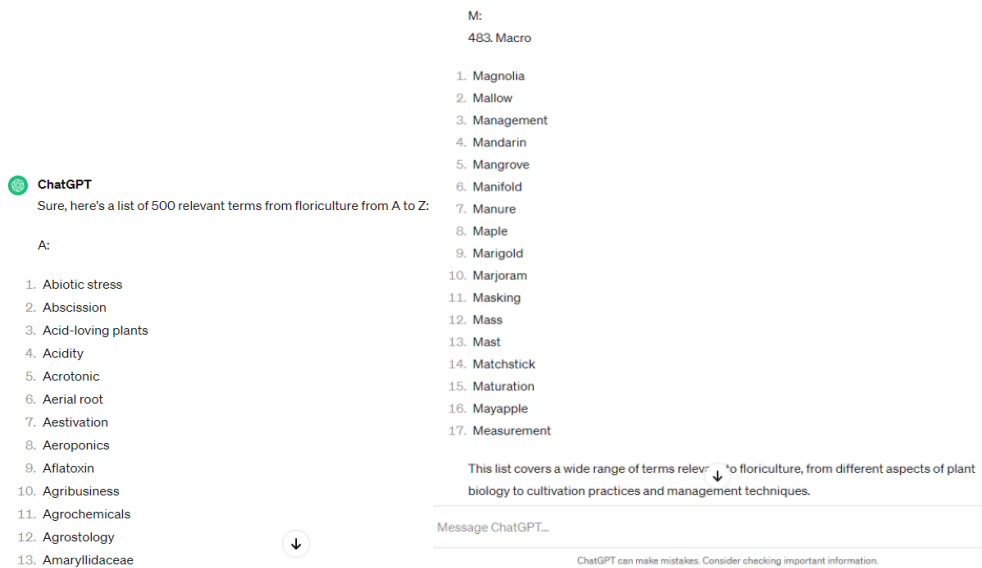


Figure 15. ChatGPT’s regeneration of the list, again stopping at the letter M (selection, beginning and end, from response generated by ChatGPT in February 2024)

Another problematic issue is related to the grammatical categories mentioned earlier. At a first glance, these lists of terms generated by ChatGPT are biased towards nouns, which is not uncommon, therefore, the chatbot was asked to analyze the initial list of 500 terms from floriculture and determine how many nouns, verbs and adjectives it contains. The result was: Nouns: 419; Verbs: 19; Adjectives: 62. Given this result, the chatbot was further asked to list the actual verbs and adjectives, since they are so few, compared to the nouns. Unfortunately, certain problems were noticed again. The verbs, although correct, were lacking. Some very common verbs in this field were not suggested by ChatGPT. However, they might be inferred as part of the word family from the large amount of nouns present in the list. Also, another solution would be to simply ask the chatbot to list specifically one grammatical category, only verbs, for example. More problematic still was the list of adjectives as only those from A to D were extracted. The second problem was that it included nouns although the request was specifically for adjectives only. After it was pointed out the following: "Armillaria, Bedrock, Biomass, Botrytis, Chamomile, Chrysanthemum, Cilantro, Corolla, Cowslip and others are not adjectives. They are nouns! You are wrong...", the chatbot apologized and regenerated the list, without nouns, but again incomplete, only from E to H this time. There is no perceived reason or understanding why this happens but it is clearly an issue and we must be careful of the information it generates in view of our request as well as how complete it is for our purposes.

Conclusion

This experience with ChatGPT and the study conducted specifically for this article largely matched the experience of other researchers discussed in literature review in terms of using the AI chatbot for language teaching in general, and more specifically for generating ESP teaching materials. These AI-generated materials must still go through a verification, but the advantages remain in that the adaptation stage is largely eliminated, the texts are well structured and the chatbot can further create follow-up activities. The texts are generated within the teacher's specific parameters (length and language proficiency level), on a particular topic and using specific terminology, which is likely the most important advantage for an ESP teacher. When the level of specialization is not too high the reliance problem, which is a concern for researchers discussed in previous sections, is considerably reduced. This happens when the students have a lower level of language proficiency. We cannot use too highly specialized texts when the students cannot properly understand general English. Therefore, the specialized terminology will be

introduced through general topics related to their particular program. This also ensures the reliability to a large degree of the information provided by the chatbot. Texts generated about general topics within a specialization will basically present a summary of the issue, will not use complicated sentences or terminology, but will offer the basics in terms of both information and specialized vocabulary which will help the students acquire a reasonable amount of fundamental terminology without being daunted by its difficulty. Targeted and detailed prompts, as well as providing the chatbot with specific terms to be used will ensure the best results in reference to our expectations.

Another important advantage for ESP teachers is that ChatGPT can assist in creating specialized word lists tailored to specific ESP domains, thus overcoming the limitations of available glossaries. The chatbot can further organize word lists into categories and subcategories, as we require, enabling structured vocabulary activities that cover different aspects of the domain. It can create such glossaries, complete with definitions, as well as subsequent activities to practice that particular terminology, and texts using a selection of terms we require. Within the word lists created by the chatbot, we can also ask it to distinguish between grammatical categories and create specific activities for a better understanding of their usage, especially by students with intermediate or lower level of English proficiency.

There are, however, certain shortcomings noticed specifically from this experience of generating ESP teaching materials in the form of texts and word lists. The most important one is unreliability. As already discussed in detail in previous sections, the comprehensiveness and organization of the word lists generated by ChatGPT are problematic. Also, there are issues with the distinction between grammatical categories because even when specifically requested, the chatbot struggled to provide a balanced distribution of grammatical categories, often including nouns in the list of adjectives. Common verbs in the field were sometimes missing from the suggestions, reducing the accuracy and usefulness of the generated materials. These limitations highlight the need for caution and verification when relying on ChatGPT to ensure the accuracy and completeness of ESP teaching materials.

Further studies should continue to analyze how future updated versions of the chatbot will improve its usefulness in generating better ESP materials, especially for less studied areas of ESP where there is a dire need for relevant and efficient teaching materials. The conclusion is to take advantage of these technologies and use ChatGPT because it can save time and produce a wide variety of good teaching materials for general ESP topics using specialized terminologies, but treat with caution, verify and formulate precise prompts because, at this point in time, the chatbot still has limitations, and there can be

misinformation and errors hidden in the information it provides. However, like any AI model, ChatGPT is an ever-evolving “organism”, it continually improves, it is periodically updated and the reliability factor will most likely increase in time.

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