



**ChatGPT and its Impact on Students' Cognitive Abilities  
and Language Development in the Swedish EFL Classroom**

A qualitative study of English 5 students in upper secondary education

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## **Abstract**

The purpose of this study is to explore the possibilities that the highly popular ChatGPT utility might have on education, and more specifically, how it could impact language development in the Swedish EFL classroom. This will be attained through a qualitative method and through multiple observations in real-life situations with students from upper secondary school.

Additionally, for a more profound analysis this will then be combined with follow-up interviews with two educating teachers. The observations presented mixed results with some students displaying positive feelings towards ChatGPT while others reacted negatively to its extensive replies to simple inquiries. This proved to be valuable empirical data for this study's analysis.

Therefore, this study has concluded that ChatGPT as a didactic tool, should be used in a controlled situation, and explained thoroughly with a specific intentional purpose. In other words, ChatGPT could be used in different teaching situations to enforce students' abilities or to ease the cognitive burden that many students experience when writing texts, as can be explained by cognitive load theory (Sweller, 1988, p. 277). If the messages from the text-generator are clear, informative, personal, and concise it could be used to aid students in their writing process. However, the different complications that arise with the use of ChatGPT including a negative effect on student self-esteem must be considered.

Keywords: Artificial Intelligence, ChatGPT, Chatbot, Cognitive Load Theory, Feedback, Individual Language Development

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## 1 Introduction

The future draws ever closer as has become clear during the last couple of years as new innovative technological marvels keep appearing at a rapid pace, and society changes as a result of it. For this reason, it is without a doubt tremendously important to be able to adapt to these changes. Interestingly, the demands of digital competence are on the rise as reported by Mörtberg (2020) as requested by the Swedish Public Employment Service (p.7). Therefore, the educational system needs to prepare students and properly equip them with necessary abilities in order to meet requirements from the labour market. This would include skills such as being able to handle modern technology with ease, and to swiftly relearn when updates occur. Naturally, this has been the case for some time, as the still active curriculum LGY11, emphasises in numerous ways the importance of students acquiring digital competence as a part of their education (SKOLFS 2011:144, p. 3). This would eventually make it possible for students to be ready to adapt to a changing digital work environment and strengthen the students' lifelong desire to learn as the curriculum states (SKOLFS 2011:144, p. 3).

Improving education through the innumerable technological innovations that might seem interesting, motivating and eventful in order to efficiently develop the necessary skills in the English language can be of great importance. However, new digital innovations are not always wanted or desired in the classroom, and in some instances they can even be counter-productive to the education as a whole. In the eyes of an educating English teacher, it is crucial to implement at least some digital parts into their lesson planning as students learn differently as stated by the English 5 syllabus (SKOLFS 2010:261, p. 3). In modern society, students experience the English language on their own in the digital world in a myriad of ways; this ranges from interacting with others online through social media, video games or watching movies and listening to music. In other words, the English language is all around us and is consumed more than ever. This is acknowledged by the Swedish National Agency for Education (2022) who recognise the fact that students' personal experiences, skills and interests have immense value in order to further their education as stated in their own commentary material in which they emphasise important aspects (p. 10). This is something that educating teachers need to abide by, as it might incentivise students to see the important value in fully understanding and being able to communicate and comprehend the English language efficiently.

As of this moment, a new challenge for educators has arisen, and that is the ever-growing popular digital phenomenon known as the artificial intelligence *OpenAI ChatGPT* software. This tool is fascinating for its fast-growing popularity in not only the general public, but in multiple professional fields that have opted to use this tool as a way of profoundly increasing productivity (Noy and Zhang, 2023, p. 1). However, this software seems to have partly created a problematic situation in the educational field, with students deciding to use it for the purpose of cheating in different ways.

In this essay, we will investigate, analyse and discuss in what ways this text-generating software could be adopted for advantageous purposes in the upper secondary EFL classroom. This will be made possible through a qualitative method that aims to observe students in a realistic environment where they actually use the tool intended to develop their English skills. Continuously, we will present our findings and discuss the usefulness of ChatGPT in an educational situation. This will be done by integrating previous modern research made in technology that further explores the specifics of artificial intelligence. Moreover, previous research in neuroscience that specifically focuses on cognitive research and pedagogy will provide an in-depth understanding on how ChatGPT can, in theory, act as a supporting tool as students are struggling to attain knowledge. Furthermore, we will contrast and compare this study's discoveries with similar studies, and from that summarise a concluding resolution on how ChatGPT should be used as a resourceful digital tool to be used for educational purposes, and what to avoid. Finally, our discoveries will be accompanied with follow-up interviews where two experienced teachers share their thoughts if ChatGPT could be introduced successfully in an English language classroom environment or not.

## **1.1 Historical background**

For the last couple of decades, the educational field has struggled to keep up with the ever-growing technological advancements that indeed have made an impact on global society. Continuously, the educators are refreshing their curriculum in order to make the content authentic, meaningful and to be able to meet the workforce's demands for high digital competence to efficiently handle work with the latest technological tools in various industries. Therefore, it has more or less become essential for students to be able to in an efficient way

understand and be comfortable to use various digital and tech-based hardware as well as different kinds of software.

Digitalisation of the education system has become essential in Swedish schools and has been discussed, celebrated and criticised as some believe that printed physical textbooks are preferable (Grace, 2023). However, the use of digital tools as part of the curriculum is of immense importance in order to prepare the young generation and provide them with the necessary digital expertise. This will be required in order to strengthen students' curiosity and their lifelong pursuit of knowledge, as stated in the curriculum (SKOLFS 2011:144, p. 1).

The curriculum written in 1980 for Swedish schools (Lgr 80) affirms that people surround themselves with more technological tools; therefore, it is of importance to adhere to the required knowledge to operate and benefits those tools have to offer (p. 18). The curriculum from 1994 (Lpo 94) proclaimed that all students should know and understand basic technical knowledge (p. 10). The Swedish National Agency states in the curriculum created in 2011 (Lgy 11) that students should be able to navigate in an ever-growing globalised world with a large flow of information and digitalisation (p. 3). This would mean that the curriculum has changed consistently to incorporate technology over time.

Digitalisation in education, however, is not always without its challenges, and should not be taken for granted. As a matter of fact, Kay (1991) suggested that computers are not a remedy for a weak and unfruitful curriculum that fails to develop students' abilities. Moreover, Kay (1991) states that learning and student development could easily be done without any involvement of computers at all (p. 9). Incorporating technology was not always viewed as a positive and even during the technological boom of the late 20th century it was sometimes deemed to be redundant.

The positive voices for computers focused on the adaptability and the impact computers had on education. Ely (1993) concurs that where computers have been effectively implemented in schools by teachers as well as students, the effects have been tremendous, resulting in a new set of skills and a fresh outlook on learning (p. 55). Moreover, the usage of computers in the classroom as pointed out by Garrett (1991), who studied the impact of technologies on modern language and linguistics, provides opportunities for students with vocabulary, grammar and competitive activities. This, as argued by Garrett (1991), offers solutions that teachers face in the classroom. Interestingly, Garrett (1991) explains that digital activities could aid students with

specific problems and give individual tutorials depending on the student's assignment, this optimises the learning process as the teacher might be unable to help due to lack of time or being occupied with helping other students in the class (p. 79).

One huge downside regarding investments of computers was that they were considered to be unnecessary and expensive. Moskovitz and Birman (1985) concur that certain school districts in the United States invested over half a million dollars to incorporate technology, despite tight budgets (p. 11). Funds spent on computers could be regarded as unnecessary due to the tight budgets and could have been used more effectively. While it may be possible to explain the investment post factum, it was unprecedented spending that could possibly be invested in areas that were more beneficial. Moskovitz and Birman (1985) conclude that the sampled districts did accomplish an acceptable digital literacy that would benefit the students (p. 14). In Sweden, approximately five billion SEK was invested during the latter half of the 1990's, in order to make sure schools were properly equipped with computers and other necessary digital tools. However, those resources were deemed unequally distributed (Broady et al. 2000, p. vi).

Technology has been supplied in schools for a long time and is second nature for most students today. However, there exists a new notion that Swedish schools should, and will, use less technology and instead prioritise physical books more than was done in previous years. According to Grace (2023), Swedish schools are putting a stronger emphasis on handwriting and using printed textbooks to restore learning without computers.

Time progresses and as technology evolves so do the ways in which teachers perform their duties in the classroom. With the growing interest in artificial intelligence, the European Commission (2022) has composed some ethical guidelines for educating teachers to consider, stating among other things that AI does indeed have potential in the field of education. However, they highlight the importance of being aware of not only the possibilities AI could offer, but to also be mindful of the risks (p. 28).

The discourse regarding artificial intelligence is separated into two opposing sides. One is fairly pessimistic and regards it as a possible harm to academic integrity, whilst the other perceives it as a possibility to optimise the cognitive learning process of students (Essel et al. 2023, p. 10). While it may seem questionable to incorporate new technology there is a possibility, as mentioned above, to use technology effectively. However, it is hard to predict what the effects may be as technology is continuously evolving.

This study will highlight and discuss an example of how schools could use ChatGPT to further education and thus achieve new cognitive skills for students, such as critical, reflective and creative thinking skills. While some may be hopeful for the incorporation of new digital tools, it may be beneficial to perform the implementation of digital tools much like what was done when computers entered the schools. The Swedish National Agency of Education presents a course for students of upper secondary school that regards artificial intelligence and how it could be used. Teachers are able to study the subject during higher education and thus it will be available for students at the start of the fall term 2024 (2023). The availability of the course could be interpreted as something positive from the National Agency to encourage the usage of artificial intelligence, as it is a preparation for a future where being able to effectively use ChatGPT could be useful and perhaps even a necessity.

## **2 Literature review**

The amount of research in the field of artificial intelligence is extensive, probably due to its increase in popularity in not only pedagogical research but other areas as well. Because of this, in order to stay within this study's restrictive framework, the selected research has been narrowed down to mainly surround the educational field. Furthermore, the previous research could be described as cross-sectional, featuring areas within pedagogy, psychology, neuroscience, data-engineering and linguistics.

Technology has become a crucial part of modern society and therefore it is vital that it is utilised in education. Interestingly, as mentioned above, there is an ongoing debate if technology is negatively affecting the young generation in the modern classroom, and that technical equipment should be limited. In this section of the essay, previous research that is of relevance to this study will be put forward. This research presents, in various ways, how students' language development is being affected when digital tools are implemented in their education.

Additionally, the research that will be discussed brings attention to the fact that technology could enhance the learning experience for students in the EFL classroom. Naturally, digital activities and advanced technological tools should aim to provide students with opportunities to develop digital competence that in the end could facilitate knowledge (SKOLFS 2011:144, p. 7).

However, little is known of the benefits that artificial intelligence is capable of providing in the English classroom for upper secondary education. Despite this, there are some research projects



that have investigated in different ways if and how AI can in a positive way enrich the learning process, although with mixed results and these will be discussed below.

## **2.1 Computer Assisted Language Learning**

Computer assisted language learning (CALL) refers to the pedagogical design approach that optimises instructions in order to make language learning more effective through technology. In other words, any form of technology that could be used as a resource to engage with and get access to literacy and information, could be used in order to promote language development, and make the learning process more effective (Chen et al. 2021, p. 152). CALL is the interaction between a language learner and various technology and digital software systems that could incentivise and promote knowledge. Additionally, by promoting a relationship with an L2 learner and technology this would create motivation as the knowledge being made is considered useful for other purposes than the world of academia. CALL-based teaching can encourage language education to be acknowledged as something valuable, necessary and perceived as useful (Chen et al. 2021, p. 152).

Over the course of several years, there have been countless digital writing programs such as Word, Pages and Google Docs that have seen the light of day, many of them having a preconstructed vocabulary database and a grammatical competence with the ability to aid the user. This has been perceived as invaluable for learning purposes as its main functions are to detect and then correct errors in a text. This type of feedback is tremendously beneficial for the learning process because it is instantaneous, as explained by Shadiev and Feng (2023, p. 1). Whilst this CALL technology is not groundbreaking today by any means, the auto correction tool could also be found in ChatGPT as it is capable of continuously learning new information, as will be explained later.

Artificial intelligence may be the latest technological advancement in our society that has raised interest as well as concerns (Giannini, 2023, p. 4-5). Nevertheless, society has become more digitised than ever, naturally the pedagogical field has incorporated technology in education as a result. Nowadays, it is not unusual for the young generation to perform their daily academic assignments on computers, tablets or even their cellphones. CALL has become a normalised didactic approach to develop knowledge in various instances. In order to make full usage of these devices, there are multiple digital software available that would provide aid, and

personalised tutoring to students. Admittedly, the young generation has great interest in and curiosity for this new artificial intelligence, and teenagers are more likely to have used ChatGPT in order to receive assistance with various kinds of schoolwork, as reported by Carter (2023), and Sidoti and Gottfried (2023).

It is through authentic materials that not only students' motivation to participate is raised as argued by Henry and Lamb (2019), but also their language development is strengthened. In addition, through the usage of activities in a digital environment, students can perceive the assignments as valuable as they often react positively when they get the opportunity to develop their language abilities by means of utilising digital tools (p. 599). Arguably, CALL can include many different kinds of technology and perhaps ChatGPT could be perceived as a new addition to CALL as AI is indeed a new form of assistant with access to information available online. In addition, this text-generative assistant can undertake the supportive role of a nonexistent peer in order to increase language input as well as output for the L2 learner (Jeon, 2022, p. 20). Furthermore, while this newfound chatbot technology is able to fill the empty void of partners to interact with, it could provide useful and immediate feedback to further improve the L2 user's lingual abilities as recognised by multiple research projects (Karthikeyan, 2023, p. 285; Jeon, 2023, p. 1359). Moreover, Henry and Lamb (2019) continuously emphasise that there are numerous reasons to make use of digital tools in order to develop language abilities. In addition, Henry and Lamb (2019) emphasises that teachers who opt for digital activities and exploit new technology would not only enhance the learning process but also encourage learner autonomy (p. 603). Furthermore, in order to further strengthen learner autonomy, digital tools could generate immediate personalised feedback, as stated by Henry and Lamb (2019, p. 602). This could, in theory, encourage the learner to reflect on their development and incentivise them to keep practice and with that their self-esteem is greatly increased.

Language is a social activity, and the best way to improve is through interaction with an interlocutor (Lundahl, 2021, p. 139). Increasing the amount of English exposure is crucial, that includes both input as well as output, through social interaction. Arguably, digital tools make this easier than ever, and with the option to use ChatGPT as an interactive partner, the potential is almost endless. In relation to this, research put forward by Jeon (2023), who conducted a study about artificial intelligence-based chatbots similar to ChatGPT, concluded that they provide effective conditions for learners to develop and increase their vocabulary (p. 1359). Moreover, as

chatbots can mimic human-like interactions, they have a promising future as they can be used on multiple devices (Jeon, 2023, p. 1360). Ultimately, ChatGPT could become as accessible as any search engine that is available today, with the capacity to find information on any kind of subject.

## **2.2 Feedback in education**

In this section, we will showcase relevant research that further explains feedback and some general information of its importance in education, specifically feedback in the EFL classroom and how it can be presented by artificial intelligence. Moreover, new research that has acted as inspiration to this essay's topic will be presented and briefly discussed.

### **2.2.1 Previous pedagogical research on the effects of Feedback**

Feedback could be regarded as rewarding from a psychological point of view. In Kluger and Denisi's (1996) study, they researched the effect of feedback and its importance to any L2 learners' performance and continuous development in the English language (p. 277). Hyland and Hyland (2006) highlight the fact that feedback is of uttermost importance in the education of L2 learners' writing abilities (p. 84). However, despite being useful, feedback can result in frustration in students. The reason for this is that feedback might not accurately comment on specific written errors that need to be brought to the learners' attention in order for them to continue to develop their lingual skills, as mentioned by Hyland and Hyland (2006, p. 84). Ideally, teachers provide feedback on multiple occasions both *indirect feedback* that simply says an error has been made and *direct feedback* in order to highlight how to correct the error. This could be provided both orally in a formative way as well as in written form to bring the frequent errors to the students' attention. However, as argued by Hyland and Hyland (2006), there might be issues when students fail to recognise the importance of corrective feedback and they might even risk being offended by feedback and avoid the issue altogether (p. 87). Interestingly, research conducted by Liang et al. (2023) concluded in their study on corrective feedback, that when L2 learners interacted with an AI-based software it impacted the overall learning experience. Through chat conversations, the AI assistant gave individual instructions in order for students to improve their writing abilities such as accuracy, clarity and even level of formality. This could actually serve as an example of how artificial intelligence can provide a modern

perspective on how feedback can be provided for self-reflective purposes, and could act as a secondary opinion apart from the teacher's (p. 83).

### **2.2.2 Modern research on Feedback created by artificial intelligence**

In the modern age of technology, time is perceived as valuable, and Liang et al. (2023) concluded in their studies that educators could free up time by means of using what they refer to as automated corrective feedback, artificially created by an AI. By applying ChatGPT or similar text-generating software, teachers could, through specific instructions, be able to continuously provide real-time feedback that otherwise would be exceedingly time-consuming (p. 84). Ultimately, in theory, this would provide a myriad of opportunities for students to become more self-aware of their deficiencies and further improve themselves individually, as argued by Liang et al. (2023, p. 84). According to the same study, there might be some challenges if students with limited proficiency have difficulties understanding the feedback given by a chatbot, as explained in detail by Liang et al. (2023, p. 91). Despite this, by using automated feedback provided by artificial intelligence, this could create new possibilities in the EFL classroom. One example would be to create a situation where AI provides the students with immediate feedback, and if needed, this could be further explained through scaffolding from a fellow student or the teacher.

### **2.3 ChatGPT**

ChatGPT, is a website-based tool with the purpose to generate human-like responses and outputs in the form of various texts. In turn, these texts originate from information that is available on multiple sources found online. According to Kalla et al. (2023), the software itself is created through a neural network that is designed to process data and text in accordance with users' requests. After processing, ChatGPT is capable of generating responses and solutions to any kind of request the user might have. To simplify: the user inserts an explicit instruction, more commonly referred to as a *prompt*. In merely a couple of seconds, ChatGPT processes this prompt, and then a response is given to the user instantly. Should a response for any reason be deemed unsatisfactory, you could simply add additional information or give further instructions in order to achieve the desired result (Ibrahim, 2023, p. 1).

This text-generating artificial intelligence, as the name implies, is continuously learning to improve itself through interaction with over 180 million users worldwide (Ibrahim, 2023, p. 4;

Tong, 2023). Interestingly, despite being incorrect about some topics at times, it is growing more capable with every individual interaction through its users. ChatGPT as a text-generating digital tool, has proven to be capable of improving workers' efficiency in producing lengthy, formal and industry-specific language usage in various office environments.

The web-based digital assistant is not without flaws, however, as research conducted by Kalla et al. (2023) confirms that there is the possibility for bias from the program, indicating that it is less trustworthy. However, that is not the only possible disadvantage as there is a lack of emotional intelligence from the program, thus missing emotional cues. ChatGPT learns by interacting with users, thus, certain prompts might be incorrect and require additional sources. However, there are also advantages to ChatGPT, the ability to generate human-like responses quickly, while creating numerous other conversations allows the program to be fast when responding and not stutter while using it. Moreover, one advantage is the adaptability, making it viable for many different purposes as explained by Bai et al. (2023, p. 6-7).

Kalla et al. (2023) state that ChatGPT may be revolutionary for academics due to the ability to help students understand concepts through customised explanations that are individual for each student. Moreover, it can give individual feedback to further support students, as will be more thoroughly explained in this study's result section. In relation to this, Kwan Lo (2023) argues that students can use ChatGPT as a scaffolding tool to correct and finalise drafts for assignments (p. 7). Furthermore, Kalla et al. (2023) agree and similarly argue that teachers can use ChatGPT to grade assignments, and give students feedback, this would save time for the teachers, allowing them to more efficiently help students.

### **2.3.1 Enabling new ways of cheating**

There is presumably resistance towards ChatGPT in the field of pedagogy, as it has created new opportunities for cheating. As a matter of fact, Cotton et al. (2023) state that there are challenges that are presented while incorporating ChatGPT in school. One way that students can use it as a tool for cheating consists of not stating that it was written by AI, or even that certain portions of their work are plagiarised. This can be damaging to the quality of education provided, but Cotton et al. (2023) state that there are methods that can be implemented to avoid cheating. They state that it is important to educate students about plagiarism, as it will be beneficial to present draft hand-ins from the students before the assignment is completed. There is also a possibility to use

AI detection tools that can inform the teachers that an assignment may be written by ChatGPT. It is of interest to set clear guidelines for the students and monitor them closely to limit the opportunity to use ChatGPT as a tool for cheating (Cotton et al. 2023, p. 4). Additionally, it is important for the teacher to be watchful regarding originality, continuity errors, factual errors, grammatical errors and to analyse the text regarding the level at which it is written (Cotton et al. 2023, p. 5).

Recently, concerns about plagiarism in higher education are raised by Ibrahim (2023), as he discusses the fact that authentic assessment might be in jeopardy as it is especially difficult to distinguish if a text is generated by ChatGPT or a human being (p. 5). However, ChatGPT should not be interpreted as a cataclysmic invention that inevitably will be the doom of education in any way, as there are multiple digital tools available that could detect AI produced content in a text, some being fairly effective as concluded by Ibrahim (2023, p. 24).

### **2.3.2 Resource for individual learning**

ChatGPT can be considered as problematic, and it should therefore be used with prudence. As mentioned above, Kalla et al. (2023), for instance, conclude their study by explaining how the chatbot might be revolutionary for academics due to the ability to give personalised feedback to students. While it may be used to increase the ability to cheat, it may also be included in education to further provide the students with clarity and knowledge. The aforementioned advantages of ChatGPT could be incorporated with the students creating a proper usage that limits the plagiarism that may be an issue and rather implement the program as a possible tool for learning. Kalla et al. (2023) state that ChatGPT has limited knowledge and therefore should be combined with other sources of information. While it may consume some time for the student to include other sources, it could be beneficial for them to further their knowledge.

As will be discussed in more detail in the next part, there is a possibility to limit students' cognitive load, in order to make sure that students are not overwhelmed and ensure their concentration on the crucial aspect of the assignment. Limiting the cognitive load could increase the ability for students to expand their learning, and also their willingness to learn. This could, in theory, be made possible by optimising the students' effective work memory. In order to make this possible, explicit instructions need to be delivered through means of scaffolding.

Interestingly, researchers have found out that ChatGPT could in fact, despite its limitations, bear

the responsibility of a scaffolding partner, if used correctly (Bai et al. 2023, p. 5; Essel et al. 2023, p. 9). Additionally, Essel et al. (2023) concluded in their study that ChatGPT could be used to further increase students' cognitive thinking skills such as critical, reflective, and creative thinking skills by implementing ChatGPT as a digital tool in a learning activity (p. 10). Their experimental study demonstrated that artificial intelligence can act as a scaffolding partner in order to improve the learning process for students on a personal level. This was definitely the case in other studies that in different ways investigated how language development could be optimised, by using AI for educational purposes.

On another note, according to conclusions made by Jeon (2022), there is a possibility that students' intrinsic motivation is raised if a chatbot could be perceived as a valuable resource (p. 19). In other words, if for any reason a teacher has either a positive or a negative mindset towards the usage of chatbots, it could directly influence their students' attitude towards it. If promoted as valuable and useful for individual development, then students' willingness to interact with the AI could increase. Furthermore, it might be important to have discussions with students about the possible limitations that an artificial intelligence based tool might have, as discussed by Jeon (2021, p. 19). This would, in turn, create a situation where students individually realise that they need to be careful not to blindly trust everything that the chatbot tells them, which in turn develops their critical thinking skills.

In relation to individual language improvement, an experimental study conducted by Song and Song (2023) investigated how ChatGPT could impact students' writing skills and it concluded that each student had constructed an individual learning opportunity through their interaction with ChatGPT (p. 3). They concluded that ChatGPT created a zone of proximal development on an individual level that would not have been easily mimicked without the involvement of the AI. In addition, their study indicated that some students became more self-aware to not be overly reliant on the suggestions (p. 10). Interestingly, this would suggest that some students indeed reflect on their own capabilities and interpret ChatGPT as a peer that provides ideas of formulating oneself differently.

To summarise, the previous research surrounding the field of artificial intelligence has different outcomes of how ChatGPT can affect student's language development. Some raise concerns about new ways of cheating, whilst others promote AI as an alternative to optimise the zone of proximal development. Also, on the matter of formative assessment, ChatGPT as

previously stated, can provide its users with immediate feedback which in turn could raise awareness about an L2 learner's errors.

### **3 Theory**

It is not always an easy task to manage multiple thoughts simultaneously, some might even be overwhelmed and struggle with even a simple task. From a general perspective, students might feel confused by the complexity of a task that has been given to them, and as a result their performance could be affected in areas such as accuracy, fluency and coherence. This could be further explained through the theory *Cognitive Load Theory*, a concept that was originally pioneered by the Australian educational psychologist John Sweller back in 1988, and was originally intended as a theoretical approach to problem-solving. This theory explains how information is processed, understood and remembered by someone.

#### **3.1 Cognitive Load Theory**

When processing new information, it is especially important that the instructions provided are made comprehensible to the recipient. When learning a new skill, or understanding a new concept, the human mind is utilising its so called working memory, and connecting new knowledge to some previous knowledge that the individual already possesses. In the long run, this will eventually be stored in the so-called long-term memory for future usage (Sweller, 1988, p. 278). However, depending on the individual's cognitive burden the information could be lost and completely forgotten. This is all explained by Lovell (2020) who further explains that the human working memory's capacity is limiting our way of learning; he declares that “Working memory is the bottleneck of our thinking” (p. 19). In other words, when someone reaches their top capacity of thinking, which could result in feelings of confusion or even frustration. This is especially the case when trying to remember some crucial information found in a text but immediately forgetting important details.

Lovell (2020) further explains that when new information is being processed, considerably more effort is required. In other words, learning something new is difficult, and can prove to be a challenge to our brain from a cognitive point of view. With that said, Merriënboer et al. (2003, p. 6) are suggesting that exposure to unnecessary and excessive information could



be reduced, and instead increase the most important aspect in order to maximise the learning process if scaffolding is adopted into the learning process. Because of this, it is essentially crucial for any educating teacher to limit the cognitive load of information during any learning activity. In the case of English as a second language, a learning activity in the classroom might consist of several aspects, all important for the L2 learner. When a lesson plan is aiming to teach students several things, there might be some difficulties as it could be too much information to process at once. In upper secondary education, it is not uncommon to focus on topics such as social phenomena, expanding students' vocabulary whilst simultaneously practising grammatical forms. This could then be categorised as a main task, a secondary task, and even a tertiary task all summarised into one large and complicated task. In the end, the consequence of this could be that a learner is overwhelmed by the entirety of a task such as this, and might not have enough cognitive resources available to successfully complete the task(s) as explained by Sweller (1988) who discusses a similar example (p.277).

In closer relation to this essay's topic of artificial intelligence, there is a specific study that was recently published by Essel et al. (2023), who specialises in educational innovations in science and technology. In their research, they concluded that artificial intelligence-based software could have a positive impact on students' cognitive skills through implementation of ChatGPT as a part of various class activities. The result showed that students' critical, reflective and creative thinking skills were greatly enhanced (p. 9). The reason for this was that ChatGPT acted as an individualised tutor for each student, providing students with personal feedback and quick explanations ensuring students understood the specific subject, as previously discussed. In addition, students who tend to struggle with these cognitive demanding skills such as critical and reflective thinking skills might be overwhelmed because of limitations of the working memory. Interestingly, Essel et al. (2023) concurs that ChatGPT could act as an assistant that, in theory, could optimise the students' mental capacity (p. 9-10). This would indicate that ChatGPT can be used to adapt the theory of cognitive load theory to make a complicated task easier to undertake for a student. This will especially be kept in consideration as this study undertakes a similar situation to observe the behaviour of students in upper secondary education as they interact with ChatGPT during a learning situation; this will be more elaborated in this essay's result section.

Advanced computer software such as ChatGPT could in theory act as a pillar of support to students who are struggling to develop their language capabilities in the English classroom.

However, there are some pitfalls that educators should be aware of when applying it in practice, and it is also necessary to have a basic understanding of what this text-generating software is capable of and at least not forget its limitations as well. Educating teachers should before deciding to make use of ChatGPT in their teaching be aware of what might come of it. This new technological tool might seem advantageous in an educational environment. However, there are some considerations to be aware of, for example, if ChatGPT is used incorrectly it could have dire consequences for language development (e.g., see Jeon 2023, p.1359; Karthikeyan 2023, p.285; Liang et al. 2023, p.91; Song & Song 2023, p.11).

#### **4 Aim and research questions**

The main purpose and aim of this thesis is to investigate in what way artificial intelligence can have an impact on the language development for students in the course English 5 for upper secondary education. This was concentrated, and limited to the development of students' writing skills. Additionally, our research will specifically study in what ways ChatGPT could be used to develop, train and encourage L2 English students' writing abilities, by optimising their cognitive abilities. In order to meet this study's aim, the research questions were formulated as follows:

1. How can AI be used efficiently to further enhance the language development in the EFL classroom, and what advantages as well as disadvantages are there?
2. How can AI be integrated in the EFL classroom in order to ease the cognitive burden of students, and act as a scaffolding partner?
3. Is it possible to make use of AI in order to raise students' awareness of their individual errors, through feedback generated by ChatGPT?

#### **5 Method and Ethical Considerations**

In order to meet this study's aim and answer the research questions stated above, our study will be conducted through means of a qualitative method that consists of mainly two parts. Firstly, in order to investigate the effectiveness of artificial intelligence in the EFL classroom environment, an observational method was applied, the reason being to observe a realistic teaching situation where students are interacting with ChatGPT. The main focus of our observation was on

examining the possibilities of making students use artificial intelligence in a meaningful situation, other than using it for cheating. This includes making use of ChatGPT individually, in order to receive personalised feedback about common errors in the students' writing abilities. Secondly, in order to voice the opinion of the educating teachers with several years of experience, we seek to weigh in their views.

## **5.1 Qualitative method**

The reason for opting for a qualitative observational research method is to study and see directly in an authentic pedagogical situation how artificial intelligence influences the learning process in any way. In contrast to hearing students' thoughts about artificial intelligence in the form of a quantitative questionnaire, it is our understanding that students' reactions to an authentic educational activity would be more eventful and more genuine, as discussed by Dörnyei (2007, p. 185). It is this study's ambition to get an insight into if there are any advantages to implement ChatGPT in an upper secondary educational environment. Additionally, the findings from the observations will later be discussed in the post-observational follow-up interviews where the educating teachers share their thoughts on artificial intelligence and its broad potentials and risks.

Consistently during each observation, the main objective was divided between the two authors. This was done by simply splitting the students into two groups, with an educating teacher assigned to each group. As researching observers, our role was not to interfere with the lesson in any way, and this was in detail explained to all students prior to the actual lesson starting. This made it possible for each individual researcher to observe students in a smaller group and study students individually. However, after a discussion with the two educating teachers regarding the pre-existing lesson plan, ChatGPT was implemented in a way that could be applicable for students. It is of importance to note that the researchers were not participating in creating the lesson plan, but did, however, provide suggestions of various activities.

Our most interesting findings were later compared, contrasted and discussed together and then analysed, by combining both researchers' notes from the observations. The main target for the observation was, in regards to the aim of this study, how students' awareness of their respective writing deficiencies was affected through the usage of ChatGPT. Furthermore, students' reactions to ChatGPT's feedback, and finally, their willingness to interact with an AI was also observed and analysed.

### 5.1.1 Observational studies

The lesson plan that this study's observation was focused on mainly consisted of two parts. Firstly, students were instructed to write a text, and this exercise was based on an old national exam and provided a useful practising opportunity for the students for a similar exam in the future. The requirements were not too demanding as the students were instructed to write a text of at least 200 words. The second part of the assignment was then meant to identify errors of any kind, individually on your own and then with help from ChatGPT. The class was to be split in half, with one group starting to use ChatGPT as an individual assistant to help the students to gather their errors then writing them down on a list for future reference. In contrast, the other group did not use ChatGPT and worked by themselves to identify their own mistakes and errors without AI. The aim and purpose were to practise their writing skills, but also to raise their awareness of the potential mistakes they make while writing a text. In the end, this would bring attention to students' lacking areas that needed improvement, in the form of immediate feedback from ChatGPT.

Separating the class into two smaller groups proved to be of immense value to the observation, as this gave the opportunity to study fewer students more closely. Because of this, students' specific writing abilities and their individual chat messages with ChatGPT could be observed. According to Dörnyei (2007), observational studies are valuable in order to get research data that provides a legitimate description of a phenomenon that is being examined, in our case to investigate if and how ChatGPT could be a resourceful tool for the development of students' writing skills. (p. 185). Regardless, it is important to note, that only the things that presented itself during the observation will be discussed in this essay, as an observational study should not investigate the unobservable factors and theoretical thoughts and ideas of why a specific phenomenon occurred as argued by Dörnyei (2007, p.185).

One important thing to highlight is that the classrooms we observed were highly heterogeneous, as some students were proficient in English whilst others struggled. For this very reason, one might have opted for a longitudinal study to better understand the impact of ChatGPT in the EFL classroom for a longer period in order to see personal growth over time. This study, however, strictly focused on a small sample of lessons and as this study will later reveal there are indeed some interesting and surprising results in how adolescents' development is affected by ChatGPT.

The students in question consisted of two first-year classes, in the course English 5 for upper secondary education. There were no specific reasons as to why these students were selected, other than availability. When performing the field visit, it was important to record the findings through field notes as suggested by McKay (2006, p. 81). The notes consisted of important aspects as determined by the researchers. The field notes consisted mainly of students' behaviour, attitude towards ChatGPT, and what students' said in regards to the chatbot. Furthermore, the field notes also contained the researchers' own reactions to what occurred in the classroom. The field notes were constructed in different columns to simplify taking written notes within the classroom, and to aid the analysis process. This was done by organising the notes in mainly key events that occurred, and also issues students were faced with (Mckay, 2006, p. 82).

### **5.1.2 Post-observational interviews**

After our observations, we interviewed two educating teachers who had different outlooks on what new technology may entail and how it could prove beneficial to language development. One teacher remained mainly positive, since it provided the students with the opportunity to easily gather information, create stories, and help with certain questions while the teacher may take a while to reach the student. In contrast, the other teacher displayed partly negative feelings towards the usage of Chatbot assistants as a pedagogical tool, and was not enthusiastic about possibly incorporating it into education. The regard the last teacher made mainly refers to the possibility that the students may use artificial intelligence to cheat and therefore it is not possible to determine the possessed abilities.

By suggestion from Mckay (2006), it was important to perform interviews with the teachers after the observations to further the empirical foundation for the study, and to analyse how students performed during the lesson (p. 18). We performed semi-structured interviews that were carried out in Swedish, recorded, then followed by a verbatim transcription process which was translated into English and further analysed. The interview guide, and questions will be available as a separate attachment to this essay. The questions were based on previous experience from the observations where certain aspects presented themselves. Each interview started with relationship-building questions to achieve familiarity with the respondent. The reason for this was to encourage a less structured manner of answering during the interviews to achieve conversations where the respondents could elaborate on the question. After the

relationship-building questions, the interview would move on to questions regarding the specific lesson featuring ChatGPT that was this study's observation.

In order to have as engaging and resourceful interviews as possible, and to maintain the reliability of the interviews, it was essential to conduct the interviews at the teacher's earliest convenience after the observations. Interviews were held at the school's premises where the teachers worked, and with the permission of the interviewees it was recorded. The interviews were recorded to maintain an objective point of view from the teachers, and to avoid the interpretation process that may occur while analysing, as suggested by Mckay (2006, p. 55). Both interviews were semi-structured to allow the respondent and the interviewer to expand the questions if necessary and ask follow-up questions that would allow for a constructive conversation as proposed by Dörnyei (2007, p. 136-137). Incorporating a semi-structured interview, presents the opportunity to notice and discuss results that may not be noticed by the researchers. The respondent gives the opportunity for the interviewer to ask and elaborate on certain issues that were found to be especially interesting and would allow for a discussion, resulting in an ample foundation for empirical data to further analyse. In order to achieve a fruitful analysis, the transcribed interviews were read several times, and key contents regarding the students behaviour and issues regarding ChatGPT were categorised (Mckay, 2006, p. 57).

## **5.2 Ethical Considerations**

Prior to starting the observation, students consented to our participation in their lesson as well as our data being collected from the notes we made. Our presence as well as our intentions were explicitly explained to all students present in the classroom. They were given the opportunity to give consent or decline us gathering information about our observations. Furthermore, as was disclosed in the permission forms they were given, nobody but the authors of this essay was going to read the data. This was particularly important in order to preserve the anonymity and integrity of all students who participated in the observations as the scientific ethical code of conduct states in Vetenskapsrådet (2017, p. 40-41). Moreover, if for any reason, students declined to participate in the observation, we would not use any empirical data in our study that originated from those students, but fortunately all students present during the lessons gave their consent. Additionally, the observations will not be affecting the familiar education environment

in any way, as the main purpose was to observe a realistic teaching situation in the ordinary classroom, not to intervene.

## **6 Result and Analysis**

The following part of this study's investigation will present its main findings and discuss them continuously with previous research when relevant. Through close one-on-one observations made possible through small student groups, this study's findings will present a two-sided perspective that explains how ChatGPT can possibly affect students' language development, their cognitive load as well as their willingness to interact with a virtual peer in order to create an optimal situation for a zone of proximal development to take shape.

### **6.1 Observational studies**

In regard to the targeted lesson that this study's observation is mainly focusing on, the lesson plan can be found in its entirety in the appendix. The execution of the observations were constructed within two different classes during their English 5 lessons. From an observing point of view, this study could actually recognise the fact that ChatGPT was not entirely appreciated or perceived as valuable feedback if for some reason AI's answer was too complicated for students to understand. This ultimately resulted in some students being discouraged to pay attention to AI's generated feedback. However, the educating teacher made sure to support the students expressing themselves coherently with their instructions to ChatGPT. This made the feedback more straightforward, easier to comprehend, and most importantly less impactful to the students' self-confidence, as the responses were deemed to be kind of strict. A premade prompt from the teacher even highlighted some good things about the student's text, by means of “two stars and a wish concept”. By using this premade prompt, some students switched their behaviour and paid more attention to the response they received. Interestingly, similar things occurred in another study mentioned by Shadiev and Feng (2023, p. 18), where students displayed feelings of anxiety and frustration when receiving feedback from *Grammarly*, a similarly AI-powered digital tool. However, during our observations, students expressed feelings of joy whenever they perceived the feedback as positive regarding their abilities. The aforementioned feelings were expressed by loud cheers from several students, who seemed to value the feedback as if they rarely received

positive remarks about their writing capabilities. With that said, it was observed that students either displayed cheerful feelings or completely disregarded the feedback if it was interpreted as negative criticism.

### **6.1.1 Execution of observation class one**

Originally, the educating teachers were planning on including ChatGPT in the lesson in order to teach students to make use of it for other things than cheating, and thereby enabling a new digital assistant intended to further enhance the learning process. This approach was somewhat similar to what Huang et al. (2023) researched, as they used AI based technology in order to influence students' learning process by using personalised recommendations (p. 7).

To this class in particular, this learning activity was a major change in how they usually practised their writing abilities, as ChatGPT was an unfamiliar element in the teacher's educating method. Despite this, some students seemed to adopt an open mindset and several students were curious to try this new method in order to receive feedback on a text of their own creation, whilst others instead preferred to find their errors on their own.

The main purpose of the observed lesson was to not immediately correct a recently written text, but to highlight and raise the students' awareness of the common errors they made when writing a text. Errors could be anything from spelling to grammar mistakes or coherence and sentence structure. The class featured 15 students and they were divided into two groups. The reason for splitting the group was simply to see one group to initially start to find their own errors, and later, instruct ChatGPT to find errors in the same text. It was actually crucial to divide the students, otherwise the ChatGPT servers could have reached its max capacity due to a limitation of users from the same internet ip address.

Students not only explained to the teacher that the interaction they had with ChatGPT was worthwhile, but they believed that the chatbot's feedback was correctly phrased and adhered to them on a personal level. One student actually explicitly stated that the feedback from the AI was more reliable than any feedback that came from the educating teacher, as ChatGPT is not in any position to grade their performance. Interestingly, according to Hyland and Hyland (2006), some students might feel constrained to question their teachers because of their authority in the classroom (p. 89). Because of this, some students could be less motivated to reflect on feedback received by a teacher, as students might simply do as they are being told in order to receive the



desired grade. Perhaps, this could provide a necessary usage of ChatGPT in order to actually make students become more aware of what areas in their writing abilities still need improvement.

To some students, as became evident in this observation, they do not perceive feedback generated by an artificial intelligence as instructions from a figure of authority. Instead, most of the feedback was regarded as clear, unbiased and with no intended judgement of their character or skills. However, it is of the utmost importance that the feedback generated through interaction with ChatGPT is discussed and not free from criticism. There were some errors that were misinterpreted or not fully understood, as became evident from some responses that the AI provided its users:



Certainly! Here are three errors highlighted, followed by three commendable aspects:

**Errors:**

1. "or just in genneral" - The correct spelling is "general."
2. "People use music to stay more productive" - Missing article. It should be "People use music to stay *more* productive" or "People use music to stay *productive*."
3. "for example rap music, People refer rap music" - Missing conjunction. It should be "for example, *when it comes to rap music, some people refer to rap music.*"

**Commendable Aspects:**

1. You effectively express your opinion and provide examples to support your argument.
2. You make a distinction between different genres of music and their cultural significance.
3. You acknowledge that music can have both positive and negative effects on individuals, showing a balanced perspective.



In the aforementioned example, one student struggled to fully understand the terminology presented by ChatGPT or understand the highlighted error. Conjunction proved difficult for the student to grasp due to lacking proficiency. On the other hand, after the educating teacher commented and supported the student to help them understand, it provided a great means of scaffolding and the student exclaimed positive views regarding the feedback from ChatGPT. While the student valued the feedback from ChatGPT greater than that of the teacher, due to its inability to make grammatical errors. The teacher explained that while ChatGPT was correct in its feedback, there was a risk that it could be mistaken or misinterpreted and therefore the teacher's explanation was important. From a didactical perspective, a teacher should always

make sure that their students learn correct grammatical form, as exposure to incorrect input could lead to fossilisation (Ellis, 2012, p. 186).

During this observation, it would seem that students in the group that initially were instructed to find errors on their own were less incentivised to put effort in the assignment. Some even argued with the teacher saying that their text was completely free of errors, as their text was close to perfection. Nonetheless, some students switched their attitudes when they received auto generated feedback from the AI. This was evident as multiple students realised they could not argue against the chatbot as they might with their teacher. Interestingly, students displayed feelings of humbleness towards any feedback they deemed trustworthy from the chatbot. Simultaneously, if instructions they received from ChatGPT were clearly incorrect, the students expressed doubts which in turn increased their vigilance towards further remarks from ChatGPT. There were several students who were able to expand their understanding of grammatical complexity if ChatGPT was told to ignore spelling errors, and in so doing, reducing students' cognitive load and optimising their self-reflective thinking skills (Lovell, 2020, p. 54).

When the other group who originally started their interaction with ChatGPT was later instructed to find errors on their own, something happened. Again, this was not the case with all students, but there were some students who displayed an eagerness to find even more errors in contrast to the other group. It was as if ChatGPT had initially scaffolded the students into helping them to find errors. That being said, this study's empirical data would be even more enriched if only the observation could continuously study this specific class for a longer period of time, as has previously already been pointed out.

From our observations, it is impossible to properly measure the cognitive burden that some students might have experienced during the observed lesson. However, as previously stated, during an observational study, one must only pay attention to profound and experienced empirical data from the observation, and things that are not observable should not be a part of the empirical data. However, there were two students who were accustomed to being given digital assistance in order to efficiently participate in a writing assignment. These two students had been struggling with spelling, grammar, punctuation and cognitively demanding tasks such as self-reflective thinking skills and creative thinking skills. In order to overcome these obstacles the teacher usually provided these students with aiding software that acted as support for cognitively demanding skills such as spelling and grammar.

To summarise the observation of class one, there is a risk that students blindly trust ChatGPT and assume the received feedback is flawless. The teacher tried to explain to the students that ChatGPT can make mistakes and therefore it is important for the students to be vigilant and aware of mistakes they do, and not simply correct them when a digital tool tells them to do so. Interestingly, this could not only be the case for ChatGPT, but other digital tools as well. However, ChatGPT can assume the role of a scaffolding partner when performing a cognitively complex assignment, and thus effectively aiding the learning process whilst easing the cognitive burden (Sweller, 1988, p. 277).

### **6.1.2 Execution of observation class two**

This class was executed exactly the same as the one discussed above. The students initially wrote a text, that later on was supposed to act as a foundation to the remaining part of the lesson, finding their own errors, such as spelling, grammar, punctuation, repetition, sentence structure and more. They were divided into two groups, one group was assigned to, individually, find errors throughout their text, whilst the other group used ChatGPT as a partner to help them find their mistakes in the written text. After some time, the groups switched, giving all students the opportunity to use ChatGPT as a scaffolding partner.

Once again, this group represented a heterogeneous classroom, with some students mainly being more proficient than their peers. Interestingly, this caught our attention as both well-performing students as well as those who struggled with the English language as a whole, seemed to perceive ChatGPT as a new and interesting way of learning more about their own proficiency level. Firstly, one student who usually performed above the average level had issues finding errors in the text of his own creation. From an observing point of view, this student believed that the text was almost free from errors, with the exception of some spelling mistakes that had already been identified.

It is important to remember that the task the students were given could be quite challenging, as they were instructed to find all kinds of errors in their text. Finding different kinds of errors was, as it would prove, from the observation difficult and perhaps even a cognitively demanding task. When asked by the teacher about grammatical errors, a student was completely unable to identify even a single error, as became evident when initially tasked with identifying mistakes in the text. The student viewed the text for a few minutes before exclaiming

that there were no errors other than spelling mistakes that occurred during the writing process. Continuously, throughout the lesson, this went on as finding other errors apart from spelling errors was especially demanding. Apart from a few students there were some considerable challenges to identify incorrect verb tenses, incorrect usage of is/are, has/have, punctuation, and failure to notice repetitive phrases and words. However, as soon as ChatGPT was involved and the students were provided a long list of errors, they initially reacted similarly to students from the first lesson. They felt horrible about their own performance if the feedback from ChatGPT was too immense and they failed to actually read it thoroughly. The teacher then told them to use the prompts provided in their assignment in order to make it easier, one of these prompts stated:

“If I send you a text that includes grammatically incorrect sentences, could you highlight three errors I made and then mention three things I did well.” (Lesson Plan, English Course 5, 2024-02-06)

Just like the previous lesson, students' attitude abruptly switched and they even became more interested in additional feedback from ChatGPT. As previously mentioned, there was one high performing student who failed to identify his errors before using ChatGPT. However, when guided by this assistant, he seemed more curious than usual, as pointed out to us by the teacher after the lesson. Interestingly, it was as if this specific student tried to outperform or outsmart the AI as he firmly believed that it had to be wrong about something. However, ChatGPT helped this student to get past the limitations of a cognitively demanding task, such as finding specific grammatical errors, and not simply spelling mistakes. This has been pointed out by Bai et al. (2023), who argue that artificial intelligence can help its user to actually preserve mental energy and instead guide the student to focus on more specific problems, as also was the case with this specific student during the observation (p. 7). On multiple occasions during the lesson this student asked whether the explanations ChatGPT provided about various grammar were correct or not. The teacher then in several situations simply stated yes, that explanation was correct. Finally, when the student did find a mistake from ChatGPT, it was as if he conquered a superior combatant. The teacher wanted their students to practise linking words, and when ChatGPT failed to provide proper linking words, this particular student triumphantly proclaimed that ChatGPT was wrong about something. The reason why this is highlighted, is the fact that it acts

as an example of how ChatGPT can open up a struggling student's mind and create a scaffolding situation where the student's cognitive capabilities are pushed to the limit instead.

As previously mentioned, there was a considerable difference regarding proficiency present in this classroom as some students were fully capable of managing this task by themselves with little effort from the teacher. Whilst, on the other hand, there were those students who struggled to understand the responses they received from their robotic-like assistant. There was one student who for a long period of time had been struggling with English, and especially grammar. The following is an excerpt of the student's interaction with ChatGPT, prompt was made by the educating teacher as to guide the student:

**You**

are there any more examples of grammatical errors apart from spelling mistakes in the text?



**ChatGPT**

Yes, there are a few more examples of grammatical errors in the text:

1. "I can ´ t think how terrible they have it." - The contraction "can't" should be expanded to "cannot" or "can not" for formal writing.
2. "I have meet older people..." - "Meet" should be in the past tense as "met."
3. "It ´ s not okay, and I be sad for that how you can do so to another person." - "I be sad" should be "I am sad," or "I feel sad."
4. "But that have nothing to the color of their skin to do." - "To" should be "to do with."
5. "But haw is that a problem? I ´ dont understand." - "Haw" should be "how," and "I ´ dont" should be "I don't."

These errors relate to verb tense consistency, subject-verb agreement, and word choice.

From the student's perspective, this information was, despite being fairly limited, too complicated to understand independently. However, the response once again gave the educating teacher the opportunity to discuss common grammatical errors that often occurred within the class. Interestingly, the educating teacher was not surprised by the list of errors presented as this had previously been discussed with the student in question. However, this moment provided an alternative perspective to the student about their language performance, and what is in need of improvement. From an observational point of view, this could be interpreted as a scaffolding situation where the educating teacher was given the opportunity to further explain and interpret

the feedback provided by ChatGPT. Situations such as this would clearly be valuable as long as the teacher is present to provide explicit instructions, however, as pointed out by Bai et al. (2023), there is a risk that information from ChatGPT could be inaccurate or confusing, resulting in a devastating effect on the student's learning process, as previously already pointed out (p. 5).

To conclude the second observation, ChatGPT proved once again to be resourceful as was the case with the above-mentioned student who struggled to identify their mistakes, although through scaffolding from AI, the assignment became more enjoyable to the student who became more self-aware regarding written errors. In contrast, another student struggled to understand the feedback presented by the AI due to the immense amount of feedback that was presented to the student who lacked a high proficiency in written English.

## **6.2 Qualitative interviews - Post observations**

The interviews not only give confirmation to this study's findings during the observations but also provide interesting information about the students as a whole and the teachers' perception about ChatGPT. The educating teachers closely cooperate when designing and performing lesson plans. Despite having different methods when talking about education and student development, they work closely to make sure that all students in their school receive the same level of education in the English courses of upper secondary education. Their respective approach to the teaching profession provides an interesting aspect of how ChatGPT could impact their learners' language development. In the following part, both teachers will remain anonymous and because of this they will be referred to as Teacher A and B respectively.

### **6.2.1 Interview Teacher A**

After the first observation, certain aspects were discovered that were of interest to be discussed during the interview, such as students' attitudes towards feedback regarding their language proficiency. It was also of interest to discuss students' reactions towards the feedback from ChatGPT, and if they would actually pay attention to it, or if they simply regarded ChatGPT as a tool that enables cheating. Additionally, during the observation, it became evident that ChatGPT can be used as a scaffolding partner and was therefore of interest to discuss. This interview featured an educating teacher with seven years of experience in the upper secondary EFL education. Additionally, this teacher has a wide range of valuable experiences that are indeed

useful as a language teacher. With an international academic background and used to speaking English natively, this teacher's qualifications are broad.

This teacher still perceives the teaching profession to be constantly changing, as being able to try new things when it comes to pedagogical approaches is not only something she is curious about but her aspirations to differentiate the education is important. “Not everybody learns the same way, we need to meet our students' individual needs in order for them to learn in the best possible way, everybody is not comfortable with computers and they need to learn to use them”. That said, trying new digital tools in the classroom is not only fun to do, but she believes that it could be worthwhile in the long run. Trying ChatGPT was therefore not a completely foreign concept, digital activities were a natural thing, even though she firmly believed in a fine balance between attaining knowledge through computers as well as textbooks. However, this teacher believed that it was important to put emphasis on the purpose of certain pedagogical tools. As previously stated, learning occurs in different manners, therefore, it is important that teachers adapt to their students' different ways of learning (Lundahl, 2021, p. 170). Teacher A advocated the usage of computers as it provided great opportunities to work with a text of your own creation such as editing and correcting your errors. Moreover, she believed that many of her students lacked the endurance to stay on track with a writing activity as their cognitive capabilities are not enough to identify their own deficiencies in their texts.

“[...] There is a student who is quite weak and doesn't want to realise his shortcomings in his language and once he got feedback he couldn't bother to read it because he said he didn't care. However, that could be a defence mechanism, I think. That they have difficulties accepting criticism.” (Teacher A, authors' translation).

Throughout this interview, we discussed the usage of not only various technological tools in the EFL classroom but also what students usually need to work with. As the interview moved along, we reached the main topic for the interview, ChatGPT. Despite being proficient regarding the usage of technology in the EFL classroom, there were some concerns regarding the ChatGPT software, and its possible impact on her students' language development. Once ChatGPT has been introduced as an educational tool, there is no going back:

“[...] But it's also been a little scary to present this as a tool to my students, because if you show this kind of software to students it's kinda like; here you go, some candy, go ahead and eat it. It's kind of difficult to have it at the correct moment, is it too much or not enough? We've actually had a lot of problems with well-performing students who recently started using ChatGPT for the sole purpose of cheating, and they've been sneaky about it...” (Teacher A, authors' translation).

As we continuously discussed some of the negative aspects of ChatGPT, the teacher shared her recent experiences that some students were using it for plagiarism and deceitful purposes. This eventually ended in her expressing her frustration as she believed she had difficulties in making students understand that their language development was now suffering as some of them truly had great potential. At the same time, she believed that many teachers nowadays are still oblivious to ChatGPT, and that dealing with the consequences of its impact is close to unmanageable, at least for the time being. Teacher A continuously expressed her concerns regarding how ChatGPT is too easy to use as means for cheating, and she told some of her students over and over that she believed that her students are indeed smarter than an AI, and should not leave the fate of their grade in the hands of ChatGPT.

There are some potential advantages that can be extracted from this software though, as Teacher A argued. She believed that in order to make use of ChatGPT efficiently, it is important to explicitly explain how and why it is being used in the classroom. Students are not aware of pedagogical aspects as teachers are and need to be inspired to use it correctly, with their language development in focus. If left unattended, students will display idle characteristics and act lazy by simply telling ChatGPT to undertake their assignment on their behalf. Therefore, as the teacher explained, teachers need to act as a scaffolding partner to the students when ChatGPT is involved in any kind of classroom activity. In their study, Bai et al. (2023) partly discussed how some consequences of opting for ChatGPT as an educational tool could lead to students developing an overreliance on their AI assistant, which in turn could potentially diminish their motivation to learn at all (p. 5).

As for the future, Teacher A firmly believes that all teachers need to make adjustments and be prepared for an even more effective Chatbot-like software in the not so distant future. Thinking in positive ways, Teacher A does believe that there are some potentials for ChatGPT.



When asked about this she immediately thought about some of her students that are extremely introverted in their nature, and Teacher A believes ChatGPT could become an interlocutor that they so desperately need in order to continue their language development:

“I've thought a lot about using ChatGPT as a conversational partner. If you have very shy students who never dare to speak in a classroom, I have one student like that, a girl who is yet to say a word in English [...] and I'm trying to trick her everytime I see her to do it [...] just to have a normal casual conversation[...]" (Teacher A, authors' translation).

As the interview draws to a close, we discuss how schools should apply a policy about how to use ChatGPT. Perhaps it could prove to be a good idea for any school to actually decide how ChatGPT should or should not be used. If used correctly perhaps students will discover by themselves that ChatGPT could be resourceful as some students stated during the observations. In contrast, as pointed out by Teacher A, one of her students explicitly stated that the feedback from ChatGPT was not valuable at all, and that feedback from the educating teacher was way better and easier to comprehend. With that said, students are different, and because of that ChatGPT is but one alternative to offer students, in pursuit of their continuous development.

### **6.2.2 Interview Teacher B**

It is important to note that both teachers were present during the two observations; thus, interviews were constructed in the same manner, but because of the semi-structured method, the topics of discussion differed despite the same interview guide being used, as can be seen in appendix E. As became evident during both observations, technical difficulties occurred, and was of importance to discuss due to the time-consuming factor. Furthermore, the aspect of feedback proved to be a topic of interest, and how ChatGPT and the educating teacher's feedback could be combined for a joint effort to promote language development. Additionally, it was observed how the teacher made an effort to show the students how feedback is created and therefore how it differs from the feedback presented by AI, and in so doing, explaining that ChatGPT is not to be blindly trusted.

Teacher B, as we will call her during this section, shared her thoughts on how ChatGPT could be used effectively and beneficially in order to promote language development for her

students. Her attitude to ChatGPT was fairly similar to that of her colleague as they both seemed to believe that there are some problematic disadvantages with the implementation of ChatGPT in any kind of English course for upper secondary education. This educating teacher should be considered as a veteran in teaching due to being a teacher for well over 16 years. While Teacher B has years of experience, she is not a stranger to trying new pedagogical methods in the classroom, but has opted for a more cautious way when there are certain risks involved. One major factor was that of her own experience with technical equipments or various digital tools over the years, that they could in fact be quite time-consuming, resulting in valuable educational time being wasted:

“[...] I mean time, it can take quite a while, which results in many not getting started until half way through the lesson, and then it's not just that I don't have the time, but that they simply choose not to start.”(Teacher B, authors' translation).

That being said, Teacher B advocated for the usage of digital tools in the classroom as long as they specifically served a purpose, with an explicit aim to improve the English language abilities of her students. With that in mind, Teacher A and B's lesson plan specifically made use of detailed feedback from ChatGPT that individually provided each and every student with immediate feedback right after they wrote their texts. During the interview, Teacher B explained how a student received positive feedback and viewed it as superior due to the lack of positive remarks in their usual feedback. Interestingly, one student recognised the feedback as more useful than the teacher's. It was clear during the interview with Teacher B that it should not be considered as less valuable. However, ChatGPT provided an opportunity to act as another commenter on the individual performance for each student. According to Teacher B, ChatGPT received instructions to mention positive details about the proficiency of her students' performance, which is something she avoids, as discussed during her interview:

“[...] I think it's a good tool in that way. If you ask if the students take it to heart more or less than my feedback, I think that as long as it's fairly new, they find it a bit exciting and maybe attach more importance to it. [...] If you have a relationship with your students, I think they also attach importance to my feedback. “[...] (Teacher B, authors' translation).

Teacher B firmly believed that ChatGPT could be used in tandem with the teacher, such as combining their individual feedback to students. This would in the end make the feedback more trustworthy as it comes from two separate sources with the sole intention to improve the user's lingual abilities. There are some aspects that would be crucial to note as Teacher B pointed out in the interview regarding ChatGPT's feedback. Artificial intelligence could present an alternative insight to feedback and provide students with alternative means of instructions in how to improve their language capabilities. Moreover, Teacher B explained that there will be a difference in feedback and how it is presented, appropriated, and appreciated by the student:

“[...] There will always be situations where I see things that I give feedback on, and ChatGPT sees something else and gives feedback, or vice versa. Different things are emphasised. So I think you have to make the students understand that one does not exclude the other. There is a difference between human feedback and a computer's feedback. There will always be a difference. [...] (Teacher B, authors' translation).

The educating teacher needs to make it clear to students what the best solutions are to improve; feedback from ChatGPT is only one small fraction of making sure the student's language keeps improving. After making sure the student takes any kind of feedback to heart, it is entirely up to the educating teacher to assess development continuously through means of formative assessment. Interestingly, as discussed during the interview, Teacher B believed that the feedback given to the students from ChatGPT could be used as a future reminder to her students of what they need to keep in mind for upcoming assignments, as a way of formative assessment.

## **7 Discussion**

The purpose of this essay has been to investigate how and if there is an efficient way to introduce the artificial intelligence-based software ChatGPT in the Swedish EFL classroom, and specifically the course English 5 for upper secondary education. This software has in a short period of time received attention all over the world and has indeed had an impact on society. However, there are some concerns that most students are using this AI-assistant in order to cheat on various school assignments. With that in mind, this study wanted to find out if it could be

used to further develop students' English language abilities. As observed during this study's observations, ChatGPT proved to be an educational tool for some students' language development as it offered a new perspective by reducing students' cognitive burden whilst trying to identify individual errors in a text. With that said, it is difficult to determine if language development has occurred for students during this study's time frame, although a longitudinal study could, in theory, investigate that further. The questions that guided this entire essay will in this section be answered and discussed one by one.

### **How can AI be used efficiently to further enhance the language development in the EFL classroom, and what advantages as well as disadvantages are there?**

Artificial intelligence has proven to be an effective tool when trying to practise and further strengthen students' English writing abilities if explicit instructions are provided in order to use it as a resource for individual purposes. However, students might be overwhelmed by statements provided by ChatGPT and could even be discouraged if ChatGPT's information is too immense as there might be a lack of deep understanding as recognised by, not only our observations, but also previous research (Bai et al. 2023, p. 5). Students might have trouble understanding and comprehending information by artificial intelligence, the information and instructions from ChatGPT can be considered troublesome or hard to comprehend (Bai et al. 2023, p. 5). This was evident from not only both observations, but it was also recognised from the two educating teachers who made sure to reformulate the instructions given to the AI in order to make the information from ChatGPT more concise, personalised and encouraging. To mitigate this, the prompts did not only ask for ways to improve the text, but also to highlight parts of the text that were satisfactory, as to raise the self-esteem of students on an individual level. Similar studies have been conducted by Song and Song (2023), who concluded that personalised instructions from ChatGPT, were beneficial for individual language development, and suggests that integration of artificial intelligence would, in the end, prove to be beneficial for the learning process in general (p. 12).

One advantage that ChatGPT could provide for language development is therefore an increased awareness of errors created when writing a text through feedback. ChatGPT is capable of providing immediate feedback individually, to each and every student in the classroom. In the

end, this would not increase language development on its own, but it provides students with a moment of self-reflection as soon as a text has been completed. ChatGPT provides its users with interactive learning by acting as a scaffolding partner, creating opportunities that would facilitate personalised learning for each and every student by reducing the cognitive pressure and simultaneously aiding the teacher, as observed in the classroom and also concluded by previous studies (Bai et al. 2023, p. 4; Sweller, 1988, p. 277). Through specific assistance from the teacher, immediate feedback generated from ChatGPT could then aspire to raise autonomy for students and, thereby, raise their general understanding of their personal requirements for further growth in the English language (Song and Song, 2023, p. 12). Feedback acts as an interactive part of learning (Hyland and Hyland, 2006, p. 86), and therefore the implementation of ChatGPT could result in comprehensible feedback instantaneously. However, there is a risk that students, if not provided with proper explicit instructions, would blindly trust artificial intelligence, and place an overreliance on ChatGPT over their personal capabilities (Bai et al. 2023, p. 5).

There are some consequences that any teacher should consider when opting to introduce ChatGPT in the Swedish EFL classroom. It is of utmost importance that ChatGPT is thoroughly explained so that it could be used for language development, and not create new means of cheating. As explained by the educating teachers in this study's interviews, it could indeed be a challenge to any student to fully comprehend how to use this utility in a beneficial way. In the classroom, the educating teacher needs to be aware that ChatGPT could provide its users with either too complicated information or simply incorrect statements. This could, in the worst possible scenario, create a situation where fossilisation occurs, meaning that if a student learns something that is inaccurate, it could be rather difficult to relearn (Ellis, 2012, p. 186). Moreover, as previously mentioned, there are some concerns that students might be incentivised to blindly believe anything that ChatGPT says instead of listening to their teacher. However, in contrast to this, as long as the educating teacher proves to be a reliable and competent leader in the classroom, and continuously encourages their students to grow, ChatGPT will merely be a tool in the EFL classroom and not perceived as a source for the ultimate truth through the eyes of students.

**How can AI be integrated in the EFL classroom in order to ease the cognitive burden of students, and act as a scaffolding partner?**

On some occasions throughout the course of English 5 in upper secondary education, there are numerous situations where students are required to think in certain ways that require cognitive thinking skills. Anything that is deemed to challenge the mind could be considered a cognitively demanding task (Sweller, 1988, p. 261). Of course, the teacher could provide explicit instructions in order to provide further details for a complicated assignment. However, time is of the essence, and there might be situations where the educating teacher's time is not enough to meet each and every student's individual needs in the EFL classroom. As explained by a teacher and likewise observed during an observation, ChatGPT could scaffold a student in need of further instructions in order to better understand an assignment. Previous studies have found that the usage of ChatGPT could leverage students' cognitive thinking skills, and ease the burden that might appear when faced with a difficult challenge in any in-class activity (Essel et al. 2023, p. 9). Artificial intelligence could provide, if the prompts are coherent enough, students with examples, suggestions and alternative ways to handle a problem. This could, as witnessed during one observation, be a trigger to students and make the learning process more engaging, motivational and even perceived as more valuable to the student individually. When the chatbot is perceived as an authentic interlocutor, the individual learning process could be enhanced (Jeon, 2022, p. 20). This could prove specifically beneficial to introvert students who may experience discomfort when interacting with fellow classmates.

However, as ChatGPT is a machine and lacks proper emotional capabilities as a human, the user needs to be aware of its limitations. Furthermore, there is a constant risk of being exposed to either false or biased information depending on the topic being discussed with ChatGPT. This in the end needs to be evaluated by the teacher, if students are able to handle this and be capable to stay alert and be critical towards ChatGPT as a general attitude. Overall, ChatGPT could be used for scaffolding purposes if the instructions of how to use it are clear and precise and the students have a specific objective, as was the case during the observations. Furthermore, learning occurs most effectively when it is situated within a learners' zone of proximal development which could be expanded by implementing ChatGPT as a scaffolding partner (Song and Song, 2023, p. 3).

## **Is it possible to make use of AI in order to raise students' awareness of their individual errors, through feedback generated by ChatGPT?**

Sometimes it could be helpful in any learning situation to make sure that students learn from each other through scaffolding, ultimately providing opportunities to actually use the English language in an authentic situation. That being, a situation where students are put in a position where they are required to communicate in the English language. This means that the student is exposed to necessary input as well as output occurrences where they get the chance to actually practise with a conversational partner. ChatGPT has the possibility to adopt the role of a scaffolding partner due to the ability to create human-like interaction, which has been further investigated by Jeon (2023), who states that ChatGPT could create effective conditions for vocabulary learning (p. 1359).

During both observations as well as the interviews presented, there are situations where social interactions could be impossible for several reasons, one being the challenge of some students being introverted and simply refusing to participate in any tasks where social interaction is required. This might not be the case with the majority of students in a classroom. However, due to the fact that the heterogeneity of a classroom can present itself in various ways, ChatGPT could be an alternative to give introverted students an optional interlocutor apart from the teacher, or other classmates. This has been acknowledged by Bai et al. (2023), who state that interaction with AI might reduce perceived pressure in a learning environment (p. 5). With this in mind, as previously already pointed out, a student should not be left unattended with ChatGPT if there is a risk of exposing them to a situation where fossilisation might occur. The educating teacher needs to be active and read what ChatGPT actually says in order to quickly point out incorrect information. This involves providing clear instructions to the student in order to avoid misinterpretations and to make sure that the student's confidence is not jeopardised if the information from ChatGPT is in any way too complicated for the student to understand.

ChatGPT should not be interpreted as a burden for the teacher, rather a tool to provide alternative means of interaction. This would mean that ChatGPT could act as a bridge between introverted students and their fellow classmates or teacher in order to make the leap to real conversations at a later time. ChatGPT should therefore be treated as a tool to encourage authentic social interactions and not be treated as something that ultimately replaces real-life

social interactions. It is important for students to develop critical thinking skills which may be done through any interaction with ChatGPT. In other words, students need to constantly stay vigilant to any kind of information that is provided from ChatGPT (Song and Song, 2023, p. 11).

## **8 Conclusion**

During the observations as well as the interviews it became clear that not all students learn in the same ways. Our observations presented various students that reacted differently when using the ChatGPT software, some neglected it completely whilst others were more curious. This curiosity proved to increase some students' awareness of their personal writing capacity as they clearly showcased an eagerness to understand more about their personal capabilities. Students' individual language development was difficult to determine, but for some students, the assignment became more comprehensible when using ChatGPT, as the chatbot seemed to ease the cognitive burden, resulting in a more optimal learning process. The learning process differs between students, some need structure and thorough practice by themselves, whilst others need situations where students are able to learn from others, through means of scaffolding.

During the observed lessons, ChatGPT was an included factor to act as an assistant to students in order to help them identify their most commonly made mistakes, so in the end, they would be more aware of their individual language errors. This could be considered to be both successful and not without its limitations, as some students reacted positively to ChatGPT's response, whilst others reacted negatively or refused to consider what the response specifically said if it was too complicated. Moreover, some students failed to understand what ChatGPT's feedback meant, meaning a teacher's further explanation was needed. On the other hand, some students were interested and showed an increase in self-reflection when interacting with their machine-like assistant, as mentioned above. This in turn suggests that if used constructively, ChatGPT could ease the cognitive load a student meets when faced with a particular challenging assignment, such as finding errors in a text of your own creation.

In the case of practising their English writing skills, students could become more aware of their deficiencies if proper feedback is delivered. In the sense of saving time, ChatGPT could be helpful to teachers, and students, to create individualised, instantaneous feedback. This feedback could, at a later point in time, be used as a formative assessment by the teacher in order to continuously keep track of their students' development throughout a longer period of time. In



addition, chatbots could be a useful tool to promote social interactions to students who otherwise would completely avoid such situations with their peers.

To summarise, ChatGPT could ultimately raise students' awareness of their lingual abilities and what they need to further practise, which could, in theory, increase their language development. It is crucial, though, that teachers provide explicit instructions whenever necessary as ChatGPT could provide its users with lengthy responses. Finally, ChatGPT could be used as a valuable interlocutor for students in order to provide suggestions and means of various solutions on how to solve problems. However, students should not be left unattended with this utility, as lack of proper instructions could have negative results such as harm to their self-esteem and fossilisation. Because of this, teachers should carefully consider implementing this tool in their education as it might present itself with not only advantages but disadvantages alike.

## **9 Limitations and suggestions for further research**

In order to keep this topic as narrowed down as possible, we opted to focus specifically on the usage of ChatGPT in the course English 5 for upper secondary English education. The study has, by means of a qualitative method, investigated how ChatGPT could be used to ease the cognitive burden for students, and provide useful support from a scaffolding perspective to further broaden students' writing skills. However, this study has been limited to two groups of fifteen students each. Because of this, we would recommend further studies that could through a quantitative approach study even more students over a longer period of time, and see if their reactions are similar to what have been discussed in this study's result and discussion section respectively.

Perhaps, alternative studies could further examine if ChatGPT can affect alternative language skills in the Swedish EFL classroom; such as reading, speaking and listening abilities. Investigating these skills in our study would prove to be exceedingly time consuming and would ideally be more suitable to investigate in a separate research. Limitations in this study were narrowed down to the perspective of a qualitative research method, and would therefore benefit from an alternative scientific approach. Therefore, this study recommends future research projects to investigate how and if ChatGPT could be used as an interlocutor that would develop L2 learners' all four language skills.

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## Appendices

### Appendix A

**Tema:** Lektionsupplägg med inslag av ChatGPT:

**Tid:** **80 min lektion**

**Syfte:** Eleverna **skriver en skrivuppgift** på exam.net under **30 min**. Detta görs i en prov liknande situation så att eleverna tar uppgiften på allvar med avskärmare mellan varje elev om det finns möjlighet, annars möbleras klassrummet om efter behov innan lektionen börjar. Färdigheter eleverna tränas i är skrivförmågan i det engelska språket. Efter skrivuppgiften ska eleverna genom att använda ChatGPT bli **uppmärksammade på de vanliga fel som de personligen begår**. Eleverna delas in i två grupper där de, individuellt, letar efter olika fel som de gjort i en lista, medan den andra gruppen använder sig av ChatGPT för att upptäcka fel, individuellt. Viktigt; felen ska inte korrigeras, utan summeras i en lista.

#### Beskrivning av aktiviteten:

1. När skrivuppgiften är färdigställd får alla elever samtidigt tillgång till sin text där de får kontrollera sina egna fel och får möjlighet att göra anteckningar om fel de upptäcker men inte rätta dem. De upptäckta felen skriver de sedan ner i en lista i ett word-dokument eller för hand i en lista.
2. Eleverna delas in i två grupper. **Den ena gruppen** ska individuellt upptäcka de fel som de gjort i sin text och skriva ner dem i en lista.  
**Den andra gruppen**, får med hjälp av ChatGPT i sin dator fråga AI om vilka fel de begått och ska sedan anteckna dessa.  
När eleverna inte längre hittar fel, byter båda grupperna uppgiften och de som inte använde AI från början gör det nu istället, medan de som inledde övningen med ChatGPT försöker nu arbeta vidare på egen hand.
3. Syftet är inte att korrigera och ändra något i sin text, utan **skriva ner information om de mest förekommande fel som eleven gör**. Detta ska sedan sparas för att återanvändas i framtida syfte för att ge eleven en tillbakablick över vilka områden i deras skrivförmåga som behöver förbättras.

Framtida uppgifter kan nu fokusera på individuell träning baserat på elevernas sammanfattade resultat.



## Appendix B

### **Writing assignment - How Music Affects us**

*Music means a lot to most people. We are surrounded by music; in the supermarket, on the bus, at work and at home. Can you imagine life without it? Do you prefer to listen to classical music, or is pop/rock music your cup of tea? How does your taste in music reflect your personal life-style? Do you ever go to live concerts, play an instrument or sing in a choir?*

Your task is either to write a text about a specific musical memory (Topic 1) or to discuss what effects music can have (Topic 2). Write as much as you can but are required to **write at least 200 words**. Also, make sure you have time to go through what you have written. You have 30 minutes to write either Topic 1 or Topic 2.

#### Topic 1

Most people have memories linked to certain songs or tunes. When you hear them, they remind you of people, places, events and/or feelings. Write about a specific musical memory and why it is so important to you.

#### **Title: A Musical Memory**

#### Topic 2

Certain rock groups are very provocative, both in appearance and in their lyrics. In what way do you think these groups influence people? Can certain types of music carry a political or an ideological message? Classical music is often considered relaxing or comforting. Dance or pop music might be what you want to listen to at other times—all depending on your mood. Discuss what effects music can have on people.

#### **Title: The Power of Music**

## Appendix C

### Prompts for students:

*The following text are instructions meant for ChatGPT, simply select, copy and paste these instructions into the chat box in the ChatGPT software, and then do the same with your own text in a separate message to ChatGPT and await its response.*

#### **Prompt one, find the most frequent grammatical errors:**

**If I send you a text that includes grammatically incorrect sentences, could you highlight three errors I made and then mention three things I did well?**

*Wait for ChatGPT to respond, then copy and paste in your own text, and await the Ai's answer.*

#### **Prompt two, find the most frequently used words:**

**Could you write a list of the most repeated words that exceeded 5 letters? Make sure to state how many times after each word within parenthesis.**

*Wait for ChatGPT to respond, then write down the words in your word document and then write as many synonyms to those words as you can.*

#### **Prompt three, write a better introduction and conclusion:**

**Could you rewrite the first two sentences and make them into a coherent and accurate introduction? Then make sure that the two final sentences are reformulated in a professional manner, like a proper conclusion should.**

*Wait for ChatGPT to respond, then write down the words in your word document and then write as many synonyms to those words as you can.*

## **Prompt four, adding linking words to improve your text:**

**Could you add linking words throughout the text where you deem them to be necessary. Then highlight them for me so I see what changes you made to the original text.**

*Wait for ChatGPT to respond, then write down the words in your word document and then write as many synonyms to those words as you can.*

## Appendix D

### Dear student,

We will be visiting your class, during one of your English lessons in order to conduct research for our university studies. We will be observing how you interact with artificial intelligence, ChatGPT and how/if it could be beneficial for your language development.

Throughout the lesson, we will be taking notes about your progress, your willingness to engage, and pros and cons during the lesson's activities. This will strictly be done for the purpose of understanding how your language development is affected by ChatGPT.

All observed students will be anonymous in the research. The names and characteristics of students will not be presented as to guarantee anonymity and integrity. The only people who may see the permission forms, as well the notes taken during the observation, are the researchers themselves.

### Permission to observe

Phone: \_\_\_\_\_

Student's name: \_\_\_\_\_

School: \_\_\_\_\_

**I hereby give permission** to the ongoing research project and accept that anything linked to my person will be used for research purposes conducted by the researchers, as described above:



Signature: \_\_\_\_\_

I do **not** authorise the usage of any materials linked to my person and/or achievements during the observation conducted by the researchers:



## Appendix E

### Intervjufrågor

#### Bakgrundsinformation

Yrke: Vilken examina har du och vilka ämnen undervisar du i? (Har du erfarenhet även från Gy alt 7-9?)

1. Hur länge har du arbetat som lärare?
2. Skulle du säga att din approach till lärarrollen är klassisk eller modern?
3. Hur förhåller du dig till digitala och tekniska hjälpmedel i klassrummet?
4. Försöker du vara nytänkande när du planerar din undervisning? Använder du exempelvis mycket digitala verktyg i din undervisning?

#### Relationsskapande frågor

1. Vad tycker du är mest givande för dina elever att arbeta med? Diverse övningar i en lärobok eller en övning som involverar arbete med datorer? Händer det att eleverna använder sina telefoner i din undervisning? Vad tror du eleverna motiveras mest av?
2. Hur brukar eleverna reagera på övningar som är kognitivt krävande? Specifika övningar som exempelvis innebär: kritiskt tänkande, vara kreativa eller uttrycka sina åsikter och känslor om något? Upplever du att denna typ av övningar kan vara svåra för vissa elever? Brukar det bli enklare i situationer där samarbete är involverat?

**Tänk att du har en digital övning där eleverna skriver en argumenterande text om ett valfritt ämne:**

3. Det händer ju att elever kan uppleva vissa moment som extra svåra och kanske rent av för komplexa. Hur gör du för att underlätta moment som kan upplevas utmanande för elever? Tar du bort delar av momentet helt eller hur underlättar du? Är det fortfarande möjligt för eleverna att uppnå samma kunskaper då?

#### Kärnfrågor:

1. Har du eller en kollega någonsin använt er av ChatGPT i undervisningssammanhang? Berätta närmare...
2. Hur tror du ChatGPT kan användas i framtida undervisning?

3. Tror du att artificiell intelligens som ChatGPT kan utgöra en god samarbetspartner till både elever och lärare som gör det möjligt för elever att utvecklas på individnivå?

### **Observationsfrågor:**

1. **ChatGPT Fusk.**

Hur tror du eleverna kan använda ChatGPT? Är det enbart i sammanhanget för att vilseleda dig som lärare gällande egenproducerade texter? Tänk dig att du inte bett dem att använda det under en lektion.

2. **ChatGPT feedback.**

Hur upplever du feedbacken som producerades av ChatGPT? Var det givande för eleverna? Var det en stor skillnad på den typ av feedback du brukar ge eleverna själv?

3. **Kunskapsutveckling genom ChatGPT.**

Kan ChatGPT användas på fler sätt än det som observerades för att möjliggöra vidare kunskapsutveckling? Tänk dig då alla 4 förmågor i engelska. Nu var det bara fokus på skrift. Kvar är ju ändå, läs, tal och hör förmågorna. Tror du ChatGPT så som det ser ut nu kan användas till alla förmågor?

4. **ChatGPT påverkan på Elevernas vilja att arbeta?**

Märkte du en skillnad i elevernas vilja att arbeta med det genomförda momentet då de fick möjligheten att använda sig av ChatGPT? Mer benägna att arbeta? Nyfikenhet?

5. **Tilltro till ChatGPT.**

Är du orolig att eleverna litar mer på ChatGPT än dig? Hur uttrycks det av eleverna? Mot bakgrund av att det trots allt finns de elever som tror mycket på det de ser online osv.

6. **ChatGPT underlättande av kognitiv överbelastning.**

Var det någon synbar skillnad i elevernas förmåga att förstå ChatGPTs feedback? Det var ju trots allt några som reagerade negativt på feedbacken de fick. Kan ChatGPT agera stöd för att underlätta ett moment? Kan det förenkla och förtydliga saker för elever? Så att de lättare förstår något som ursprungligen var komplicerat?

### **Avslutande frågor**

1. Skulle du vilja använda ChatGPT i framtiden i din undervisning? Hur?
2. Hur ser du på att ChatGPT kan agera som stöd för elevers språkutveckling både summativt, men också formativt?
3. Har du några idéer om hur man kan implementera ChatGPT i framtida undervisning, för att förbättra elevers skrivförmåga?
4. Är det något mer du vill tillägga?