Teaching English with Technology

Blended Language Learning in Dutch Secondary School

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Abstract

This study aimed to find out how technology can be implemented in English language education in the first three years of Dutch secondary school. Five English classes in a blended learning environment were observed and analysed, including the ICT-tools that were used during these lessons. In addition, an interview with the teacher was conducted to find out more about the combination of online and classroom education. The results showed that, in principle, teaching with technology contains many elements that contribute to effective education. Nevertheless, a practical disadvantage is that blended language learning strongly depends on technical resources, and whenever technology is involved things can go wrong, especially in the classroom. Furthermore, there was also room for improvement, especially for blended language learning, as some crucial elements were missing in the blended language lessons.

In addition, a student survey was conducted to investigate students' perceptions of using technology in the classroom and at home. One group of students received English lessons in a blended learning environment; a comparison group received more traditional lessons without using technology. As the results indicated, the overall perceptions of blended language learning were positive. Students like to work with internet and computers, and find it useful to be able to watch online instruction videos in their own time and pace. The comparison group seemed rather keen to spend more time in the computer room. Both groups also show preferences for using pen, paper and textbook, suggesting that a combination of digital and traditional methods is the best option for them.

For Han, Deen and Tijn

Contents

1 Introduction

Blended learning is rapidly becoming more widespread. Simply put, it is the blending of traditional classroom work with technology, in particular computers/laptops and Information Communication Technology (ICT). The term blended language learning points to the inclusion of technology in foreign and second language education in order to provide as rich a learning environment as possible for language learners. There are a many useful tools and practical guides available for teachers who wish to use technology in their teaching. What seems to be missing, however, is (1) an underlying theoretical framework providing the rationale for choosing the most appropriate ICT tools to support language teaching and learning in the classroom and beyond, with (2) criteria to harness the enormous potential of online technologies and select the best opportunities for blended language learning that (3) serve the needs of language learners.

This thesis aims to shed more light on the question how modern foreign language education can make the most of the enormous potential of online technologies and select the best learning opportunities for language learners. The focus will be on blended language learning and flipping the classroom in the English classes of a Dutch secondary school. Flipping the classroom is a variant of blended learning in which individual homework and class instructions are turned around: students watch instruction videos online, and usually at home, and do their homework in class with the teacher on hand (Strayer, 2012). It is important to note, however, that there is no consensus about what blended learning means, or how to blend, as this methodology is still being developed. Therefore, the most appropriate starting point for blended language learning is the application of principles derived from the theoretical background of second language acquisition (Allum, 2013).

The first two chapters constitute the theoretical framework. Chapter 2 seeks to answer the question: what are "optimal" conditions for successful second language learning in a classroom setting? From there, Chapter 3 considers research focusing on blended learning, and in particular blended language learning. Specific attention will be drawn towards the use of technology within the blend. These two chapters provide the basis for the identification of a set of principles that contribute to the effective use of ICT in the English classroom of a Dutch secondary school. Chapter 4 deals with the research design and research question. Chapter 5 aims to shed more light on the questions "why" and "how" blended language learning takes place in the English classroom. First, the views and experiences of English teacher *Meester Gijs* will be outlined with

respect to the digital side of blended learning, including the ICT-tools he currently uses. Then the results of the classroom observations will be discussed and the tools that were used in these lessons. Chapter 6 highlights the students' perspective on blended language learning and discusses the results of the student survey. A total of 184 students completed a questionnaire concerning their views on the use of computers and laptops in school and at home, how they use technology for learning English, and how they experience working with ICT. Chapter 7 reflects on what is needed to improve blended language learning in Dutch secondary schools. Chapter 8 concludes with a summary of the main points of this study.

2 Effective language education

Blended language learning is not about ICT as a goal, but as a means to enrich language learning and to make it more meaningful and effective. The most appropriate starting point for blended language learning is therefore the application of principles derived from the theoretical background of second language acquisition. In other words, the principles of effective language teaching and learning should always remain paramount (Allum, 2013; Reeves & Reeves; 2013). These principles of effective language education are discussed in this chapter. In this study, the term language education points to learning English as a second language by secondary school students in a Dutch classroom setting. As these students only have two or three English lessons per week, time is limited for language learning in a classroom. Therefore, it is crucial that the instruction and tasks are as effective as possible. As noted above, this chapter will discuss the principles that play a part in effective language education, as well as the theories and research that underpin them.

2.1 Communicative and task-based language approach

Central to theories concerning second language learning is interaction: above all, a language is learned in interaction with others. This is reflected in one of the most relevant learning theories: social constructivism, which states that language develops primarily from social interaction (Vygotsky, 1978). In other words, learning a language is an active process in which learners continuously reorganize their communicative competence through language input and the feedback they receive. Through interaction learners discover new elements in written and spoken language; they build their own knowledge about language and develop their own language skills (Jauregi, 2014: 22).

In the Netherlands, the most commonly used approach to the teaching of a second or foreign language is the communicative and task-based approach. The communicative approach emphasises interaction as both the means and the ultimate goal: *using* the language is the premise. One of the characteristics of the communicative approach is that students develop communication skills; oral and written, as well as receptive and productive. In the classroom, communicative language teaching often takes the form of pair and group work, which requires negotiation and cooperation between learners to perform meaningful tasks in a social context.

Meaning should be primary, but form is also important and should be addressed within a meaningful context (Staatsen, 2009).

This same idea provides the foundation of the task-based approach; the task-based approach focuses primarily on meaning, and uses authentic and meaningful tasks that require learners to use language in ways that closely resemble how language is used naturally outside the classroom. Thus, language is viewed as a tool for communication, whereby fluency is seen as more important than accuracy (Ellis, 2005: 5-6). A task can be defined as a meaningful, realistic activity with clear objectives that that, in a context that is as authentic as possible, should lead to a concrete result or product.

Central to the communicative approach of the CEFR[1] is action-oriented learning. The idea is that learners use language as 'members of a community' in which they perform meaningful tasks in a specific social context. These tasks form the basis of the learning process. In this process, students work independently and use the target language to accomplish language tasks in an open and realistic setting. Crucial is the design of rich learning tasks that contribute to the development of the communicative competencies and language skills of learners.

Tasks can be enhanced by technology creating opportunities for students to engage in online meaningful interactions with peer native speakers. Moreover, internet-based group activities lend themselves to communication, sharing of knowledge and collaborative learning, which favour information exchange and intercultural awareness (Ellis, 2003; Jauregi et al 2011; Nunan, 2004; Thomas & Reinders, 2010; Van den Branden et al. 2009). There are many more reasons for using internet-based tasks and projects in the classroom. Though tasks can be used simply for language learning purposes, they can also be interdisciplinary, allowing for cross-over into other subject areas. This can give students a more 'real-world' look and feel. Moreover, internet-based tasks encourage critical thinking skills. Learners are not only required to find information, but have to transform that information in order to achieve a given task (Dudeney & Hockly, 2007).

[1] Common European Framework of Reference for Languages

2.2 Factors for effective language education

Learning a language is a complex and labour-intensive process which is subject of a vast amount of research and many different theoretical perspectives. A literature review by Ellis (2005) on instructed second language acquisition identifies the following factors that contribute to effective second language education:

(1) a rich learning context, in which learners receive a large amount of comprehensible and varied input in English;
(2) sufficient opportunities to produce English themselves;
(3) instruction that focuses on both meaning and form;
(4) the use of authentic and meaningful tasks to promote interaction and negotiation of meaning between students;
(5) encouragement to use strategies to create meaning;
(6) the provision of appropriate feedback to students' English language production;
(7) a focus on an intercultural context.

These principles will be further examined, based on theories and research that underpin them.

(1) Input

The first characteristic of effective language education is a rich learning context, in which learners receive a large amount of comprehensible and varied input in English. To contribute to communicative competence, it is important that the input in the second language is "rich," i.e. "authentic, multimodal,[2] and contextually relevant" (Jauregi et al., 2011: 78). Moreover, successful instructed language learning requires extensive input in the target language. As mentioned previously, language learning is a slow and labour-intensive process, whether it occurs in a naturalistic or an instructed context. Children acquiring their first language take between two and five years to achieve full grammatical competence, during which time they are exposed to massive amounts of input. Thus, if learners do not receive exposure to the target language they cannot acquire it. In general, the more exposure they receive, the more and the faster they will learn (Ellis, 2005). Not only quantity matters, but also of the quality of input.

[2] Multimodality implies the use of different modes of communication.

Krashen (1985) claims that comprehensible input, together with motivation, is all that is required for successful language acquisition. However, the input must be made 'comprehensible' either by modifying it or by means of contextual attributes. To ensure access to adequate input, teachers need to maximise use of the second language inside and outside the classroom. English needs to become the medium as well as the object of instruction (Ellis, 2005: 38-39).

(2) Output

Central to developing second language proficiency is the opportunity to interact in the second language because social interaction is the breeding ground for language acquisition. Therefore, students also need sufficient opportunities to produce English themselves. Swain (2000) shows that although input is important in language learning, it is the act of producing language that focuses the learner's attention on "what he or she did not know, or knew imperfectly" (p. 100). Swain's "comprehensible output hypothesis" suggests that collaborative tasks are the best way to get students to produce comprehensible output, because when working together students need to negotiate meaning, and as a result are supported in producing comprehensible output beyond their own individual level of competence. Thus, interactional exchanges and negotiation of meaning contribute to language development.

In fact, an important reason for incorporating tasks into language education is to create opportunities for output. Research has shown that extended talk of a clause or more in a classroom context is more likely to occur when students initiate interactions in the classroom and when they have to find their own words. As many students feel insecure about speaking in front of a lot of people, interacting in small groups helps them to express themselves in their own ways and practice speaking the language (Ellis, 2005: 39-40). Nowadays, technology can facilitate this by making it easier for different groups of learners from different parts of the world to talk to each other, especially through telecollaboration (Motteram, 2013: 48).

(3) Focus on meaning and form

Many research findings indicate that effective language education requires learners to both attend to form and meaning (Ellis, 2005). Long's "Interaction Hypothesis" entails that "negotiation of meaning" provides the optimal conditions for foreign language acquisition (cited in Ellis, 2005: 6). When one interlocutor does not understand the other, communicative strategies have to be applied to re-establish comprehension. This implies for instance that discussion

partners will have to speak more slowly, change their intonation, or use different words to clarify what they mean. Subsequently, the feedback on their language use, as well as the extra input, help both speakers to further develop their oral language production skills.
Schmidt (1994) states that "there is no learning without conscious attention to form" (cited in Ellis, 2005: 35). There are a number of ways to focus on form, for instance through grammar lessons. Grammar is a 'means to an end' whereby two approaches can be distinguished: a deductive and an inductive approach. A deductive approach means that the teacher explains the grammar rules explicitly, after which the students will apply these rules during a grammar exercise. The deductive approach can be seen as direct and efficient, form-focused, and without a context or communicative purpose. An inductive approach, on the other hand, means that the students find out the grammar rules themselves by recognising certain grammatical patterns. The inductive approach involves more meaningful communication, problem solving and higher cognitive skills (Thornbury, 1999; Ur, 2009).

(4) Tasks

Tasks are a key issue within second language education. Authentic, meaningful tasks that promote interaction and negotiation of meaning between students form the base of the language learning process (Ellis, 2003; 2005). However, without exercises language learning would lack focus on form, which is also crucial for language learning. Within task-based teaching, exercises should be integrated as part of the task, in particular in the pre-task phase, so that 'meaning and form' are integrated.

What makes a task effective? Research shows that a good task instruction (or pre-task) is crucial: by watching instruction videos, for instance, prior to a task or lesson, students understand the objective better and therefore perform better (Ki & McDonough, 2011). Tasks that contribute to second language learning are those that promote interaction between students (Peterson, 2010); contain meaningful activities, an end product and are guided by the teacher on form and content (O'Dowd & Waire, 2009); and lead to rich input and focus on improving communicative and intercultural competence (Jauregi, Canto, de Graaff, Koenraad & Moonen, 2011). In sum, an effective task can be defined as a meaningful activity that relates to the real world, with clear instruction and objectives, teacher guidance, and leading to a concrete result. Although task-based teaching needs to ensure that learners are primarily focused on meaning, it must also find ways of helping learners to attend to form.

With technology moving on at an astounding pace, it is important to investigate ways in which technology can be used to enhance second language learning. There is a growing field of research studies focusing on technology enhanced tasks (for instance Jauregi, 2011; Thomas & Reinders, 2010). As a learning environment, the internet offers a great many opportunities for in which learners can engage in text and chat activities connected with collaborative learning and knowledge-building. Furthermore, constructivist approaches which underline the importance of collaborative or social engagement as the basis for learning have been closely identified with the use of internet applications in education (Thomas & Reinders, 2010).

(5) Communicative strategies

Another characteristic for effective language education is the encouragement to use strategies to create meaning. As mentioned previously, according to Long's "interaction hypothesis", negotiation of meaning provides the optimal conditions for foreign language acquisition. When one interlocutor does not understand the other, communicative strategies have to be used to re-establish comprehension, which implies for instance that discussion partners ask for repeating the sentence or speaking more slowly, or use paraphrases to clarify meaning. The feedback on language use as well as the extra input helps both speakers to further develop their oral language production skills. Moreover, when discussions take place in pairs, it provides better conditions for negotiation of meaning than group discussions (Foster, in Peterson, 2010).

(6) Feedback

The provision of appropriate feedback to students' English language production is another prerequisite for effective language learning. Research shows that second language learners not only need examples of correct language use, but also need to know what is not correct. There are various forms of corrective feedback, which differ in explicitness. Implicit feedback models the correct form without explicitly indicating that the student has made an error, while explicit feedback makes it clear to the student that an error has been made. Seedhouse (2001) suggests that although many teachers show preference for implicit feedback, explicit feedback is better for learning. Several studies state that "for corrective feedback to have any effect in the classroom it has to be sufficiently explicit for students to notice what is being corrected" (Ellis, 2005: 21).

Which type of feedback is more effective also depends on the communicative orientation in the classroom (Lyster & Mori, 2006):

(1) Recasts - the teacher repeats the student's utterance in the corrected form - are effective for learners in classroom settings in which the communicative orientation permits regular opportunities for controlled production practice;

(2) Prompts - the teacher does not give the right form, but brings the student to think and find out what it could be - are effective for learners in classroom settings in which the communicative orientation does not favour opportunities for controlled production practice.

(7) Focus on an intercultural context

Language and culture are intrinsically intertwined and come together in social interaction. For secondary school students, the connection between language and culture is probably less self-evident because of the lack of direct contact with the target culture (Jauregi, 2014: 14).
Yet, authentic communication in the target language always runs in an intercultural context. This requires specific knowledge, skills and attitudes from the interlocutors. The purpose of language learning is not only to match the native speaker, but to create intercultural speakers (Jauregi, 2014: 22). For the Central Framework of European Reference[3] the importance of culture and intercultural awareness is a central theme, and there is a shift from communicative competence towards intercultural competences. This has become even more important in the twenty-first century, in which globalisation has resulted in increased intercultural communication.

Moreover, it is often stated that by learning foreign languages students have the opportunity to become familiar with other cultures. Such insights contribute to other ways of thinking and provide the foundation for intercultural awareness, respect and increased tolerance (Staatsen, 2009: 206; Byram, 2012: 90). Technology offers one of the best opportunities to develop the intercultural communicative competence of students by means of online intercultural exchange or telecollaboration. By participating, students become more aware of important aspects of another culture and develop cultural awareness by exchanging information about their own cultures. For instance, online video chats can be used to correspond with English learners from other countries to create this awareness and the intercultural skills that are necessary to communicate (Canto, Jauregi, & van den Bergh, 2013).

In a globalised and multicultural world with advanced communications technologies, intercultural competencies are important. Digital communication technology is an enormous enrichment for the development of intercultural language skills. It offers opportunities to internationalise education, and to interact and collaborate with learners from other countries on joint projects. This way, they are able to improve their intercultural and communication skills in a rich learning context (Jauregi, 2014: 22-29).

Therefore, a focus on the intercultural context is the last, but not the least, factor that contributes to the effectiveness of second or foreign language education.

2.3 English language education in future perspective

The global spread of English has had widespread linguistic, social, and cultural implications, affecting the lives of millions of people around the world. Today, English is used worldwide, in different broad-ranging societies and in various forms and roles. Nearly every speaker or learner of English has been exposed to different varieties of global English, as accents from all over the world are frequently heard in the media, for instance by watching an American sitcom, or by listening to an interview with an African politician (Schneider, 2011). Moreover, many people have embraced English as a *lingua franca*[4] to communicate with interlocutors from different cultures. However, in English language education the focus is still on the native speaker, while English is mainly used as a lingua franca in today's society. Therefore, English language education in the Dutch secondary school classroom needs to focus more on internationalising, English as a *lingua franca*, intercultural awareness and an enriched learning context. In this respect, the use of online technologies becomes increasingly important (Jauregi, 2014).

Summary

To accomplish effective language education, certain elements are essential in the English classroom. First of all, it is important that learners receive a large amount of comprehensible and varied input in English in a rich learning context, in which there are sufficient opportunities to produce English themselves. Secondly, instruction and tasks should focus on both meaning and form. Thirdly, tasks and exercises should be as effective, authentic and meaningful as possible,

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[3] Europees Referentie Kader (ERK), 2001.
[4] A *lingua franca* is a language used to communicate between speakers who speak different languages as their mother tongue (Schneider, 2011: 240).

motivating students to use English in a ‘natural’ way. Fourthly, interaction and collaboration between learners are essential elements for second language learning and stimulate the use of strategies to make themselves understood in spoken and written English. Fifthly, students need constructive feedback that both focuses on meaning and form. Finally, enhancing communicative and intercultural competences are important elements of modern foreign language education. This can be accomplished by blending in technology and telecollaboration into the curriculum. The principles of effective second language education, as described in this chapter, should always remain paramount.

The next chapter will discuss the principles more specifically related to the implementation of blended language learning.

3 Blended Language Learning

The principles described in Chapter 2 would apply to a wide range of language learning tasks, not only those in which technology is involved. They are thus general principles of second language learning. This chapter will outline the principles of blended learning: a combination of online learning with technology and traditional face-to-face instruction in the classroom.

3.1 Blended learning opportunities for language learners

Second language education mainly takes place in the classroom, and achieving the optimal conditions as just presented poses a significant challenge in Dutch secondary school, where students have limited time and opportunities to actively engage in using English. Surrounded by Dutch native speakers, they rarely have the opportunity to enter the world of the target language, despite the best efforts to use communicative, authentic language tasks in the classroom. Online technologies, such as internet and social media, provide new ways for communication and collaboration, and offer an almost limitless variety of activity types for collaborative learning with group and pair work, as well as self-study resources designed for independent learning. Technology is considered an important ingredient in any language learning curriculum today. Moreover, the current generation of students have grown up with online technology and "expect" to use ICT in and outside the classroom as part of the learning process (Marsh, 2012: 2).

The concept of blended learning has been around for a long time: the most effective education has always involved the use of different methods, approaches, and strategies to maximise knowledge acquisition and skills development. What is new is the range of different learning opportunities and environments made possible through the use of online technology to support learning and teaching. Today blended learning can refer to any combination of different learning methods, styles and environments (Marsh, 2012: 3). This is reflected in recent research literature: there is no consensus about what blended learning means,[5] or how to blend. Blended learning is defined, modelled and implemented in multiple ways.

[5] For instance, Stracke describes blended learning in relation to her study into why learners leave blended learning courses as follows: "a particular learning and teaching environment, that combines face-to-face and computer assisted language learning (CALL)" (2007: 57). Dudeney and Hockly substitute CALL with "online" and define blended learning as a "mixture of online and face-to-face course delivery (2007: 137), and Sharma and Barrett use "technology" instead of CALL and state that "blended learning refers to a language course which combines a face-to-face classroom component with an appropriate use of technology (2007: 157).

In this study, blended learning refers to second language education that combines classroom teaching and learning with the use of technology. This includes the use of ICT, internet, tablets, smart phones, computers and laptops in school and at home.

The rapid growth in the use of learning technologies, particularly the use of the internet and social media, is providing language teachers and students with many more opportunities for blended language learning (Marsh, 2012). As mentioned previously, learning a language is an active process in which learners continuously reorganise their communicative competence through language input and the feedback they receive. Learners discover new elements in written and spoken language, construct their language knowledge and develop their language skills, first and foremost, through interaction (Jauregi, 2014: 22).

Research findings suggest that blended learning is generally effective (Allum, 2013), and leads to better results than online learning or face-to-face learning alone (Van de Sanden, 2013). The question is: how can blended learning create learning opportunities for language learners?

3.2 Best of both worlds

There are many benefits of using ICT for language learning, but the incorporation in the blended learning environment needs careful consideration and should not wipe out the advantages of more traditional methods and materials because both ‘worlds’ have their benefits. It is important that the possibilities of both the online and face-to-face part of a blend are used optimally used, and that both parts cohere sufficiently (Van de Sande, 2013).

The most important aim of blended learning is to find the most effective and efficient combination of learning modes to create a learning environment that works as a whole. Blended learning means choosing the best of both worlds to achieve the best learning environment possible.

The next sections will focus on both the strengths of blended language learning and the benefits of traditional learning methods.

A. Benefits of ICT for language learning

The following strengths of blended language learning have been identified (Marsh, 2012: 4-5):

- promotes independent and collaborative learning;
- increases student engagement in learning;
- accommodates a variety of learning styles;
- provides a place to practice the target language beyond the classroom;
- provides a less stressful practice environment for the target language;
- provides flexible study, anytime or anywhere, to meet learners' needs;
- offers an environment to develop twenty-first century learning skills.

ICT provides new ways for communication and collaboration, which is very important when learning a language. It also offers an almost limitless variety of activities for collaborative learning and online intercultural exchange between students from different cultures.

ICT for communication, collaboration and intercultural exchange

ICT provides new ways for communication and collaboration, which is crucial when learning a second language, and offers an almost limitless variety of activities for collaborative learning with group and pair work, as well as self-study resources for independent learning. Moreover, ICT can contribute to the effectiveness of task-based learning. For instance, instruction videos are very helpful prior to performing learning tasks (Ki & McDonough, 2011), and computer mediated communication promotes learner interaction in groups or pairs (Peterson, 2010).

Furthermore, the use of video chats, or Skype, gives students the opportunity to communicate with people (and peers) from other countries. Research has shown that the use of such tools is motivating and useful for the participants, and that it improves their "confidence, fluency and knowledge about the target culture." They "speak better, learn more vocabulary and understand more" (Canto, Jauregi, van den Bergh, 2013: 113). In addition, intercultural competencies are very important in a globalised and multicultural world with advanced communication technologies. Online communication with people (or peers) from other countries also creates awareness towards other cultures and the intercultural skills necessary to communicate, as the purpose of language learning is not only to match the native speaker, but "to create intercultural speakers" (Jauregi, 2014: 22).

Incorporating telecollaboration projects into the curriculum therefore seems a logical step in fostering students' intercultural communicative competence. With these online projects students become: (1) aware of the important aspects of other cultures through personal contact; (2) develop cultural awareness through the exchange of information about their different cultures; and (3) become aware of the existence of culture-specific communicative manners. Moreover, through contact with a real person, students are also more motivated to use the target language. It should be noted that telecollaboration projects must be meaningful and focus on the social and cultural aspects of language learning. O'Dowd and Waire (2009) have identified three categories of telecollaborative tasks that would be represented in such a project: (1) information exchange; (2) comparison and analysis; and (3) collaboration and product creation.

Chaoa and Lob (2011) argue that collaborative writing[6] is a useful way to enhance students' productive writing skills. Computer mediated communication offers learners "considerable opportunities to write and communicate beyond the time constraint and the onsite classroom", which expands "the limited course time to online writing after class" (p. 397). The study also shows that the writing process is enhanced when students work in groups. Because it is computer based, students like this type of writing task, revise more continuously and enthusiastically, and invest more time in the task. Furthermore, as this approach is more informal, online collaborative writing projects could also reduce students' anxiety to fail.

Blogs (short for weblogs) are another ICT application that offers a way of using English outside of the classroom; students can work on their writing anywhere they want as long as they have a computer. Blogs are a form of asynchronous communication, taking place outside of real-time, which means that the user has time to think about what he/she wants to write and how he/she wants to react when someone responds. Furthermore, when blogs are written in groups, it can create a sense of belonging because the participants share information about their lives (Tiziana Micelia, Visocnik Murray & Kennedy, 2010).

In sum, there are many benefits of using ICT for language learning, but it is important to blend the best of both worlds, as the advantages of 'old' methods should not be wiped out. The next paragraph aims to shed more light on the benefits of traditional methods and materials.

[6] Here, a Wiki-based collaborative approach to the writing process for EFL (English as a foreign language) learners.

B. Benefits of pen and paper

In many cases, the tangible pen and paper prove to be more effective than digital material. More and more scientists warn that the paper book should not be traded in for a screen without careful consideration, as “there is still a lot of life in those dead trees” (Vermeulen, 2014: 35-37).

The study "The pen is mightier than the keyboard”, by Mueller and Oppenheimer (2014), highlights the advantages of traditional learning material and argues that writing by hand is far from outdated because “who writes, remembers better”. In the study, 65 students had to watch *TED talks* and take notes. Half of the group made notes on a laptop, the other half with pen and paper. After the online lectures, the students had to answer a number of questions. The students who made notes on paper scored better on the test. The researchers suggest that laptop students tend to type the information they hear quite literally, whereas the 'paper' students are forced by the pressure of time to write down the information selectively and schematically. Those with the most literal notes scored the worst on comprehension questions. The researchers conclude that pen and paper are good for our memory and that students who write notes by hand perform better than those who use laptops. Therefore, the researchers argue that notes should be taken by hand, and not on a laptop (Mueller & Oppenheimer, 2014).

In addition, several studies show that when it comes to reading comprehension, reading from paper leads to better results than reading from a screen. Norwegian researcher Mangen assigned 72 students (15 or 16 years of age) randomly to two groups. One group had to read texts on paper; the other group read the same texts (as pdf) on a computer screen. Based on these texts, the students had to complete a reading comprehension test. The results show that the ‘paper’ students scored significantly better than the ‘screen’ students (Mangen, 2013).

A literature study by Jabr (2013), concerning studies over the past twenty years, also shows the benefits of paper over computer screens. The main conclusions are that screens limit the options to organise texts intuitively, making it harder ‘to save’ long texts in the brain. Reading from a screen is cognitively and physically more exhausting than reading from paper. The 'scrolling' requires extra attention which is at the expense of reading. With screens you have to focus where you are in a text because you get lost more easily. Furthermore, screens of tablets and laptops are tiring to the eyes and may cause headaches after prolonged use (Jabr, 2013).

Research conducted by Ackerman and Goldsmith (2011) reveals that ‘paper’ readers take a lot more time to read and study than ‘screen’ readers, and therefore perform better on a test. Apparently, people use a computer screen with a different attitude: they read selectively and scroll through the text. Paper is taken more seriously than a screen, so it seems. This implies that paper is the most suitable medium when students have to study (Ackerman & Goldsmith, 2011).

Some studies touch upon the downsides, or areas of concern, of integrating technology in the classroom. For instance, Stracke (2007) conducted a study from the participants’ perspective to find out why learners drop out of a blended language learning environment, and focused on three learners who left the class. The students left for three reasons: (1) a perceived lack of support and connection, and the lack of complementarity between the face-to-face and computer-assisted components of the blend; (2) a perceived lack of usage of the paper medium (course book and printed material) for reading and writing; and (3) the rejection of the computer as a medium of language learning. Stracke concludes that it is important to be aware of these areas of concern as discussed in her study. Moreover, the differing views, beliefs and attitudes of students are part of any learner-centred approach and must be taken into account. Ignoring them will lead to resistance and thus encourage reluctance and ineffectiveness (Stracke, 2007: 75-76). Therefore, the issues mentioned above are also addressed in the student survey (Chapter 6).

To conclude, the most important aim of a blended learning is to find the most effective and efficient combination of learning modes to create a learning environment that works as a whole. Blended learning means choosing the ‘best of both worlds’ in order to achieve the best learning environment possible.

3.3 The role of the teacher

This section describes the specific role of the teacher in the blended learning environment. Chen and Jones (2007) argue that in a learner-centred classroom, students are actively involved in the learning process; do not depend on their teacher all the time; communicate with each other in pairs and small groups and value each other’s contributions; cooperate, help and learn from each other. The role of the teacher in this learner-centred setting is to guide students, manage their activities, direct their learning, and help students develop their language skills (Marsh, 2012: 9).

In addition, the teacher has to select, adapt, and perfect educational activities that maximise the opportunities of technology and the internet, aiming to create "learning-, knowledge-, assessment-, and community-centred educational experiences that will result in high levels of learning by all participants" (Anderson, 2008: 68). In a blended learning classroom, the teacher's role shifts towards being the organising and designing force that brings students' online and classroom learning together. This role should not be underestimated and requires training and support.

Furthermore, in blended learning, there is more reliance on student self-directed learning. Students need to adopt and use learning strategies that are different from what they are used to in the more traditional, face-to-face classroom environments. The teacher, therefore, needs to help students take on the responsibility for their own learning. The computer skills of students are generally quite good, so it is likely that the "technical" and actual use of computer technology does not present a major challenge when introduced into the students' learning environment (Marsh 2012: 9). Teachers, on the other hand, typically point to the practical implications regarding the technical part of blended learning (also described by Canto, et al., 2013).

Chapter 5 portrays a teacher who incorporates ICT as much as possible in his teaching.

3.4 Principals for blending technology

This paragraph will consider how blended learning can help achieve the optimal language learning environment. It will examine the criteria and factors that can help to find the most appropriate blend for English language learners in Dutch secondary school.

Based on what emerges from the literature as important factors influencing the effectiveness of using technology in combination with blended learning, five main criteria can be identified. These criteria are based on what Reeves and Reeves (2013) call "core strategies that teachers should follow when designing and teaching online or blended subjects" (p. 113). Literature on effective learning and blended language learning provided the additional arguments.

Five main criteria for the most effective and efficient blended language learning are:

(1) Focus on the principles of effective teaching and learning
(2) Selective use of technologies
(3) Alignment of the crucial components to achieve effective blend
(4) Maintenance of teaching presence, social presence and cognitive presence
(5) Supportive environment with opportunities for feedback and communication

These principles will be considered in detail, based on theories and research that underpin them. It should be acknowledged, however, that there is no simple recipe for a "perfect" blend, yet there is a number of important factors that contribute to an "effective" blend. These principles also help to harness the enormous potential of online and blended learning and select the best opportunities for blended language learning.

(1) Focus on the principles of effective teaching and learning.

First and foremost, the principles of effective language teaching and learning remain paramount, keeping pedagogy ahead of technology (Allum, 2013; Reeves & Reeves; 2013). These principles of effective language education are discussed in Chapter 2.

In addition, as Hattie (2009)[7] concludes, the foundational building blocks of *any* learning environment, whether face-to-face, completely online or in a blended form, should include:

- *Clarity in content and objectives*. Students require explanation for most learning goals: if students understand why they should learn specific things, their learning becomes more effective (Ebbens & Ettekoven, 2013: 20-21). Similarly, subject matters offered online will not be effective unless the design provides clear instruction and explanations (Angelo, 2013).
- *Sufficient challenge for students*. Tasks should be of an appropriate difficulty. If a language level in a task is too easy, some students are unlikely to improve; if the task is too difficult, some students may simply give up (Marsh, 2012).
- *Time-on-task*, also known as engaged time, is the amount of time actually spent learning. This depends on good classroom management and highly interactive teaching styles: the more engaged time students have, the better they achieve (Slavin, 2003).

- *Timely feedback to students*: When feedback is provided too soon it may stop students reflecting on their work themselves; if it is provided too late it may no longer be relevant. Whether in a face-to-face, completely online or in a blended context, feedback needs to be timely and relevant to the learner's needs in order to be effective (Angelo, 2013).
- *Positive relationships between teacher and students.* The factors with the largest effect on student achievement are (1) the quality of the teaching and (2) the nature of the teacher-student relationships. Teachers using particular teaching methods, who have positive student-teacher relationships and high expectations for all students, are more likely to have a positive impact on student achievement (Hattie, 2009).

(2) Selective use of technology

A practical disadvantage of blended language learning is that it strongly depends on technical resources, and whenever technology is involved things can go wrong. Simply put, when it does not function properly, it becomes counterproductive. The technical and organisational implications of integrating technology in the curriculum seem to be an important reason for teachers to refrain from using ICT in the classroom (see for instance Canto et al., 2013). New technologies and social media should therefore be selectively adopted into online and blended learning. Also, when students must constantly start, stop, and re-acquaint themselves with the technology, learning is inhibited. Technology tools need to be reliable, easy to use, and up to date in order to have a meaningful impact on learning and teaching. Additionally, ICT literacy can serve as a significant barrier for students attempting to get access to the course materials, making the availability of technical support paramount (Alexander, 2010).

Saliently, according to Hattie's analysis, some of the least effective strategies and programs are among the favourites of proponents of educational technology, such as: computer assisted instruction; simulations and games; audio-visual methods; programmed instructions; and web-based learning. It should also be noted that telecollaboration projects must be meaningful and focus on the social and cultural aspects of language learning.

Moreover, not all forms of technology are suitable for everyone, and some students learn better using specific techniques or tools. Individual differences between students, such as motivation,

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[7] Much of the evidence about the fundamentals of effective teaching and learning is summarised in Hattie's important book *Visible Learning* (2009), an evaluation of more than 800 meta-analyses about education.

aptitude for language, learning styles and learning strategies play a prominent role. Students like to use different media and methods (see also Stracke, 2007). Newer technology and older media should therefore both have a place in blended language learning, so that students can use different media and choose the tool that best suits their needs (Marsh, 2012: 7).

In essence, technology in online and blended learning should only be used to contribute to the overall effectiveness of teaching and learning. Learning with ICT can be highly effective if students are provided with methodologically sound and easy to use tools, clear explanations, opportunities to practice, and timely feedback (Reeves & Reeves, 2012: 114). It is also advisable to regularly evaluate the various instructional designs and technological components of the online or blended subjects, so that its effectiveness can be optimised. This can be done in cooperation with experts, colleagues and students.

In sum, selecting the most suited technology and tools is crucial for blended language learning. ICT tools must be (1) reliable, easy to use and up to date; (2) an added value for learning goals; (3) varied and blend 'the best of both worlds'.

(3) Alignment of components to achieve a coherent and effective blend.

To achieve a coherent learning experience, it is important for the different components of the blend to complement each other. A mismatch between the various components can lead to confusion and frustration on the part of the students and increased workload for the teacher who has to bring the disparate components together. Establishing complementarity starts with identifying the learning outcomes, the students' needs, and how these learning outcomes and needs can be supported by the various components (Marsh; 2012: 6).

Reeves and Reeves (2013) focus, as noted above, on the seven components of a subject that must be aligned: objectives, content, model of instruction, learner tasks, teacher roles, technology roles and assessment. For instance, online technologies such as cognitive tools, visualisation software, simulations, and interactive resources have enormous potential, as long as they are aligned with an appropriate instructional model (Reeves & Reeves, 2013: 118).

All in all, an effective blend requires maximal alignment of the various components, such as:

- Clear and meaningful learning objectives.
- An appropriate and clearly structured instruction model to achieve those objectives.
- A learner-centred approach, taking into account the learner's pre-knowledge, perceptions, needs, interests, and learning styles (Staatsen, 2009).
- An active role for learners, who can work independently and engage in self-monitoring, self-evaluation and self-assessment (Hattie, 2009).
- Selection of the most effective instruction model, in which the teacher takes an active rather than a purely facilitative role (Hattie, 2009).
- Selection of appropriate technology to complement and support the learning process.

(4) Maintenance of teaching presence, social presence and cognitive presence

Research has shown that blended language learning is more successful when the presence of teaching as well as the social and cognitive presence is established and maintained in the blend. One of the most important models to explain the learning process in online environments is the community of inquiry framework (COI), developed to guide the research and development of online learning (Anderson et al., 2001). This framework is grounded in two primary theories: constructivist learning and collaborative learning, which is in line with the learning theory of social constructivism, i.e. language develops primarily from social interaction (Vygotsky, 1978).

The COI consists of three elements of "presence": (1) teaching presence, (2) social presence and (3) cognitive presence. These three forms of "presence" must be attended to within teaching and learning online, and coalesce to create a meaningful learning experience. *Teaching presence* can be defined as "the design, facilitation, and direction of cognitive and social processes for the purpose of realising personally meaningful and educationally worthwhile learning outcomes" (Anderson et al., 2001, p. 5). In other words, in the online learning environment the teacher is responsible for creating a learning experience and guide students' online learning.

Cognitive presence relates to the design and development of instructional materials, enabling students to move through the learning process. From the cognitive presence perspective, the teacher must seek to ensure that all learners comprehend their roles and responsibilities within the overall learning environment. This means for instance, that the seven components (objectives, content, model of instruction, learner tasks, teacher roles, technology roles and

assessment) not only need to be aligned from the teacher's perspective, but also have to be explained to the students, for instance via a tool for online communication, such as a discussion forum. The capacity to collaborate is important for all students. Although small group collaboration heightens cognitive presence within a subject, most learners need support to collaborate effectively (Reeves & Reeves, 2013: 12). There are several ways to support online or blended collaborative learning, which include:

- Providing opportunities for establishing positive interdependence by making sure that each group member does an equitable share of the group work.
- Enhancing individual accountability, motivation and engagement by acknowledging the positive collaboration of individual participants (by posting a positive comment for instance).

From the *social presence* perspective, it is important that the teacher is in rapport with the students and establishes a clear and open way to communicate online. This can be achieved by using social media tools, such as Twitter, to keep students aware of the teacher's engagement and nurturing a sense of cohesion among the students. Moreover, online discussions are especially important within the context of completing authentic tasks in collaboration with other students. Research has shown that online discussions within the context of completing authentic tasks are "both natural and productive because learners must engage in rich, meaningful discussions to accomplish their collaborative work" (Reeves & Reeves, 2013: 124).

In sum, to enhance effective learning, it is essential to establish and maintain the cognitive, social and teaching presence within the online or blended part of the learning environment.

(5) Supportive environment with opportunities for feedback and communication

An online or blended learning environment requires a supportive environment, with opportunities for feedback and communication. Blended language learning also aims to foster independent learning, but not every student is capable of doing so. A supportive online community should provide the encouragement needed when students face their computer screen at home or in the classroom. A friendly, social online environment, plus tools that promote the communicative use of technology, are vital in supporting students and therefore essential for successful online learning. There are also tools available that report learner progress, and provide the teacher with a good overview of who is falling behind or needs help. These tools also offer

the opportunity to provide support without drawing attention to it in class, in particular with quieter students who often get overlooked in the busy classroom (Marsh, 2012).

In the classroom, the teacher is on hand to answer questions as they arise. In an online forum, this can be carried through for different activities where students are invited to ask about issues they find difficult. Whereas e-mail only encourages student-to-teacher interaction, a forum supports peer-to-peer and group interaction. Classmates are empowered and encouraged to respond to their peers' questions, which can provide considerable satisfaction for the person answering the question. As well as helping the questioner immediately, it also reinforces the idea that the teacher is not the "source of all knowledge" and creates a sense of community and peer support in general. The role of the teacher is to monitor this interaction and decide how best to manage it, but not direct or lead the interaction (Marsh, 2012: 10-11).

Summary

Effective language education in online or blended environments requires a multidimensional approach. First and foremost, the principles of effective language teaching and learning remain paramount (see Chapter 2), keeping teaching methodology ahead of technology. Secondly, teachers should be very selective about adopting new technology and social media tools into their online and blended subjects. Thirdly, in the online or blended learning environment, it is important to maintain effective levels of cognitive, social and teaching presence within a subject. Fourthly, the several critical components of the online or blended learning environment must be aligned, such as learning objectives, content, instructional design, learner tasks, teacher roles, technology roles and assessment. Finally, an online or blended learning environment requires a supportive environment, with opportunities for feedback and communication. These five principles will not guarantee a perfect blend, but are important factors that contribute to an efficient and effective blended learning environment because, in the words of Neumeier (2005): "The most important aim of a blended learning design is to find the most effective and efficient combination of learning modes for the individual learning subjects, contexts, and objectives. The focus is not to choose 'the right' or 'the best,' 'the innovative' as opposed to 'the traditional'; but to create a learning environment that works as a whole" (p. 164–65).

4 Research design

This section will describe the research question of the study, the context of the school and classrooms where this research took place, and the methods that were used in this study.

4.1 Research question

The research question of this study is: how can teachers harness the enormous potential of online technologies and select the best options for blended language learning? To answer this question five English lessons in a blended language learning environment were observed and analysed, as well as the ICT-tools used in these lessons. Since five lessons are not necessarily representative for his other lessons, an interview with the teacher was conducted to find out more about the way he is teaching English with technology. The final part of this study investigates the perceptions of students on the use of ICT in the classroom and beyond.

The following sub-questions guided this study:

(1) What are the views of "Meester Gijs" on teaching English with technology?
(2) Which ICT-tools are used in his blended language learning classroom?
(3) How are the principles that are considered important in effective blended language learning implemented in the observed English lessons?
(4) What do students think of working with computers and digital tools in school and at home?
(5) How do students use computers/laptops and internet in general and for language learning?
(6) What do students prefer in the English classroom: computer or textbook, pen or paper?

4.2 Context

The study was carried out in a Dutch secondary school, the *Veluws College Walterbosch* in Apeldoorn. The school is part of a school community consisting of four different locations. This particular location houses havo, vwo and gymnasium. On its website, the school explains that it is important that students are well prepared for their future, so ICT plays an important in their education. With a wireless network, interactive whiteboards in all classrooms, an electronic learning environment, a laptop for every student, the school teaches students' digital skills and ICT literacy. Most of the class time, students are taught according to traditional methods, but digital education is being developed and will increasingly be integrated in the years to come.

Gijs Palsrok or "Meester Gijs" is English teacher and ICT coordinator at the *Veluws College Walterbosch.* He is a strong advocate of social media and ICT applications inside and outside the classroom. He incorporates ICT in his lessons and flips the classroom on a regular base. In September 2013, he has launched his own website: *www.meestergijs.nl*. This website aims to help students improve their English skills and grammar by means of videos, presentations and exercises. Not only his students make use of the site, but schools and students all over the country appear to be regular users too.[8] Just six months after the site's launch, the number of visitors rocketed to more than 9000 in May 2014. During the test weeks there were sometimes over 1000 students online using the website to learn and practice. Moreover, students utter their appreciation for the site posting comments, such as: "Thank you, now I finally understand" and: "We use your site a lot in class, and it really helps."

The site is especially intended to support students outside the classroom, so that they can have an extra look at the subject matter or practice their skills at any time that suits them: "moving education beyond bell-to-bell". In the classroom, the site serves as a starting point and platform for the teacher's lessons. Before each class, Gijs makes sure that the learning materials, exercises and for instance quizzes are uploaded and "stand by".

4.3 Instruments and methods

Three methods were used in this study to gather data: (1) classroom observation (2) interview and (3) questionnaire.

4.3.1 Classroom observation

For the classroom observation, five English lessons of 50 minutes each were observed by means of an observation scheme, consisting of two parts. Part A of the scheme was kept as open as possible. In the first column each event and activity of the five lessons was timed and listed in minutes, followed by two columns to write down the activities the teacher and students were involved in at that particular period of time. The third column leaves room to describe the work form, for instance plenary instruction, individual or small group work, or whole class activity. Part B of the scheme includes several important aspects to pay attention to while observing: the

[8] Gijs posted for instance: "Nice! Harlingen is with 27 students and Sneek with 25 students on www.meestergijs.nl. If you have any questions, please let me know!"

role of ICT, individual differences, student motivation, student interaction and teacher feedback. Both parts of the observation scheme can be found in Appendix A.

Overview observation lessons

	Class	*Name*	*Room*	*ICT*	*Number of students*
1	2 vwo	2A1	Computer room	+	21
2	2 havo	2H2	Class	+	26
3	3 havo	3H2	Class	+	23
4	2 havo	2H1	Class	+	20
5	3 havo	3H1	Computer room	+	17

For the analysis of the lessons a list of criteria was composed, which is displayed in Appendix B. The criteria, which are formulated as questions, are based on what emerged from the research literature as important factors influencing the effectiveness of using technology in second/foreign language education, as discussed in Chapters 2 and 3. The list also contains a few general questions about the aim of the lesson, the tasks and exercises, and the ICT-tools used.

4.3.2 Interview teacher

After each lesson an interview was conducted with the teacher. Questions were asked to find out (1) why he integrates technology in his teaching; (2) how he implements ICT in and outside the classroom; and (3) what ICT-tools he uses and with what purpose. In addition, more specific information about the tools and views of the teacher was retrieved from the teacher's website (www.gijspalsrok.nl). The interview, the description of the various tools, and the classroom observations will be presented in Chapter 5. Some of the teacher's contemplations and considerations were included in the students' questionnaire, which will be discussed in the next paragraph.

4.3.3 Student questionnaire

The third method in this survey is a questionnaire. The questions, which are formulated as statements, serve to shed more light on the students' experiences with the use of ICT-tools in class and at home. Internet, smartphone, tablet, laptop, web-based tools are also included, as well as computer software, such as Word and PowerPoint. In total, 24 statements were formulated, focusing on the following categories (see Appendix C):

- Students' use of computers and internet in class and at home;
  with 9 items relating to this category (questions 1, 2, 3, 5, 6, 18, 19, 20, and 22);
- Role of computer, internet and software for language learning;
  6 items represent this category (questions 9, 11, 13, 14, 15, 16);
- Preference of students: computer or textbook, pen and paper?
  8 items relate to this category (questions 4, 7, 8, 10, 12, 17, 21 and 24).

One question (23) is a general statement, not directly related to the English classroom, but to the relevance of ICT later in life. In the questionnaire, the students had to indicate, on a four-point scale, to what extent they agree with each of the 24 statements. The reason for choosing a four-point scale is that even scales lack a midpoint and, in that sense, force a choice. The four-point scale corresponds to (1) agree strongly, (2) agree somewhat, (3) disagree somewhat, and (4) disagree strongly.[9]

The survey was conducted at the *Veluws College Walterbosch* in Apeldoorn, and all students are in their first three years of havo and vwo. A total of 184 students completed the questionnaire, which can be found in Appendix C. Part of the survey is dedicated to the five classes of teacher Gijs, which were observed during their English lessons with ICT. The survey also included a comparison group of three classes of teacher Aisling, who does not use ICT in her English lessons. All classes differ in terms of age and level: one 1-havo class, one 2-vwo/gymnasium class, one 2-vwo class, two 2-havo classes, and three 3-havo classes.

As it concerned their personal opinion, they did not have to fill in their names. In consultation with the teachers, for practical and technological reasons, the decision was made to present the questionnaires on paper. The questionnaire can be found in Appendix C.

The table, on the next page, shows the various classes that took part in the students' survey.

[9] Scores are not related to positive or negative Likert-scales.

Participants student questionnaire

	Class	*Name*	*Teacher*	*ICT*	*Number of students*	*Total*
1	2 vwo	2A1	Gijs	+	21	
2	2 havo	2H2	Gijs	+	26	
3	3 havo	3H2	Gijs	+	23	
4	2 havo	2H1	Gijs	+	20	
5	3 havo	3H1	Gijs	+	17	n = 107
6	1 havo	1HA3	Aisling	-	27	
7	3 havo	3H5	Aisling	-	25	
8	2-vwo/gym.	2AG1	Aisling	-	25	n = 77
Total					184	n = 184

The first five classes in the table are the same classes where the observations took place. The survey also included a comparison group of three classes of another teacher, who does not use ICT in her English lessons. All classes differ in terms of age and level: one 1-havo class, one 2-vwo/gymnasium class, one 2-vwo class, two 2-havo classes, and three 3-havo classes, adding up to a total of 184 students. The various classes and categories give means to make comparisons between the different groups, classes and school years.

Before the students filled in the questionnaire a short instruction was given. After completion, the questionnaires were collected and bundled per class. The data were entered manually into a spreadsheet, using Excel 2010. Each questionnaire was entered under specific headings, such as class, teacher, and questions 1 to 24. For all questions, the mean values and standard deviations were calculated for (1) the whole group and (2) the two groups 'with and without ICT'. This way, not only the average scores can be determined, but also the spread of the scores. The mean tells us what the average score is on a particular statement. The standard deviation points to the spread of the scores, or to the extent in which the opinions are divided between the students.[10]

[10] Statistically, the standard deviation is the square root of the variance. The higher its value, the more the differences are spread out. Many studies mainly focus on the differences between average values, ignoring the variance and the differences in variance. As a result, the information in the data is not fully used and opportunities for interpretation are being missed. If the various sources of variance are excluded in an analysis, opportunities for substantive and nuanced interpretation of the results are lost (Van den Bergh, 2009). Therefore, in the student questionnaire both means and standard deviation are taken into account for the analysis.

The mean values and standard deviations were calculated for all 24 statements. Then the statements were selected that showed a difference in average (> 0,2) and a difference in standard deviation (> 1) between the classes with and without ICT. Subsequently, these statements were further investigated to identify the differences between the various groups: first on the level of the two groups with and without ICT, and subsequently on the level of the three different school years (year 1, 2, and 3). The results of the student survey are also presented in percentages to provide a clearer picture. Data of the survey can be found in Appendix D. The results of the student survey will be presented in Chapter 6.

First, in the next chapter, the results of the classroom observations will be described, preceded by the interview with the teacher and an overview of the tools.

5 Teaching with technology: interview and observations

In the following two sections (Chapters 5 and 6) the results of the research study will be presented. This chapter aims to answer the first three sub questions:

(1) What are the views of "Meester Gijs" on teaching English with technology?
(2) Which ICT-tools are used in his blended language learning classroom?
(3) How are the principles that are considered important in effective blended language learning implemented in the observed English lessons?

First, the results of the interview with English teacher Gijs Palsrok will be outlined to find out "why" and "how" blended language learning takes place in the English classroom. A key element in the lessons is the teacher's website *meestergijs.nl*, which will be introduced followed by a short description of the other ICT-tools that the teacher currently uses, and the tools that were used in the observed lessons. Finally, the results of the classroom observations will be described, first shown in an observation scheme and then commented on with reference to the main principles of effective blended language learning.

5.1 Views and tools Meester Gijs

As a paragon of 'teaching with technology', teacher Gijs focuses on different digital ways of learning and teaching. He is a strong advocate of social media and ICT applications inside and outside the classroom and likes changing the form and content of the "old" education system by means of blended learning, in particular flipping the classroom. The idea is that students watch online pre-recorded video lectures before class. What used to be homework is now done in class with the teacher, who is able to offer personal guidance, instead of lecturing.

The site *meestergijs.nl* is especially intended to support students outside the classroom, so that they can have an extra look at the subject matter or practice their skills at any time that suits them: "moving education beyond bell-to-bell". In the classroom, the site serves as a starting point and platform for the teacher's lessons. Before each class, Gijs makes sure that the learning materials, exercises and for instance quizzes are uploaded and "stand by".

His main aim as a teacher is to minimise plenary instruction in class, so that there is time available to help students individually. He states that there are students who are faster than average, and drop off because of that. There are also students who are a bit slower and give up

for other reasons, and subsequently start talking and disturb the lesson. He aims to maximise class participation and says he "would rather have ten fingers on a keyboard than one in the air." Gijs sums up three reasons for integrating technology in his English classes: (1) differentiation: learners are able to work at their own pace, (2) motivation: it is motivating for his students and it also gives him energy as he likes working with ICT, and (3) less talking: he wants to talk less in class and spend more time doing other things such as supporting his students face-to-face.

The most important tool for the teacher is the internet, his "best friend", because it brings the world into the classroom and subsequently draws the students into the lessons. This makes both the teaching and learning experience much more engaging and dynamic.[11] He also likes to use "timesaving" online tools like *TodaysMeet* to ask students questions in class. When students type their questions, they appear on the teacher's screen who in turn can respond swiftly: "this saves a lot of time, time I prefer to use sitting next to a student who needs my help, face-to-face." All in all, his blended approach centres around (1) instruction or "how-to" tasks online; (2) questions and answers between students and between teacher and students in a digital dialogue channel, and (3) digital diagnostic testing.

The tools that the teacher currently uses include:

- SimpleMeet.me for communication between students as a silent dialogue channel, and between teacher and student for fast feedback (http://www.simplemeet.me);
- Scrumblr for the visualisation of structure (http://scrumblr.ca);
- ThingLink to create interactive summaries (www.thinglink.com);
- Google Forms for diagnostic testing and compiling quizzes (http://www.google.com/google-d-s/createforms.html). These so-called MG or Meester Gijs quizzes are then uploaded in the teacher's website for class;
- Socrative for diagnostic testing and students responses (http://www.socrative.com); and Kahoot: a game-based, classroom response system (https://getkahoot.com);
- Kidblog, to enhance students' writing skills. This is a preformatted writing tool so students can create their own blog to be shared with other students within or outside their own group (http://kidblog.org).

[11] More information can be found on www.meestergijs.nl and www.gijspalsrok.nl.

Gijs stresses that other aspects of teaching are also important and that ICT should never be a goal in itself. One day a week he works as the ICT-coordinator in this school, but admits that his 'teaching with technology' takes a lot of his time, preparing for the lessons and maintaining his website, but because he likes it so much he does not see it as a problem. He likes to take the lead in school as far as ICT is concerned, but also signals an increasing gap between teachers "if they do not join in". And when technology is not taken on board "then we let the boat go, miss the train and will become a museum."

In his view, educational websites, applications and social media are changing the world of education, and integrating the right applications in the classroom is no longer a challenge, but a must. Education must prepare young people for the future, so teachers "have to push the boundaries of their gilded comfort". Sharing ideas is "extremely valuable" and may yield a network of teachers seeking to improve their teaching because "teaching with technology is indispensable in this rapidly changing digital age".

Another problem that he notices is that the higher classes, starting from the third year, stop bringing their laptops to school because they know that they are "not rewarded" when they bring it and it is not being used, and therefore, leave it at home. It is a vicious circle because "you know you cannot prepare tasks and exercise for which they need their laptop".

Although the teacher frequently uses blogs for promoting collaborative writing and to enhance students' writing skills, he mainly uses ICT for independent rather than collaborative work. Furthermore, he was not yet aware of the possibilities of telecollaboration projects via video-web communication, to improve students' communicative skills and create intercultural awareness. He likes the idea of online intercultural exchange and immediately stressed that this would "definitely be interesting".

5.2 ICT-tools in the lessons observed

In this paragraph, the ICT-tools that were used in the observed classrooms will be listed and each tool will be briefly introduced by describing the functionality and features of the tool, and how it can be used in the classroom.

Overview of the ICT tools in the observed English lessons.

Tool and Link	*Purpose*
Meestergijs.nl *www.meestergijs.nl*	Website developed by the teacher and published on the internet. For usage in and outside the classroom, by teacher and students. Communication between students and between students and teacher. Providing support for online reading, listening/watching, etc. and practising language skills, grammar and vocabulary. Other schools, teachers and students use his site too.
ClassDojo *http://www.classdojo.com/nl-NL*	Classroom management tool to improve behaviour in the classroom. In a digital portfolio, teacher keeps track of actions and tasks performed by students and their scores on "perseverance, orderliness, working together, helping others, proper engagement, good starts and good jobs."
Classtools *www.classtools.net*	"Fruit machine": online name and word picker. Generates names or words on a random base. With sound and applause. To spice up the classroom by introducing a game element into the lessons.
TodaysMeet *https://todaysmeet.com*	Aims to give everyone a voice and supports communication between students and teacher for fast feedback, or among students as a silent dialogue channel. Used for asking questions or making comments. Students post their question regarding the subject matter simultaneously, which appears on the teacher's screen or smartboard. Students do not have to raise their hand if they do not understand something. Questions are then discussed in class. This way, teacher can communicate with students in real-time and provide fast feedback.
Stepping Stone Online *http://steppingstones.online.noordhoff.nl*	Exercises are directly linked to the course book, and identical to the paper version. The added value of digital version is the direct feedback, a learning aid and explanations on demand.
Google Forms	The teacher compiles his own diagnostic tests and exercises in Google Forms, such as Meester Gijs (MG) quizzes. Students make them in class and the teacher can see the results instantly on his screen and discuss them straight away in class. This way he can "see who needs help and monitor learner's developments."

5.3 Classroom observations

This section investigates the relation between the classroom observations and the theoretical and research-based principles of effective blended language learning. First, the filled-in observation schemes are displayed for each lesson, and then discussed on the basis of the criteria mentioned in Appendix B.

Class 1: 2-vwo - computer room

The first lesson was given to a 2-vwo class in the computer room, with 21 students present. Parts A and B of the filled-in observation scheme are displayed in tables 5.1 and 5.2 respectively.

Table 5.1: Part A of observation scheme for lesson 1 in the computer room (2 vwo - 21 students)

Time	*Teacher*	*Students*	*Work Form*
5	Tells students to "grab notebook, check homework". Explains grammar (lot-much-many) and instructs everybody to work in their own tempo.	Listen	Teacher Talking Time/ Plenary instruction
10	Picks 5 students for vocab test with online name picker: "fruit machine."	5 students do vocab test with pen ad paper, the rest practises extra exercises online (Stepping Stone).	Whole-class activity Individual
30	Divides whole group in two. Explains (in Dutch) that the groups have to study the instruction video or presentation online, practice on meestergijs.nl and make MG-quiz. Tells to share difficult questions on TodaysMeet. Is available for assistance upon students' request. Helps students where needed: explains and answers questions.	Chatting; start up computer. Some need more than 5 minutes. Working with computer and textbook. One student is doing other things and is taken aside. He has to practice grammar on meestergijs.nl.	Individual Group 1 practices 'articles' online Group 2 practices 'much/many' online
5	Reads out the 5 grades vocabulary test: between 8 and 9.	Applaud	Whole class

Table 5.2: Part B of observation scheme for lesson 1 in the computer room (2 vwo - 21 students)

Points of interest	*Notes*
Technology/ICT	Combination of learning online and textbook in computer room. Main focus on grammar and exercises. Starting up computers takes time, otherwise no technical problems.
Individual differences	Aim is to let students work independently and in their own tempo. Class is divided in two groups; each group has a different grammar topic, but the same instructions: study video, practice, complete MG-quiz, share difficult questions on TodaysMeet.
Student independence	Students work individually and independently. They seem to like lessons in the computer room and therefore enjoy doing the exercises.
Student interaction	There is some interaction between the students: some are chatting and/or discussing answers with each other, or ask the teacher for help. In Dutch, not as part of a task.
Teacher guidance	The teacher walks around to help students who have more difficulties than others while doing the exercises, gives students feedback and answers questions individually, and later plenary via TodaysMeet in class. As the exercises are all focused on form, so is the teacher's feedback. Students have to complete the MG quiz and feedback on the final score is provided.

Like all the classes observed, the first lesson will be discussed on the basis of the criteria mentioned in Appendix B. The main aim of the lesson was to enhance the student's grammar skills for the upcoming test week. The whole lesson is therefore focused on form. For the diagnostic testing of their grammar knowledge, the teacher had created a 'Meester Gijs' quiz. In addition, the link to the online grammar exercises (Stepping Stone online) was provided on the

teacher's site, which serves as the foundation of all his English lessons. The topic of the task[12] was not meaningful to the students, in the sense that there was no real topic. All exercises consisted of separate sentences, which students had to complete or correct. The task was relevant, however, by training their grammar skills for the test week.

The plenary instruction is short, as Gijs has students watch his pre-recorded video online. By dividing the class in two groups of different levels, he takes into account the individual differences between students. The teacher uses tools, such as ClassDojo, that report learner progress. This provides him with a good overview of who is falling behind or needs help. The whole class is able to work independently, with the exception of one student. Students can choose to do the exercises in their textbook or in the online version of the teaching method, so they do not have to use the online tool and can work with pen and paper as well.

The lesson starts with a vocabulary test. Each lesson, five students are picked with the 'fruit machine'. The whole class makes the test, with pen and paper, only these five are graded. The fruit machine is hilarious because of the 'real' sound and the applause that follows after the students are selected. This way it is not a punishment to be selected for the test. The remaining class time is mainly spent on making exercises. The teacher is on hand to answer questions as they arise. Students can make the Meester Gijs quiz online when they think they are ready for it. The right answers pop up immediately, but this needs to be changed as the teacher wants students "to think about the right answers".

Finally, the teacher asks the students to post difficult questions about the subject matter on TodaysMeet.com. This way, students can ask questions without having to wait with their hand in the air. This tool also offers the opportunity to provide support without drawing attention to it in class, in particular for shy students who are not keen to ask questions in public, so students feel free to ask what they want. The questions appear on the teacher's screen, so he can answer them plenary.

All in all, the atmosphere in the computer room was pleasant. The lesson was coherent; the technology seemed appropriately selected for the learning objectives; and a supportive environment was provided.

[12] The word 'task' is used to define a series of exercises that form a coherent whole.

Class 2: 2-havo - classroom

The second lesson was given to a 2-havo class in the classroom, with 26 students present. Parts A and B of the filled-in observation scheme are displayed in tables 5.3 and 5.4 respectively.

Table 5.3: Part A of observation scheme for lesson 2 in classroom (2 havo - 26 students)

Time	*Teacher*	*Students*	*Work Form*
5	Welcomes class with picture "beautiful Friday" on smart board and explains programme of the lesson in half Dutch, half English.	6 students start up laptop and go to meestergijs.nl and todaysmeet.com 5 students enter later 15 students open their textbook	Teacher Talking Time/ Plenary instruction
5	Picks 5 students for vocab test with online name picker: "fruit machine."	5 students do vocabulary test, rest checks homework	Whole-class activity Individually
5	MG-quiz is next. However, quiz does not load properly. Tells to make an exercise (articles) in textbook instead.	Make an exercise in the textbook because quiz does not load. Half of students on laptop/tablet, other half use textbook	Whole-class activity Individual
20	Checks student's not-working tablet. Says that if the site does not work, students have to work in their textbook. Walks around, helps students where needed: explains and answers questions.	Work in textbook or laptop/tablet	Individual
5	Tells student to put questions on TodaysMeet; "also possible with your mobile."	Post their question with laptop or smart phone	Individual
5	Opens TodaysMeet and discusses questions in Dutch		Whole-class activity
5	Shows "latest" Michael Jackson music video "Love Never Felt So Good" feat. Justin Timberlake on YouTube.	Listen to the music and watch the clip	Whole-class activity

Table 5.4: Part B of observation scheme for lesson 2 in the classroom (2 havo - 26 students)

Points of interest	*Notes*
Technology/ICT	Plenary instruction with presentation on smart board. Combination of learning online and textbook. Internet used for diagnostic testing (MG quiz). The quiz does not load properly because the Wi-Fi is slow. Textbook takes over.
Individual differences	Aim is to let students work individually with the medium of their choice. As noted above, the choice is later limited to the textbook.
Student independence	Students check their homework themselves with pen and paper, and make exercises in textbook individually.
Student interaction	There is some interaction between the students in Dutch, consulting each other seemingly, but not as part of the task. Technical problems cause some noise.
Teacher guidance	The teacher walks around and gives students feedback, answers questions, and checks a student's tablet that is not working.

Although the aim and content of the second lesson is very similar to the first one, including the selection of the candidates for the vocab test and the exercises, this lesson takes place in the

classroom. This immediately illustrates the challenges that ICT poses in an ordinary classroom, and that teaching and learning with technology is as strong as the weakest link. Firstly, only half of the class brought their laptop. This means that not everybody can do the quiz online, so paper versions need to be supplied as well. When it is time for the online MG quiz, it does not load properly. Instead the class makes an exercise in the textbook. One tablet does not seem to work, so the teacher checks the tablet. In the meantime the student is not able to work on the tablet himself. All in all, this made the lesson rather messy and less effective.

However, posting questions in TodaysMeet worked well and some students used their phone to post their questions. The teacher also used ClassDojo to register good behaviour and good questions of some students. As a result, the teacher found out that two of his most quiet students, who mostly stay unnoticed, have the highest scores (100%) in this class management tool. This tool makes these students visible in a positive and well-deserved way. They are rewarded 'bonus points' by the teacher.

Although this lesson exemplified the technical and practical implications when teaching and learning with technology, the pedagogical tools such as TodaysMeet and ClassDojo are very useful in handling students' questions and making their performance visible.

Class 3: 3-havo - classroom

The third lesson took also place in the classroom. Twenty-three students of the 3-havo class were present during the lesson. Parts A and B of the filled-in observation scheme are shown below.

Table 5.5: Part A of observation scheme for lesson 3 in the classroom (3 havo - 23 students)

Time	*Teacher*	*Students*	*Work Form*
5	Welcomes class and explains programme of today's lesson	Use work- and textbook as none of them brought their laptop.	Teacher Talking Time/ Plenary instruction
10	Picks 5 students for vocab test with online "fruit machine" name picker. These students are graded for the test.	Make vocabulary test. Only five will be graded. Rest checks their own test using pen and paper.	Whole-class activity Individual
10	Tells class to fill in exercise in workbook: "Choices that made America"	Make exercise in workbook and discuss topic in pairs	In pairs/ Individual
20	Searches through folders in his laptop and finds audio file "Going Abroad".	Listen to audio file of two British students who have been travelling abroad. After listening fill in the matching grid in textbook.	Whole-class activity Individually
5	Tells class that they should listen to meestergijs.nl, if they find listening to English speaking people difficult.	Listening task and matching exercise are discussed in class (in Dutch).	Whole-class activity

Table 5.6: Part B of observation scheme for lesson 3 in the classroom (3 havo - 23 students)

Points of interest	*Notes*
Technology/ICT	Plenary instruction with presentation on smart board. No laptops present, only the teacher's. Audio file is played from this laptop.
Individual differences	Some students find it difficult to understand the British speakers of the audio file.
Student independence	Students make textbook exercise individually and discuss in pairs about 'America' quite independently.
Student interaction	There is some interaction between the students in English as students discuss exercise and topic "Choices that made America" in pairs.
Teacher guidance	The teacher walks around and answers questions during the exercise and encourages students to practise their listening skills on his site.

The third lesson is different from the preceding two. None of the students brought their laptop, so no laptops are used. In the interview, the teacher already mentioned this by saying that students tend to stop bringing their laptops to school once they are in their third year. This means that the teacher must adopt a more traditional approach.

There is consensus about the importance of input for developing the highly connected implicit knowledge that is needed to become an effective communicator in the second language. If the students receive a large amount of comprehensible English input, they will also have an easier time in producing and improving their output. The audio tape was authentic and for most students comprehensible, though clearly focused on the native British speaker. However, the recording and exercise were subsequently discussed in Dutch as a whole class activity, and without any interaction in the target language. It seems that the exercise 'fill in the grid' in the textbook dictated the listening task. In this respect the task focused primarily on form, and not on meaning. Students were not required to use language as a tool for communication and were not encouraged to express their ideas about the topic of 'going abroad' of the audio recording. There was, however, some interaction between the students in English as they discussed an exercise and topic "Choices that made America" in pairs, but not for more than five minutes.

Class 4: 2-havo - classroom

The fourth lesson is given to a 2-havo class in the classroom. Twenty students were present. Parts A and B of the filled-in observation scheme are displayed in tables 5.7 and 5.8.

Table 5.7: Part A of observation scheme for lesson 4 in the classroom (2 havo - 20 students)

Time	*Teacher*	*Students*	*Work Form*
10	Explains how he got his grey hair and that this class has something to do with that. The tone is more stringent. Warns that students who *still* have not finished their homework have to leave the classroom.	Show their homework. One student is expelled for not making his homework. All textbooks are on the table.	Teacher Talking Time/ Plenary instruction
15	Picks 5 students for vocab test with online "fruit machine" name picker. These students are graded for the test.	Make vocabulary test. Only five will be graded. Rest checks their own test using pen and paper.	Whole-class activity Individual
10	Introduces listening task, mostly in Dutch. Explains that students have to make notes while listening. Announces discussion after listening.	Listen to Tell Sell sales techniques for the "Body-brain enhancer", which is linked to the textbook. Fill in the grid in their textbook after listening.	Whole-class activity Individual
10	Repeats the main points of audio tape. Leads discussion about other sales techniques.	Discuss the topic, mostly in Dutch.	Whole-class activity
5	Discusses exercise	Make multiple choice exercise about spending money.	Whole-class activity Individual

Table 5.8: Part B of observation scheme for lesson 4 in the classroom (2 havo – 20 students)

Points of interest	*Notes*
Technology/ICT	No laptops present, only the teacher's. Audio file is played from this laptop.
Individual differences	A demanding class. Not everyone has made the effort to finish their homework they were supposed to. Even for the lesson prior to this one. Most of them did however.
Student independence	Students need to be strongly guided, so apparently, the level of student independence is not high enough.
Student interaction	In the form of a class discussion in Dutch, after listening to the audiotape about sales techniques.
Teacher guidance	The teacher has a different role in this lesson and is clearly more stringent. He needs to check everyone's homework and one student is expelled. Teacher leads the discussion in class and directs the learning process.

In this fourth lesson, students required a lot of classroom management and correction, so the teacher spent quite some time checking if everyone had done their homework. Just like the previous 3-havo class, no one brought a laptop. So here, too, the teacher has no other choice than a more traditional teaching approach.

After the vocabulary test, similar to the previous four lessons, the teacher introduces a listening task concerning sales techniques. While listening, students have to make notes by hand. The teacher may not have been aware of the advantages of writing by hand, but as a new study

shows, pen and paper appear to help students understand the subject matter better, and store it in their memory more quickly. In other words, the pen is mightier than the keyboard in this respect (Mueller and Oppenheimer, 2014).

After the listening task, students have to fill in a grid, an accompanying exercise, in their textbook using their notes. The teacher then repeats the main points of the audio tape, which is also an effective way for embedding knowledge. A discussion follows, mostly in Dutch. With an exercise about spending money, the components of this lesson make a coherent whole.

Although it may have been not the easiest lesson for the teacher, it contained some strong points that made up for the time lost on the necessary class management. The teacher focused on the facilitation and direction of the learning process. The students understood their roles and responsibilities, and their note-taking and the teacher's recap made the listening task more effective. The instructions were clear and the various components aligned. The lesson was coherent and, in that respect, successful.

Class 5: 3-havo - computer room

The final lesson is given to a 3-havo class in the computer room. Seventeen students were present during the lesson. Parts A and B of the filled-in observation scheme are displayed in tables 5.9 and 5.10 respectively.

Table 5.9: Part A of observation scheme for lesson 5 in the computer room (3 havo - 17 students)

Time	*Teacher*	*Students*	*Work Form*
5	Explains task for today: preparing a 20-slides presentation about the USA, which eventually has to be posted on *its-learning*. Explains that students are free to choose information sources but reminds the students not only to use Wikipedia but also use Google or Facebook.	Listen and start up computers.	Teacher Talking Time/ Plenary instruction
10	Picks 5 students for vocab test with online "fruit machine" name picker. These students are graded for the test.	Make vocabulary test, of which five will be graded. Rest checks their own test using pen and paper.	Whole-class activity Individual
35	Walks around and gives instructions if needed.	Work on their PowerPoints. Screens are filled with McDonalds, Subway, and most of all sneakers and trainers. Discuss in pairs and with classmates.	In pairs

Table 5.10: Part B of observation scheme for lesson 5 in computer room (3 havo – 17 students)

Points of interest	*Notes*
Technology/ICT	Computers and internet to prepare slides for a PowerPoint presentation. No technical problems.
Individual differences	Not visible in this lesson. Everybody works in pairs on their presentations and with their computer.
Student independence	Students work independently and in pairs.
Student interaction	In Dutch, students discuss in small groups, and sometimes consult the teacher or classmates. The mood is lively and bubbly.
Teacher guidance	The teacher walks around and offers support and guidance when needed. Every now and then he repeats the aim of the presentation task for the whole group and how they should conduct their research on the internet.

During the fifth and final class, 3-havo students have to prepare for an upcoming presentation. The teacher explains the assignment in Dutch: in pairs, they have to make 20 slides about the USA. They are free to choose how they fill in these slides. The capacity to collaborate is an important outcome for all learners and, as Swain (2000) argues, teamwork is imperative when it comes to an effective task. In addition, preparing for the upcoming presentations can be regarded as a pre-task, and the provision of pre-task activities helps students to understand the goal of the task and identify ways of interacting that will facilitate task performance while generating learning opportunities (Ki & McDonough, 2011).

During the task the teacher walks around the computer room, provides instructions and assists when necessary. The teacher's minor role gave the students the opportunity to make their own decisions and to work independently from the teacher. The entire task consists of exchanging information with peers, in Dutch, which means less teacher talking time and more active student participation. Noticeably, this class did not require as much classroom management and correction as the previous one.

To sum up, this final lesson was pleasant for both teacher and students. The class time was spent in a positive and engaged way. There was sufficient challenge for students regarding the assignment, the topic was relevant, there were no technical problems, and students had an active role in a supportive environment with sufficient opportunities, in Dutch, for feedback and communication.

5.4 Analysis classroom observations

This paragraph will try to answer the question: to what extent were the five principles of blended language learning applied in the observed English lessons? In order to do this, the results from the previous paragraph will be related to the criteria derived from the theoretical background of effective second language education and blended learning. First and foremost, the principles of effective language teaching and learning remain paramount. Secondly, ICT should be selectively used and as means to an end. Thirdly, blended learning aims to create a learning environment that works as a whole, so the various components should be aligned. Fourthly, effective levels of cognitive, social and teaching aspects should be present in the online part in the blend. Finally, a blended learning environment requires a supportive environment, both online and in the classroom, with opportunities for feedback and communication.

(1) Focus on the principles of effective teaching and learning.

The most appropriate starting point for blended language learning is the application of principles derived from the theoretical background of second language learning, as discussed in Chapter 2. The following elements are essential for effective language education: (1) a rich learning context, in which learners receive a large amount of comprehensible and varied input in English; (2) with sufficient opportunities to produce English themselves; (3) a focus on both meaning and form; (4) the use of authentic and meaningful tasks to promote interaction and negotiation of meaning; (5) encouragement to using strategies; (6) the provision of appropriate feedback to students' English language production; and (7) a focus on an intercultural context.

Although it should be acknowledged that five lessons are not necessarily representative for all the other lessons in the curriculum, most of the principles mentioned above were missing in the lessons observed. In general, most of the time the teacher spoke Dutch, or half Dutch half English. The students, too, spoke Dutch most of the time during the lessons. One lesson contained a short speaking activity in English, but no more than five minutes. With respect to the first two principles – input and output - none of the lessons contained a rich learning context, in which students received a large amount of comprehensible and varied input in English. Nor were they provided with sufficient opportunities to produce English themselves.

The first two lessons focused entirely on form. The exercises, both online and in the textbook, asked students to manipulate language given to them rather than to promote interaction and

negotiation of meaning. The exercises were not meaningful as such and lacked a ‘real’ topic, but were relevant with respect to training their grammar skills. Students worked independently and individually, and were not encouraged to negotiate meaning. There was no language production in the target language, and the teacher’s feedback focused on grammar issues.

Key issues within second language education are authentic and meaningful tasks that promote interaction and negotiation of meaning. The third and fourth lesson contained authentic listening tasks, but these were mainly discussed as a whole class activity, in Dutch, so again without any interaction in the target language. This way, students were not required to use the English language as a tool for communication and not encouraged to express their ideas about the topic in English. In addition, no technology was used that could have added to the authenticity and intercultural level of the lessons.

During the fifth lesson in the computer room, students worked in pairs to prepare for an upcoming presentation about the USA. The capacity to collaborate is an important outcome for all learners, so this is a strong point of this lesson. In addition, preparing for the upcoming presentations can be regarded as a pre-task, which helps students to understand the goal of the task and identify ways of interacting that will facilitate task performance while generating learning opportunities (Ki & McDonough, 2011). However, the assignment was explained in Dutch and students were exchanging information in Dutch.

In short, most of the criteria for successful second language learning that should remain paramount in a blended learning environment were not met. Although there are many blended learning opportunities for language learners, technology was not primarily used as a means to enrich second language learning and enhance meaningful tasks in the lessons observed.

Whether online, face-to-face, or in a blended form, the foundational building blocks of *any* learning environment should include: clear instructions, objectives and explanations; tasks with sufficient challenge for students; time-on-task (depending on good classroom management and highly interactive teaching styles); timely feedback; and positive relationships between teacher and students. To start with the latter, the relationship between teacher and students was positive throughout, the atmosphere in the classes overall very pleasant. Most students had no problem working independently with the teacher on hand to help and answer questions. In all of the

lessons the instruction, tasks and objectives were clear to the students and there seemed to be sufficient challenge, as they were able to work on different levels, in particular in the first lesson.

Students achieve higher when they have more engaged time or time-on-task (Slavin, 2003). The fourth class required quite some classroom management, which was a waste of time, but for the other classes the amount of time actually spent learning seemed sufficient. Feedback, whether in a face-to-face or blended context, needs to be timely and relevant to the learner's needs. When feedback is provided too soon it may stop students reflecting on their work; if it is provided too late it may no longer be relevant (Angelo, 2013). The teacher's face-to-face feedback was well-timed and relevant. However, during the digital test quiz the right answers popped up straight away, thus too soon, which made it impossible for students to reflect on their answers.

(2) Selective use of technology

Blended language learning strongly depends on technical resources, and whenever technology is involved things can go wrong. The learning process is inhibited and becomes counterproductive when it does not function properly. Therefore, technology should be selectively adopted into the blended learning environment. ICT-tools need to be reliable, easy to use, and up-to-date in order to increase the overall effectiveness of teaching and learning.

During the first lesson– a combination of learning online and textbook in computer room – there were no technical problems. Only starting up the computers took some time. The main aim of this lesson was to enhance the student's grammar skills for the upcoming test week. Students watched the teacher's pre-recorded video online, and were able to work independently. They could choose to either do the exercises in their textbook or online. All exercises – on paper or online - consisted of separate sentences, which students had to complete or correct. For the diagnostic testing of their grammar knowledge, the teacher had created a quiz which worked properly. The only problem was that the right answers popped up immediately, so students could not reflect on their answers. They seemed to like to work in the computer room and therefore enjoyed doing the exercises.

Though the aim and content of the second lesson was very similar to the first one, this lesson took place in the classroom. This immediately illustrated the challenges that technology poses in an ordinary classroom. Firstly, only half of the class brought their laptop, so not everybody could do the online quiz and paper versions were needed as well. Then, the online quiz did not load

properly, so the class made an exercise in the textbook instead. The teacher needed to check a tablet that did not seem to work, which took some time. All in all, this lesson was rather messy and exemplified that teaching and learning with technology is as strong as the weakest link.

In the third and fourth lesson no laptops were used, mainly because students did not bring them, so the teacher adopted a more traditional approach. Both lessons contained plenary instruction with a presentation on the smart board. There was hardly any technology involved, so there were no technical problems.

Like the first lesson, the last lesson took place in the computer room. Students used computers and internet to prepare for an upcoming PowerPoint presentation. There were no technical problems and class time was spent in a positive and engaged way.

In sum, selecting the most suited technology and tools is crucial for blended language learning. ICT tools must be (1) reliable, easy to use and up to date; (2) an added value for learning goals; (3) varied and blend 'the best of both worlds'. Although the ICT-tools that were used in the classes seemed to be carefully selected, they did not work properly in some of the lessons. Moreover, the teacher's 'own' tools - the online 'fruit machine', TodaysMeet and ClassDojo were useful in the teaching process, but not necessarily for language learning. To a certain extend they were an added value for learning goals, for instance to prepare for the presentations. Finally, the tools were not primarily selected to blend 'the best of both worlds', but both technology and older media had a place in the blended learning classroom and students could choose between textbook or computer.

(3) Alignment of components to achieve a coherent and effective blend.

Online technologies have enormous potential, but an effective blend requires maximal alignment of the various components to create a learning environment that works as a whole. In other words, the different components of the blend should complement each other. Establishing complementarity starts with identifying the learning outcomes, the students' needs, and how these learning outcomes and needs can be supported by the various components, such as: clear and meaningful objectives, content, model of instruction, learner tasks, teacher roles, and appropriate technology to complement and support the learning process.

Overall, the learning objectives were clear. The main aim of the first two lessons was to enhance students' grammar skills, the third and fourth lesson focused on a listening task, and the fifth lesson aimed at preparing a presentation. Students received clear instructions and understood their tasks. The various components appeared to be sufficiently aligned and the lessons were quite coherent, including (more or less) meaningful learning objectives, a learner-centred approach, and a fairly active role for students (within the limitations of the assignments). In general, the teacher selected appropriate technology to complement and support the learning process. Moreover, he guided the students, managed their activities and directed their learning. In essence, the various components of the lessons - both blended and more traditional – appeared to be sufficiently aligned.

(4) Maintenance of teaching presence, social presence and cognitive presence

In online learning environments, three elements of "presence" - teaching presence, social presence and cognitive presence - are crucial for "meaningful and educationally worthwhile learning outcomes" (Anderson et al., 2001, p. 5). These three forms of "presence" must be attended to within the online learning environment, and coalesce to create a meaningful learning experience. Home to the online learning environment for the observed classrooms is, first and foremost, the teacher's own website meestergijs.nl. As a teacher he is literally present online and provides "the design, facilitation, and direction of cognitive and social processes" (Anderson et al., 2001, p. 5). The website is very extensive and serves as a base for his lessons and a joint platform for his students. It also provides extra support for students outside the classroom; they can have an extra look at the subject matter or practice various language skills at any time that suits them. This site serves to bring students online and classroom learning together.

Cognitive presence relates to the design and development of instructional materials, enabling students to move through the learning process. First of all, the teacher must seek to ensure that the online instruction videos and exercises are clear for all learners. For instance, there are a great many easy to find grammar instruction videos, mainly in Dutch. These are clearly linked with exercises from the internet. Furthermore, the site serves as a tool for online communication and contains tools for collaboration. As mentioned previously, the capacity to collaborate is important for all students. Small group collaboration heightens cognitive presence, and as an online learning environment, the site offers online support and possibilities for blended collaborative learning. In principle, the cognitive aspect is present within the online learning environment.

From the *social presence* perspective, it is important that the teacher is in rapport with the students and establishes a clear and open way to communicate online. This can be achieved by using social media tools, such as Twitter and Instagram, to keep student aware of the teacher's engagement and nurturing a sense of cohesion among the students. Social media tools are part of the teacher's site and also provide opportunities for online discussions, which are especially important within the context of completing tasks in collaboration with other students. Both Twitter and Instagram are part of the teacher's website and his tools to communicate and keep in touch with his students.

In sum, to enhance effective learning, it is essential to establish and maintain the cognitive, social and teaching presence within the online or blended part of the learning environment. In this case, the learning environment is the website Meestergijs.nl and can be seen as an example of an online environment that incorporates all of these three 'presences'.

(5) Supportive environment with opportunities for feedback and communication

An online or blended learning environment requires a supportive environment, with opportunities for feedback and communication. As the blended learning method also aims to foster independent learning, a supportive online community should provide the encouragement needed when students face their computer screen at home or in the classroom.

Here too, the teacher's website offers a friendly, social online environment, plus tools that promote the communicative use of technology. In addition, students can watch grammar videos over and over again and practice their language skills in their own time and pace. The teacher also uses the site as a base for his lessons. It helps to minimise plenary instruction, which saves time to support students individually. This aspect was clearly visible during the blended lessons.

In conclusion, most of the principles for successful second language learning were missing in the observed lessons. However, the blended learning environment contained many strong points. Technical problems only occurred in the classroom. ICT was used and as a means to an end, though not necessarily for authentic and meaningful tasks. The various components appeared to be sufficiently aligned. The online part in the blend, rooted in the teacher's website, contains effective levels of cognitive, social and teaching presence. Finally, a supportive environment is provided by the teacher, both online and in the classroom, with sufficient opportunities for feedback and communication.

6 Student survey

The views, beliefs and attitudes of students are part of any learner-centred approach and must be taken into account. Ignoring them will lead to resistance and thus encourage reluctance and ineffectiveness (Stracke, 2007). Therefore, it is important to know what students think about the use of ICT in education. This chapter presents the results of the student survey and describes their visions on the use of ICT and digital learning in the classroom and beyond. An important note: all respondents have their own laptops for use in school and at home. Therefore, the main focus is on using computers and/or laptops.

What do students think of the use of computers and their laptops in school and at home, how do they use technology for learning English, and how do they experience working with digital tools? In order to answer these questions, the questionnaire focused on the following categories:

- Working with computers and internet in class and at home;
- Using computer, internet and special software for language learning;
- Students' preference in the English classroom: technology or textbook?

In the next paragraphs the results of the questionnaire will be presented. For both the group 'with ICT' and the comparison group 'without ICT' the views of the students will be described with regard to their use of ICT at home, in school and in language education. Paragraph 6.1 displays students' general views on working with computers; paragraph 6.2 describes their use of ICT in language learning; and paragraph 6.3 probes their preferences on computer versus textbook. The data of the student survey can be found in Appendix D.

6.1 Working with computers

Technology is becoming increasingly important in both our personal and professional lives. Moreover, the current generation of students has grown up with ICT and computer literacy is an important skill in today's digital day and age. To what extent can today's students imagine life without computers and technology? Do they like working with computers? This paragraph displays students' more general views on working with ICT, computers and internet. The results are presented in percentages, means and standard deviations for the total whole group (n = 184), consisting of the group "with ICT" (n = 107) and the group "without ICT" (n = 77).

Figure 6.1 shows the response of the students, in percentages, to a more general statement: "Later in your life you can do without computers or internet" (question 23).

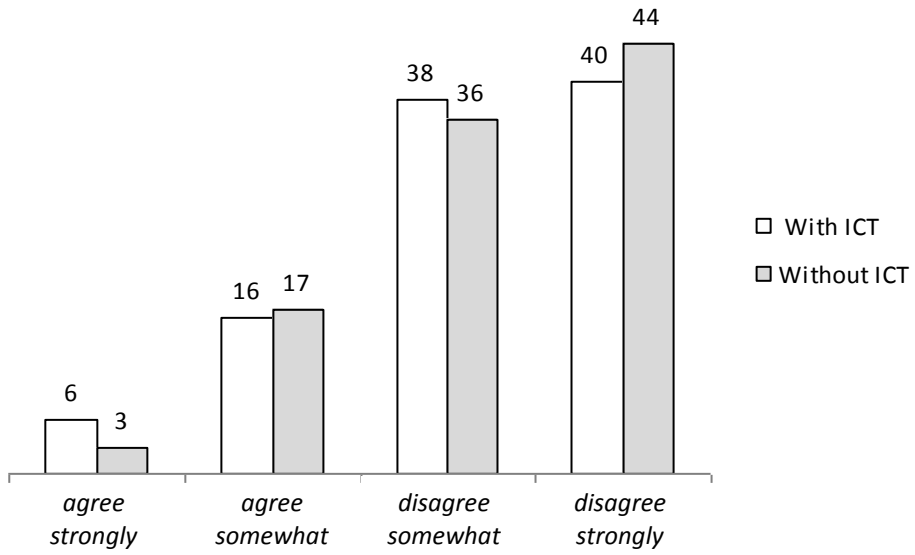


Figure 6.1 Students' response to "later in your life you can do without computers or internet" (in %)

The figure shows that, on average, students acknowledge the importance of computers and internet in their future life. In total, eighty percent underlines this statement, from somewhat to strongly, while twenty percent finds technology, computers and internet less important for their future.

Is it true that all students like to work with computers, and are they all equally skilled and interested? Table 6.1 shows to what extent students find it enjoyable to work with computers (question 5: *Ik vind het werken met computers prettig*).

Table 6.1 Working with computers (in %)

	Enjoyable	*Fairly enjoyable*	*Fairly unpleasant*	*Unpleasant*	Mean[13]	SD
Classes with ICT	44	42	9	5	1,75	0,66
Classes without ICT	51	34	14	0	1,63	0,52
Total	47	39	11	3	1,70	0,60

The table shows that, more often than not, students seem to enjoy working with computers. On the whole, a vast majority (86 percent) finds it pleasant, or fairly pleasant.

Figure 6.2 shows the response of the students to the statement: "I find it difficult to work with computers" (question 6).

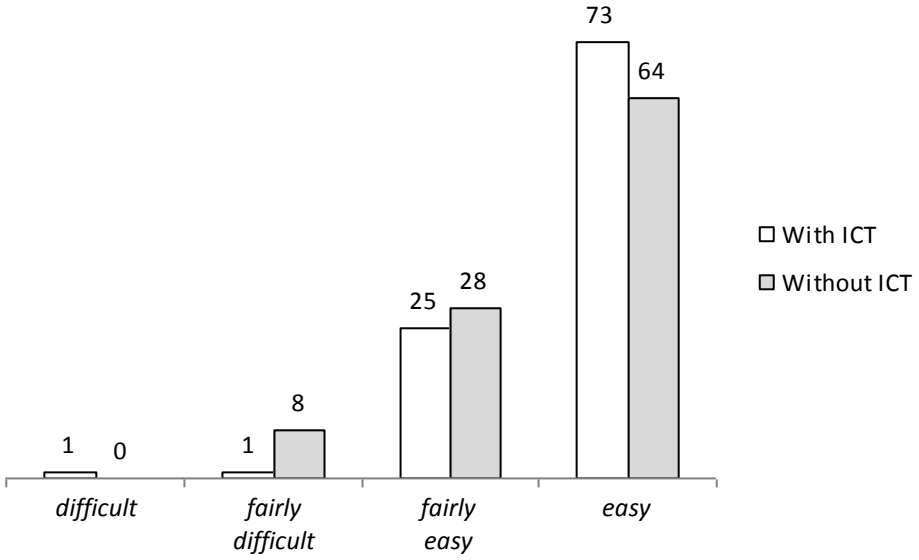


Figure 6.2 Students' response to the statement: "I find it difficult to work with computers" in %

These findings show that, overall, nearly 70 percent of the students find it easy to work with computers. The classes that work with ICT find it slightly easier than the classes without ICT. Almost everybody, 96 percent, finds it easy or fairly easy to work with computers. Only a small number finds it rather difficult. Saliently, no one from the classes that do not use ICT in the English classroom has marked working with computers as unpleasant (table 6.1), nor as difficult (figure 6.2).

Although many students seem to enjoy using computers, this does not necessarily mean that they see working with computers as a hobby (question 18: *De computer zal niet gauw een hobby van mij worden*). For both the ICT-group and the comparison group, more than one-third indicates that for them a computer is not a pastime. However, the vast majority can handle the computer reasonably well. Only a few students find it more difficult to work with computers (question 19:

[13] In most research studies high scores are related to positive aspects, for instance: "4" would be "enjoyable" and "1" "unpleasant". Here the results are presented differently, corresponding to (1) agree strongly, (2) agree somewhat, (3) disagree somewhat, and (4) disagree strongly.

Werken met de computer krijg ik maar niet onder de knie). The same applies to creating PowerPoint presentations or working with Word: 95 percent can do that rather well (question 22: *Powerpoints maken of werken met Word is gemakkelijk*).

Undoubtedly, internet provides easy access to a vast array of information, which is a powerful inducement for students to use it whenever they need to look up things. Table 6.2 shows that a vast majority of the students use the internet to obtain information, and around 90 percent use the internet if they need to look up things for learning purposes (question 1: *Als ik iets niet begrijp zoek ik het op internet*). Only five students indicate that they never use the internet to find information and apparently use other resources. For the vast majority, however, internet is a very important resource to look for information.

Table 6.2 Internet use to look for information (in %)

	Strongly agree (1)	*Somewhat agree (2)*	*Somewhat disagree (3)*	*Strongly disagree (4)*	Mean	SD
Classes with ICT	43	50	7	1	1,65	0,41
Classes without	47	42	5	5	1,68	0,64
Total	45	46	6	3	1,67	0,51

The chart below shows, once more, that students' internet use is fairly high. Only a few students indicate that they rarely or never use the internet if they want to look up something.

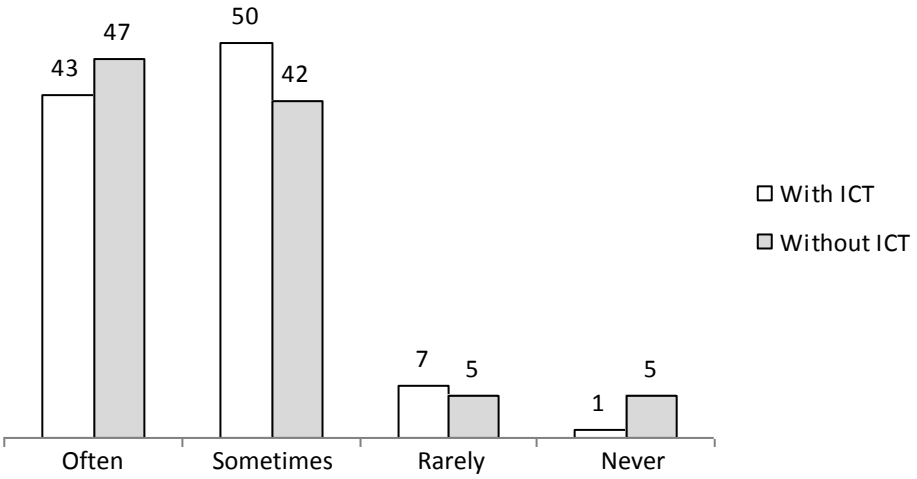


Figure 6.3 Percentage of students' use of internet

Today, students can use iPods, iPads, smartphones, laptops, and so forth to help them with their homework. They all know that if you do not know a word, you can google it, and if you want to

learn vocabulary, there are many online tools available, such as *Wrts*. Therefore, it is interesting to see to what extent students actually use their laptops for doing homework. Table 6.3 shows how often digital means are used to help students do their homework (question 3: *Thuis werk ik veel op de computer voor mijn huiswerk*).

Table 6.3 Computer use for homework

	Often	*Sometimes*	*Rarely*	*Never*	Mean	SD
Classes with ICT	28	36	27	8	2,16	0,86
Classes without	21	41	30	8	2,25	0,77
Total	25	38	28	8	2,20	0,82

The table shows that approximately two-thirds of the survey population uses ICT on a regular base, and that only a small number never does. Overall, twenty-five percent claims they use the computer often for their homework, whereby the ICT-classes slightly protrude above the other group.

To the statement: "In a class with computers, I am glad that the lesson is over" around 10 percent agrees strongly or somewhat (question 20). The other 90 percent indicates that they have no objection to a class in the computer room; on the whole they seem to like it quite a lot. This is shown in figure 6.4.

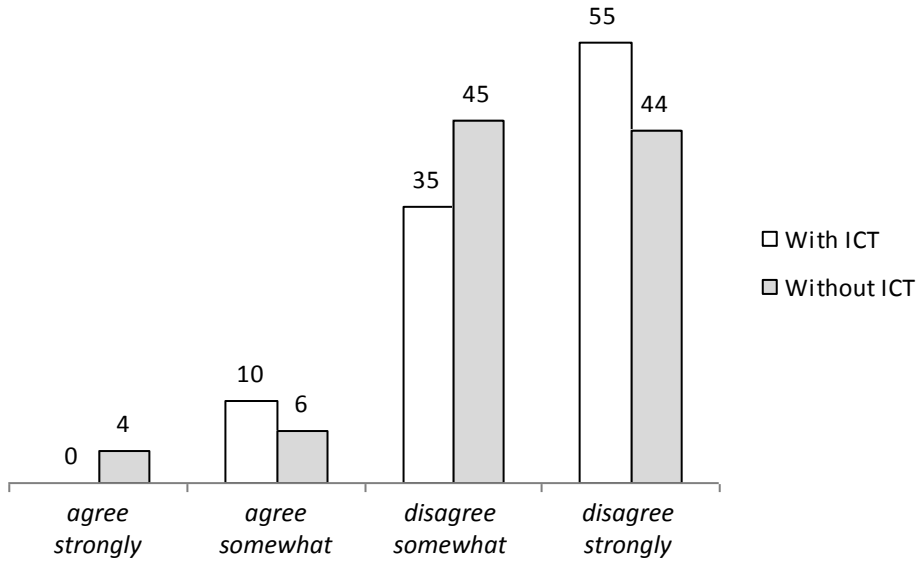


Figure 6.4: "In a class with computers, I am glad that the lesson is over" in %

All in all, many students seem to enjoy using computers, although not all students are equally interested or see it as their hobby. Almost all students find it easy or fairly easy to work with computers, though students that work with ICT in class find it slightly easier. Many students know their way to the internet and use it on a regular basis to obtain information about things they do not understand. Only a few students do not have much affinity with ICT or find it fairly difficult to work with computers. However, you can count them on the fingers of one hand.

Teacher Gijs mentioned in the interview that students stop bringing their laptops to school once they are in their third year. This becomes very clear in the questionnaire, although not immediately (question 2: *Ik gebruik vaak mijn laptop in de les*). At first sight, laptop use in school seems to be equally divided, and without much difference between the two groups that use ICT and do not use ICT during their English lessons, as table 6.4 shows. The standard deviation, however, points to something else. Because of its high value, there are differences between the groups.

Table 6.4 Laptop use in school (in %)

	Often	*Sometimes*	*Rarely*	*Never*	Mean	SD
Classes with ICT	21	27	29	23	2,55	1,13
Classes without ICT	23	29	25	23	2,48	1,18
Total	22	28	27	23	2,52	1,15

The chart below shows a different picture when the school years are taken into consideration.

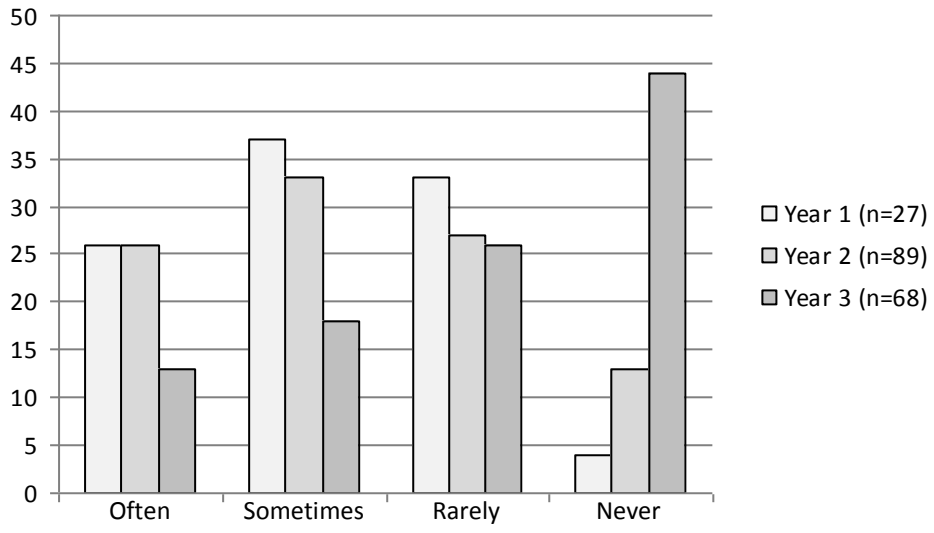
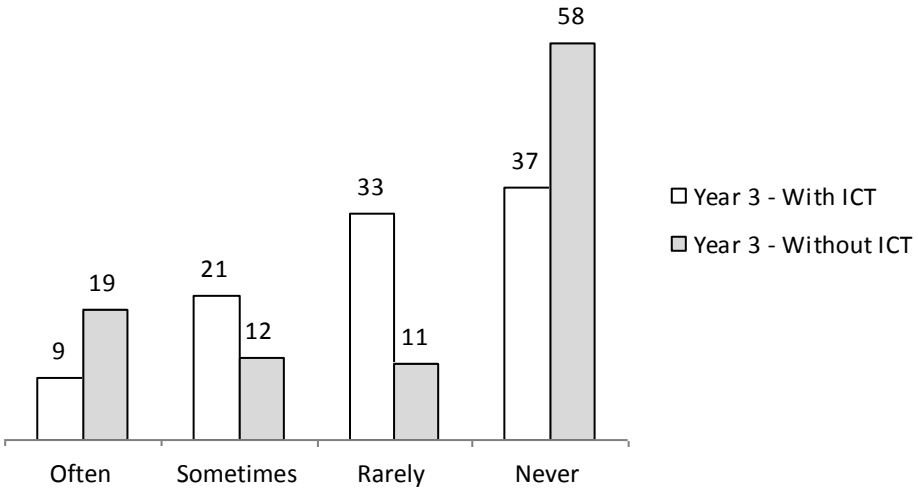


Figure 6.5 Percentage of students' laptop use

The most noticeable thing about this graph is that laptop use decreases sharply once students are in their third school year. As many as 70 percent of the third year students rarely bring their laptops to school, or not at all. This is in sharp contrast to the first and second school year students. Here, only a small minority never uses a laptop in class. Around 60 percent of the first and second class use their laptop often in class, or with some regularity.

Finally, when we zoom in on the third year, we can see that the classes where ICT is not used in their English classes nearly 60 percent indicates that they never use their laptop in school, or in other classes, and leave it at home.



All in all, this confirms the teacher's comment that students tend to stop bringing their laptops to school once they are in their third year. He argued that students leave their laptop at home because it makes no sense for them to take it to school when it is not being used in class, setting a vicious circle in motion.

Nevertheless, students seem quite skilled and well-informed when it comes to using technology, but do they use ICT as a learning tool, too? The next paragraph will look into students' use of ICT tools for language learning.

6.2 ICT for language learning

This paragraph describes how students use computer, laptop, internet and special software for learning English. Table 6.5 shows whether students find it useful to practice the subject matter with the computer (question 11: *Lesstof oefenen met de computer is handig*).

Table 6.5 Practising with the computer is useful

	Very	*Sometimes*	*Not really*	*Not*	Mean	SD
Classes with ICT	26	50	16	7	2,05	0,72
Classes without ICT	31	40	18	10	2,08	0,90
Total	28	46	17	9	2,06	0,80

On average, students "somewhat agree" with the statement that practicing with the computer is handy for learning English. Nearly three quarter of the students sees, at the least, some advantage of using the computer to practice and exercise with the learning material. A quarter sees less or no benefit to using the computer for language learning.

Meestergijs.nl

The website *www.meestergijs.nl*, which teacher Gijs has created on the internet deserves special attention. Through videos and presentations the teacher explains the subject matter and puts students to work with supporting exercises. In their own time and pace, students can watch grammar videos, do exercises and practise their reading, listening, writing and speaking skills. Moreover, the site is completed with an additional list of useful websites.

In his lessons, Gijs mentions his website regularly, for instance as a reference for grammar questions and to encourage students to watch grammar topics and practise their English language skills. Two questions (13 and 14) are dedicated to www.*meestergijs.nl* to find out what students think of this site and how they use it.

Table 6.6 shows whether students find it useful to be able to watch the subject matter over again on the teacher's website (question 13: *Ik vind het nuttig lesstof nog eens terug te kunnen kijken*).

Table 6.6 Useful to be able to see the subject matter back on *www.meestergijs.nl*

	Very	*Rather*	*Not really*	*Not*	Mean	SD
Classes with ICT	42	37	18	3	1,81	0,68
Classes without ICT	27	35	23	14	2,25	1,02
Total	36	36	20	8	1,99	0,86

When this table is displayed in a bar chart, it looks like this:

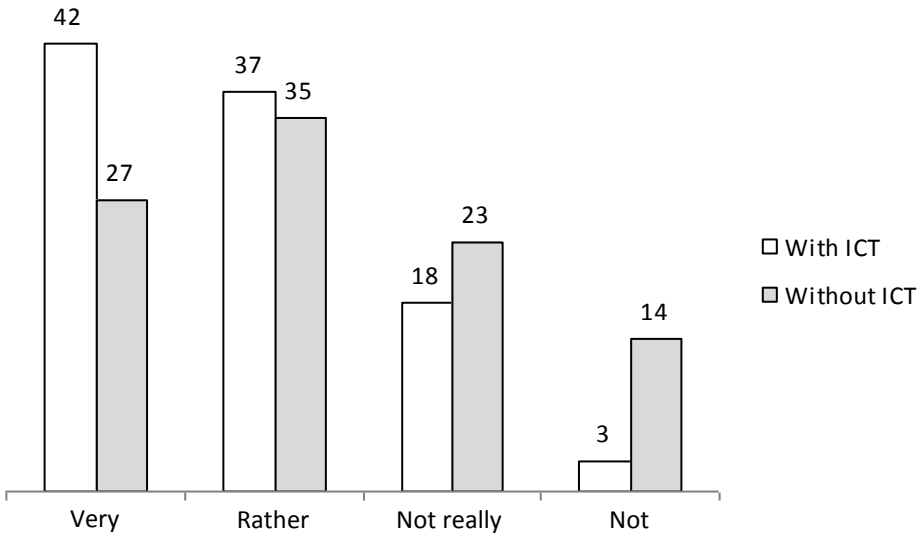


Figure 6.6 "I find it useful to be able to watch the subject matter back on meestergijs.nl" in %

The videos and presentations in which teacher Gijs explains a wide rage of grammar topics certainly seems to meet a need. Overall, more than 70 percent of the students indicate that they find it quite or rather useful to look into the subject matter in their own time and pace. The difference, however, between the classes of teacher Gijs and the classes without ICT is quite significant. In Gijs' classes, nearly 80 percent finds it quite useful to visit his website and watch the explanations of various grammar topics. This is considerably less for the comparison group without ICT, though still a majority (62 percent).

A similar statement shows a similar pattern: "By watching videos, I understand the English grammar better" (question 16), as figure 6.7 shows.

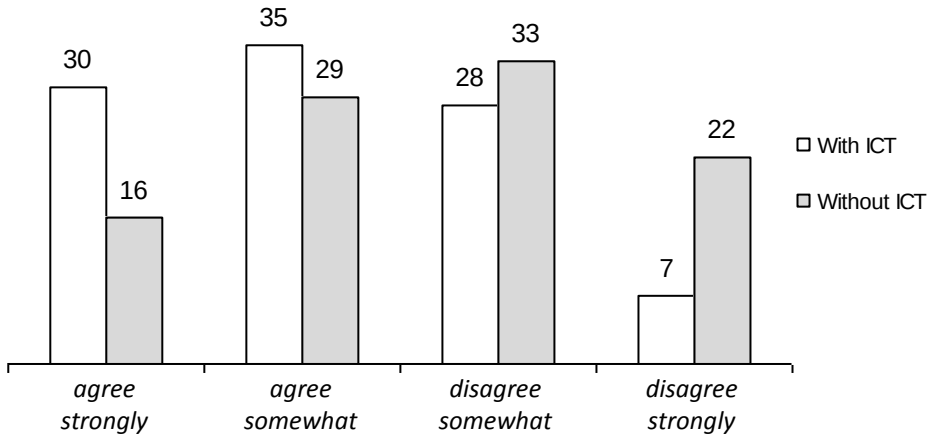


Figure 6.7 "By watching videos, I understand the English grammar better" in %

In this figure, 65 percent of the ICT-classes strongly or somewhat agree with the statement that they understand grammar topics better when they watch videos explaining it, while in the classes without ICT this is much lower: 45 percent. Apparently, there is a relation between the use of the website *meestergijs.nl* in the classroom and home usage.

Meestergijs.nl provides ample opportunities for students to practice their language skills: reading (tips and exercises for reading books, short stories, poems, comics, newspapers and poetry); listening (audio books, videos, music, podcasts, and tips and exercises to learn to listen); writing (tips and exercises for well-written sentences and paragraphs to stories, poems and letters; and speaking (how to give a presentation, engage in a dialogue or improve pronunciation).

Figure 6.8 shows how often students make use of the website for practising (question 14: *Om mijn Engels te oefenen gebruik ik vaak www.meestergijs.nl*).

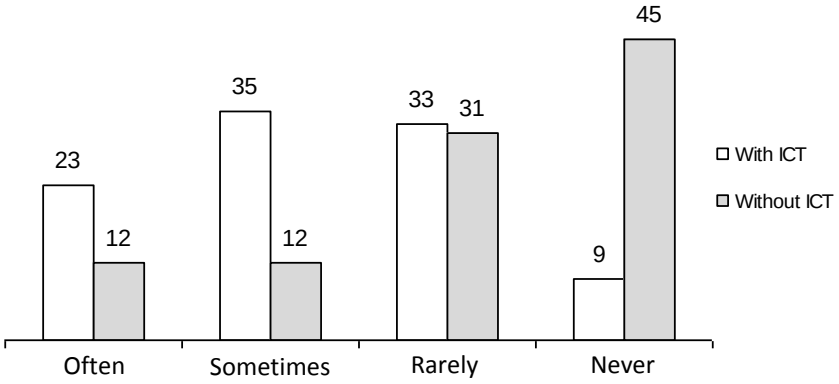


Figure 6.8 "To practice my English I often use www.meestergijs.nl" in %

Here too, there is a noticeable difference between the groups 'with ICT' and 'without ICT': 58 percent of the ICT-group uses the site often or sometimes against 24 percent of the group without ICT. The most noticeable thing about this graph is that 45 percent of the group without ICT indicate that they never use the site *meestergijs.nl* to practice their English language skills. This could mean that these students are not aware of the possibilities this website offers.

When it comes to learning vocabulary, students sometimes prefer to use paper and sometimes *Wrts*, an online testing tool that is widely used by students in secondary schools. Particularly in the way students learn vocabulary, the survey shows mixed results: 60 percent expresses a preference for learning vocabulary on paper (question 9: *Woordjes leren doe ik liever op papier*);

while on the other hand, 70 percent indicates that learning words is easier with *Wrts* (question 15: *Woordjes leren is gemakkelijker met Wrts*). Although the data show a considerable spread over the various groups, there is not a single sub-group that stands out. As far as learning vocabulary is concerned, the opinions are completely divided and seemingly contradict each other. Apparently, students use both ways to learn vocabulary and alternate between paper and vocabulary software.

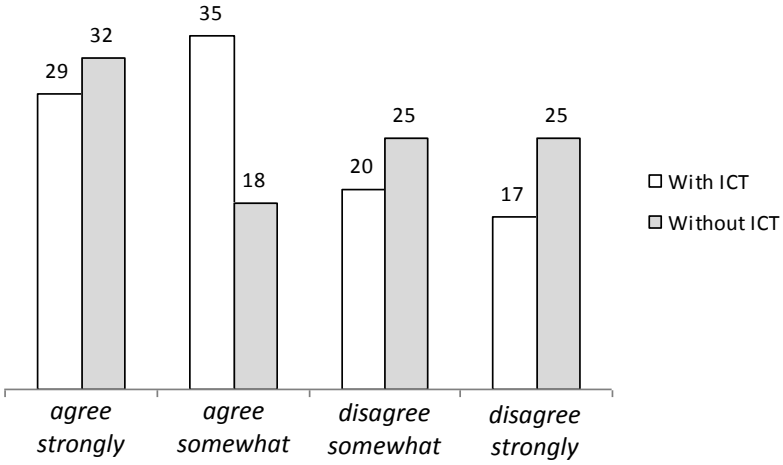


Figure 6.9 "I prefer to learning words on paper" in %

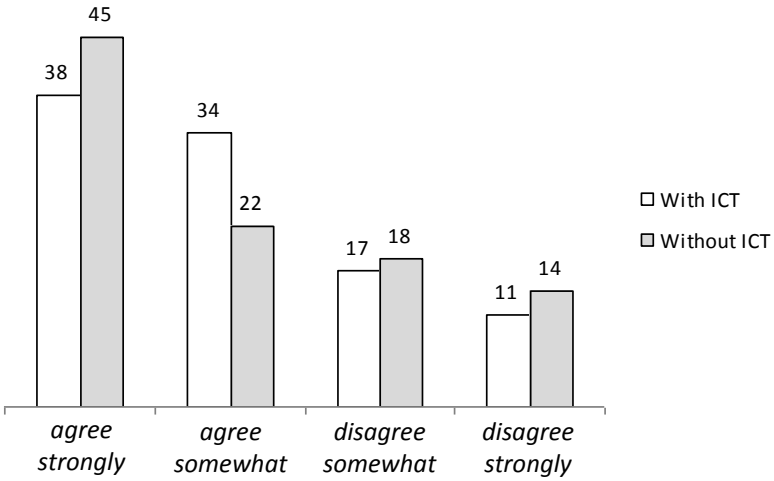


Figure 6.10 "Learning words is easier with Wrts" in %

In sum, students use technology to learn vocabulary, watch grammar videos and practice their language skills. Vocabulary is learned in different ways; students alternate between paper and vocabulary software. More than 70 percent of all respondents find it useful to look into the subject matter in their own time and pace on the teacher's site, and 65 percent of the ICT-group indicate that they understand grammar better when they watch videos explaining it. Nearly half of the group without ICT indicate that they never use the site meestergijs.nl to practice their

English language skills. Apparently, there is a relation between the use of the website *meestergijs.nl* in the classroom and at home. Also, students taught in a more traditional way may not be aware of the possibilities the site offers for language learning.

6.3 Computer vs textbook, pen and paper

Computers are an important part of today's society and a valuable educational tool. However, it looks as though the traditional textbook, pen and paper are far from outdated and also are a good aid to language learning as recent research suggests (see paragraph 3.2 B). Reason to investigate the preference of students: do they prefer computer or textbook, ICT or pen and paper?

Recent research shows that who writes, remembers better. Because pen and paper are actually good for our memory, writing by hand is far from outdated. Laptop users are less able to remember and apply the concepts they have been taught, despite making more notes than students who write by hand. Moreover, handwritten notes appear to help students better to understand lessons straight away. In contrast to studies that attribute this effect to the distracting effects of computers, Mueller & Oppenheimer (2014) state that writing by hand helps to process the content of the lesson and that notes should be taken by hand, and not on a laptop

Following this study, two statements were included in the questionnaire to find out if students think that (1) they remember things better when they write (question 10), and that (2) computers distract them (question 12). For both statements there is hardly any difference between the group with ICT and the comparison group without ICT. Therefore, the scores are shown for the whole group of 184 students.

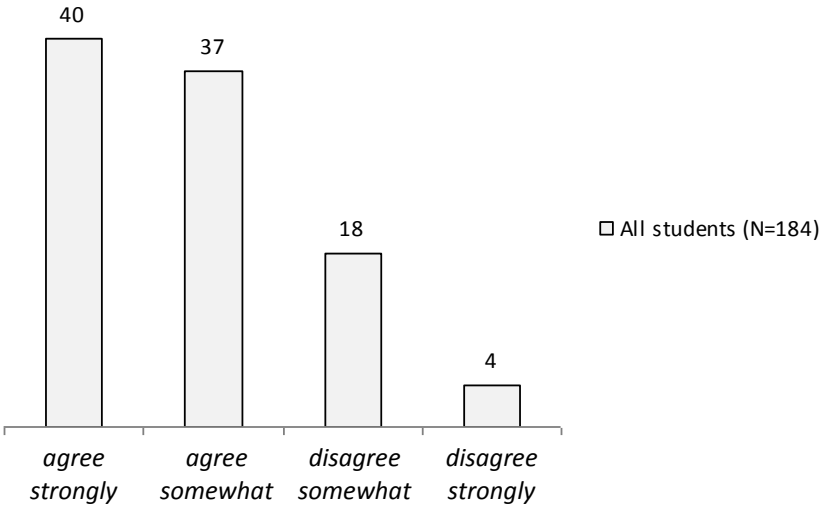


Figure 6.11 Students' response to "If I write, I remember it better than when I type" in %

This figure shows that the majority of students tends to agree with the statement: "If I write, I remember it better than when I type". Nearly three-third of all students underlines this, whether strongly (40 percent) or somewhat (37 percent).

A number of studies argue that the internet and digital tools are making it harder for us to concentrate, although there appears to be no conclusive evidence that student attention spans are declining (Jefferies, 2013).

Figure 6.11 reveals what students think of the distracting factor of ICT (question 12: *Thuis leidt het werken met de computer mij wel erg af).*

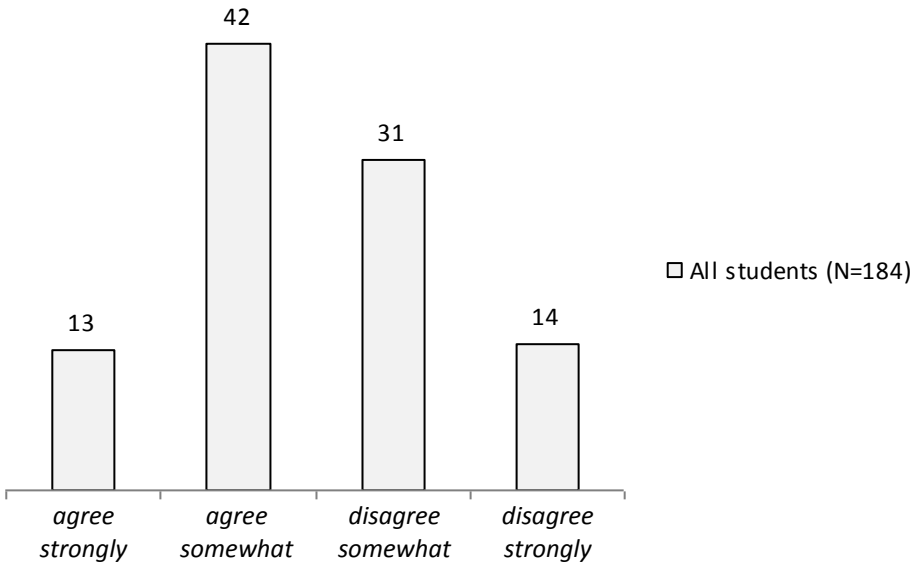


Figure 6.11 Students' response to "Computers are very distracting" in %

The next statement concerns the central question of this paragraph (question 7): do students prefer the computer to the textbook?

Table 6.7 Computer versus textbook (in %)

	Strongly prefer computer	*Somewhat prefer computer*	*Somewhat prefer textbook*	*Strongly prefer textbook*	Mean	SD
Classes with ICT	23	36	33	8	2,26	0,83
Classes without ICT	25	30	30	16	2,36	1,04
Total	24	33	32	11	2,30	0,92

Overall, a slight majority expresses a preference for working with computers to using a textbook.

Nevertheless, more than 40 percent still prefers a textbook. Seemingly, textbooks are still needed to learn a language and will subsist alongside computers. However, the survey also showed that students are rather indifferent in this respect: most of them do not really seem to care whether they work with computers or textbooks (question 8) and both could be used in combination.

Subsequently, the next statement concerns the preference for pen and paper versus working with the computer (question 4: *Ik werk liever met de computer dan met een textboek*), as displayed in table 6.8 on the next page.

Table 6.8 Pen and paper versus computer (in %)

	Strongly prefer pen/paper	*Somewhat prefer pen/paper*	*Somewhat prefer comp.*	*Strongly prefer comp.*	Mean	SD
Classes with ICT	13	36	36	15	2,52	0,81
Classes without ICT	13	38	26	23	2,60	0,97
Total	13	37	32	18	2,55	0,88

Overall, it is literally fifty-fifty. Fifty percent prefers working with pen and paper and fifty percent prefers using the computer. The differences between the groups are rather small. Remarkable, nonetheless, is that the group without ICT expresses quite a strong preference for computers (23 percent).

Preparing for a test is something different in this respect (question 17: *Voorbereiden op een toets doe ik liever met het lesboek*). Table 6.9 shows that around 85 percent of all respondents chooses the textbook to prepare for a test.

Table 6.9 Preparing for a test with textbook (in %)

	Strongly agree (1)	*Somewhat agree (2)*	*Somewhat disagree (3)*	*Strongly disagree (4)*	Mean	SD
Classes with ICT	33	51	14	2	1,85	0,52
Classes without	39	46	12	3	1,78	0,57
Total	36	49	13	2	1,82	0,54

When this table is displayed in a bar chart, it looks like this:

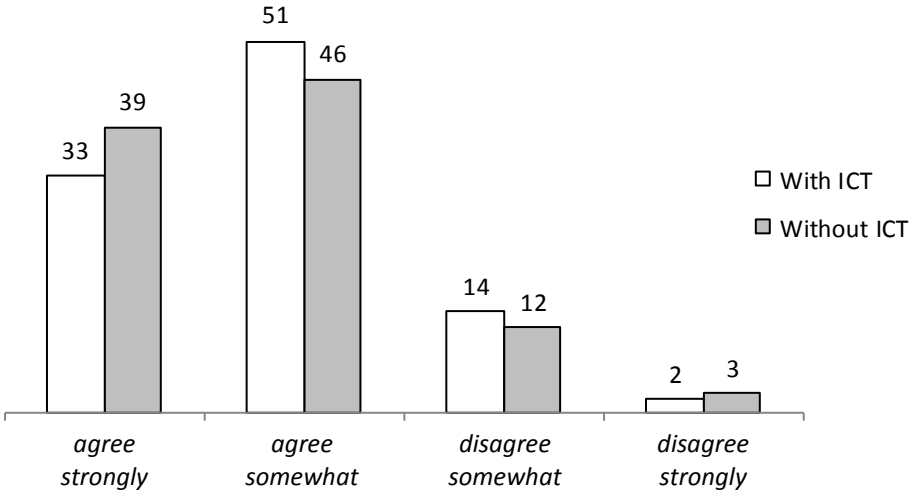


Figure 6.12 "I prefer to use the textbook to prepare for a test" in %

Students are rather enthusiastic about English lessons with internet or ICT (question 21: *Lessen waarin internet of ICT wordt gebruikt, zijn vaak boeiend en interessant*). The overall average centres around "agree somewhat." However, there is quite a difference between the group with ICT and the group without ICT, as can be seen in figure 6.12.

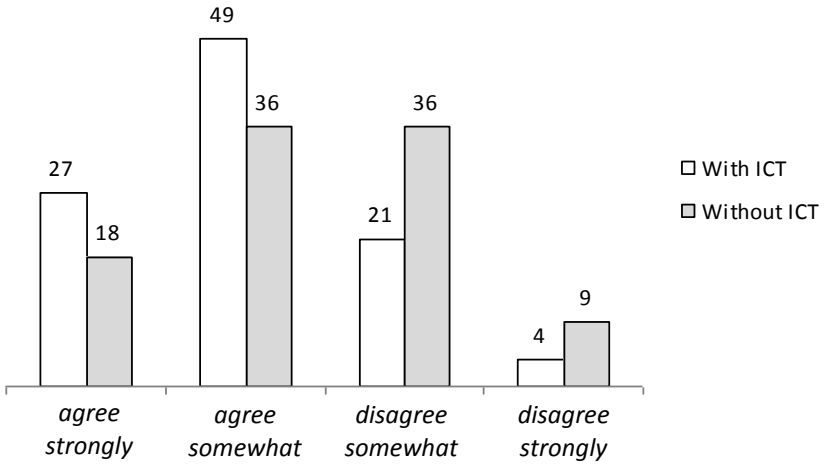


Figure 6.12 "Lessons with ICT or internet are often fascinating / interesting" in %

The figure shows that especially the classes with ICT are enthusiastic about the lessons in which ICT and internet are being used. More than three-quarters find these lessons very or fairly fascinating. This rate is considerably lower in the classes without ICT. Here students are more moderate: just over half of the students find these lessons interesting. Yet, it could also mean that they find lessons without ICT just as interesting. On the whole, however, the group with ICT is quite enthusiastic about the use of internet and ICT in their English lessons.

Finally, figure 6.13 shows students' response to the statement *"I would like to work more with the computer in school"* (question 24).

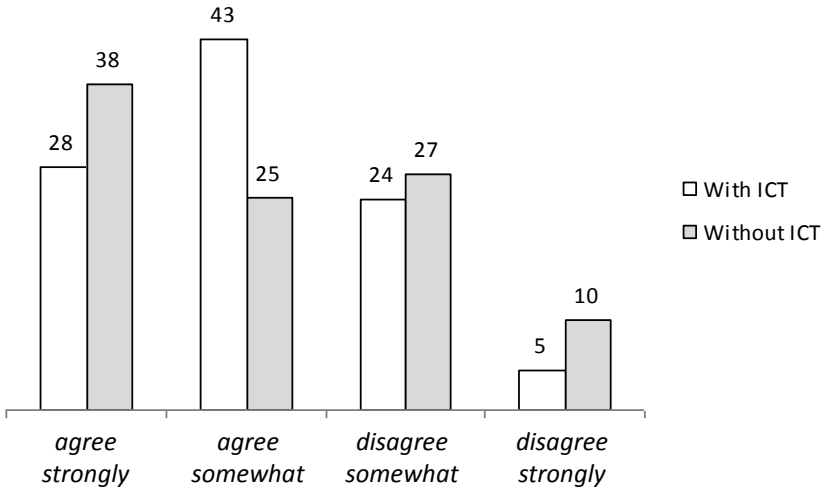


Figure 6.13 "I would like to work more with the computer in school" in %

The figure shows that working with the computer in school is rather popular. Overall, a majority would not mind working more with computers in school. Especially the group without ICT seems rather keen to spend more time in the computer room, as 38 percent wholeheartedly agrees with the statement. About 70 percent of the group with ICT seems pretty satisfied, while 30 percent would not mind bringing it down a little.

Main results student survey

What do students think of working with computers and digital tools in school and at home?

- On average, students acknowledge the importance of computers and internet in their future life. In total, 80 percent underlines this statement, from somewhat to strongly, while twenty percent finds technology, computers and internet less important for their future.
- Students seem to enjoy working with computers. On the whole, a vast majority (86 percent) finds it pleasant, or fairly pleasant.

- Nearly 70 percent of the respondents find it easy to work with computers. The classes that work with ICT find it slightly easier than the classes without ICT. Almost everybody, 96 percent, finds it easy or fairly easy to work with computers. The same applies to creating PowerPoint presentations or working with Word: 95 percent can do that rather well.
- More than one-third of the students indicates that for them a computer is not a pastime.
- Around 90 percent uses the internet if they need to look up things for learning purposes.
- Approximately two-thirds of the survey population uses ICT on a regular base; only a small number never does. Overall, 25 percent claims they use the computer often for their homework, whereby the ICT-classes slightly protrude above the other group.
- Around 90 percent of the respondents indicates that they have no objection to a class in the computer room; on the whole they seem to like it quite a lot.
- Laptop use decreases sharply once students are in their third school year. As many as 70 percent of the third year students rarely bring their laptops to school, or not at all.
- This is in sharp contrast to the first and second school year students. Here, only a small minority never uses a laptop in class. Around 60 percent of the first and second class use their laptop often in class, or with some regularity.

How do students use computers/laptops and internet in general and for language learning?

- On average, students "somewhat agree" with the statement that practicing with the computer is handy for learning English. Nearly three quarter sees, at the least, some advantage of using the computer to practice and exercise with the learning material. A quarter sees less or no benefit to using the computer for language learning.
- More than 70 percent of the students indicate that they find it quite or rather useful to look into the subject matter in their own time and pace. In teacher Gijs' classes, nearly 80 percent finds it quite useful to visit his website and watch the videos and explanations. For the comparison group without ICT this is 62 percent.
- There seems to be a relation between the use of the website *meestergijs.nl* in the classroom and home usage: 65 percent of the ICT-classes strongly or somewhat agree with the statement that they understand grammar topics better when they watch videos explaining it, while in the classes without ICT this is 45 percent.

- 58 percent of the ICT-group uses the teacher's site often or sometimes, against 24 percent of the group without ICT. 45 percent of the group without ICT indicate that they never use the site *meestergijs.nl* to practice their English language skills. This could mean that these students are not aware of the possibilities this website offers.
- As far as learning vocabulary is concerned, the opinions are completely divided and seemingly contradict each other. Students seem to use both ways to learn vocabulary and alternate between paper and vocabulary software.

What do students prefer in the English classroom: computer or textbook, pen or paper?

- The majority of students tends to agree with the statement: "If I write, I remember it better than when I type". Nearly three-third of all students underlines this, whether strongly (40 percent) or somewhat (37 percent).
- A slight majority expresses a preference for working with computers to using a textbook.
- More than 40 percent still prefers a textbook. However, the survey also showed that students are rather indifferent in this respect: most of them do not really seem to care whether they work with computers or textbooks, and both could be used in combination.
- Fifty percent prefers working with pen and paper and fifty percent prefers using the computer. The differences between the groups are rather small. Remarkable is that the group without ICT expresses quite a strong preference for computers (23 percent).
- Around 85 percent of all respondents chooses the textbook to prepare for a test.
- The classes with ICT are quite enthusiastic about the use of internet and ICT in their English lessons.
- Working with the computer in school is rather popular. Overall, a majority would not mind working more with computers in school. Especially the group without ICT seems rather keen to spend more time in the computer room, as 38 percent wholeheartedly agrees with the statement. About 70 percent of the group with ICT seems pretty satisfied, while 30 percent would not mind bringing it down a little.

7 Discussion

As mentioned before, the method of blended language learning is still being developed. Though reports suggest that blended learning is generally effective, there are still many improvements to be made, especially for blended language learning. To accomplish effective second language education, certain elements are most important in the foreign language classroom: a rich learning context, in which learners receive a large amount of comprehensible and varied input in English; with sufficient opportunities to produce English themselves; instruction that focuses on both meaning and form; the use of authentic and meaningful tasks to promote interaction and negotiation of meaning between students; encouragement to using strategies to create meaning; the provision of appropriate feedback to students' English language production; and a focus on an intercultural communication context. Although five lessons are not necessarily representative for the other lessons, most of these elements were missing in the blended English classroom.

Nevertheless, it is rather difficult to implement all these different elements into foreign language education, whether face-to-face, completely online or in a blended form. First of all, students usually only receive two English lessons per week, which means that it is not always possible to provide them with different types of tasks for every language skill in the classroom. Moreover, telecollaboration projects for promoting collaborative writing or intercultural communication have some practical implications and are not easy to incorporate into the curriculum. On the other hand, these practical issues should not stop language teachers from trying to make use of the opportunities of blended language learning. Furthermore, it is easier to change things if ideas are shared and this may yield a network of teachers making collective plans for improving blended language learning.

Finally, the current generation students has their own ideas about modern education and the use of technology, media and ICT. Three 5-vwo students gave a workshop "We are Generation Z!" to trainee teachers at the Utrecht University on 3 November 2014. They taught us that their generation: (1) doubts whether they want to 'digitalise' any further; (2) wants to live in a 'real world' and only use digital means if there is no alternative; and (3) prefers to use laptops outside of class. The results of the student questionnaire are therefore quite interesting as they pinpoint to the fact that ideas of proponents of educational technology are not necessarily the same as those of students. Their views in particular should not be ignored, but taken into consideration at all times.

8 Conclusion

This study aimed to find out how can teachers harness the enormous potential of online technologies and select the best options for blended language learning in the first three years of Dutch secondary school. Five principles of effective blended language learning provided a framework to investigate the incorporation of ICT in modern foreign language education and select the best options for blended language learning.

Five English classes in a blended learning environment were observed and analysed, including the ICT-tools that were used during these lessons. In addition, an interview with the teacher was conducted to find out more about the combination of online and classroom education. The results showed that, in principle, teaching with technology contains many elements that contribute to effective education. Nevertheless, blended learning strongly depends on technical resources, and whenever technology is involved things can go wrong, especially in the classroom. In the observed English classrooms, technology was mainly used to allow the teacher to work according to the flipping the classroom concept. His website offers an online learning environment with online instruction videos and a great many exercises. It also serves as a base for his lessons and a platform to provide feedback and communication opportunities for his students.

There was also room for improvement, especially for blended language learning: some crucial elements were missing or could be improved in the tasks and lessons of the ‘flipped’ classroom. For instance, most tasks merely focused on form and there were hardly any instances where students had to interact, collaborate or negotiate meaning in the target language. These elements are known to be crucial for second language learning, and in this respect, the great potential of blended language learning was not being exploited. Then again, five classroom observations are not necessarily representative for all English classes, making it thus impossible to see all principles being applied.

In addition, a student survey (n = 184) was conducted to investigate students' perceptions of using technology in the classroom and at home. One group of students received English lessons in a blended learning environment; a comparison group received more traditional lessons without using technology. As the results indicated, the overall perceptions of blended language learning were positive. Students like to work with internet and computers, and find it useful to be able to

watch online instruction videos in their own time and pace. The group without ICT seems rather keen to spend more time in the computer room. The group with ICT seems pretty satisfied, while one third would not mind bringing it down a little.

Once students are in their third school year, laptop use in the classroom decreases sharply. As many as 70 percent of the third year students rarely bring their laptops to school, or not at all. This is in sharp contrast to the first and second school year students. Here, only a small minority indicated that they never use a laptop in class.

Although the student survey showed mainly positive perceptions of blended language learning, both groups also show preferences for using pen, paper and textbook, suggesting that a combination of digital and traditional methods is the best option for them, so that they are able to alternate between digital and more tangible forms of learning. For teachers, this means choosing the best of both worlds to develop the best blended learning environment possible suited to the needs of language learners.

This study has outlined a number of principles for blended language learning that provide a foundation upon which to develop the best environment possible for blended language learning. First and foremost, the principles of effective language teaching and learning should remain paramount, keeping teaching methodology ahead of technology. Secondly, teachers should be very selective about adopting new technology and social media tools into their online and blended subjects. Thirdly, it is important to maintain effective levels of cognitive, social and teaching presence in the online or blended learning environment. Fourthly, the crucial components of the online or blended learning environment must be aligned. Finally, an online or blended learning environment requires a supportive environment, with opportunities for feedback and communication. These five principles will not guarantee a perfect blend, but are important factors that contribute to an efficient and effective blended learning environment. After all, the most important aim of blended learning is to find the most effective and efficient combination of learning modes to create a learning environment that works as a whole.

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Appendices

Appendix A: Observation scheme

Part A of observation scheme for lesson ….

Time	*Teacher*	*Students*	*Work Form*

Part B of observation scheme for lesson ….

Points of interest	*Notes*
Technology/ICT	
Individual differences	
Student independence	
Student interaction	
Teacher guidance	

Appendix B: Criteria for analysing lessons and tools

- What is the aim of the lesson?
- Did the teacher give clear instructions and explanations?
- Was there sufficient challenge for students regarding the tasks and exercises?
- Were individual differences between students taken into account?
- Was the class time well spent in an "engaged" way?
- Was the feedback provided in time?
- Are the relationships between teacher and students positive?
- Did the lesson focus on the principles of effective teaching and learning?
  - a rich learning context, with comprehensible and varied input in English?
  - sufficient opportunities to produce English?
  - a focuses on both meaning or form, or both?
  - authentic and meaningful tasks and exercises for students?
  - the use of strategies stimulated?
  - appropriate feedback provided?
  - attention for an intercultural context?
- Were the various components aligned and the lesson coherent, including meaningful learning objectives, a learner-centred approach, an active role for students?
- Was the teaching presence, social presence and cognitive presence maintained?
  - Did the teacher focus on the design, facilitation, and direction of the learning process?
  - Did students comprehend their roles and responsibilities?
  - Did the teacher establish a clear and open way to communicate, also online?
- Were the technical tools reliable, easy to use, and up to date and functioning?
- Were the ICT-tools well chosen?
- Where students able to use different media?
- Was the classroom a supportive environment in the classroom with opportunities for feedback and communication?

Appendix C: Student questionnaire

Dit is een vragenlijst over het ICT-gebruik op jouw school en in de klas. Internet, mobiel, tablet, laptop, maar ook zelf presentaties maken hoort daar bijvoorbeeld bij. We willen graag weten hoe ICT wordt gebruikt en wat je daar van vindt. Het gaat om jouw persoonlijke mening. Daarom hoef je nergens je naam in te vullen. Als dank wordt er in jouw klas een doos chocolaatjes verloot.

	Helemaal mee eens	*Een beetje mee eens*	*Niet zo mee eens*	*Helemaal niet mee eens*
Als ik iets niet begrijp zoek ik het op internet.				
Ik gebruik vaak mijn laptop in de les.				
Thuis werk ik veel op de computer voor mijn huiswerk.				
Ik werk liever met pen en papier dan met de computer.				
Ik vind het werken met computers prettig.				
Ik vind het werken met computers moeilijk.				
Ik werk liever met de computer dan met een lesboek.				
Mij maakt het niet uit of ik met de computer of een lesboek werk.				
Woordjes leren doe ik liever op papier.				
Als ik dingen opschrijf onthoud ik het beter dan als ik het typ.				
Lesstof oefenen met de computer is handig.				
Thuis leidt het werken met de computer mij wel erg af.				
Ik vind het nuttig om lesstof nog eens terug te kijken op bijv. www.*meestergijs.nl*				
Om mijn Engels te oefenen gebruik ik vaak *www.meestergijs.nl.*				
Woordjes leren is gemakkelijker met bijv. Wrts.				
Door video's te kijken snap ik de grammatica veel beter.				
Voorbereiden op een toets doe ik liever met het lesboek.				
De computer zal niet gauw een hobby van mij worden.				
Werken met de computer krijg ik maar niet onder de knie.				
Vooral bij een lesuur met computers ben ik blij dat de les voorbij is.				
Lessen waarin internet of ICT wordt gebruikt, zijn vaak boeiend en interessant.				
PowerPoints maken of werken met Word is gemakkelijk.				
In je latere leven kun je best zonder computers of internet.				
Ik zou liever meer met de computer werken op school.				

Appendix D: Data student survey

Vraag 1 **Als ik iets niet begrijp zoek ik het op internet.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	46	53	7	1	107	43	50	7	1	100	1,65	-0,03	0,41	-0,22
Without	36	32	4	4	76	47	42	5	5	100	1,68		0,64	
Totaal	82	85	11	5	183	45	46	6	3	100	1,67		0,51	

Vraag 2 **Ik gebruik vaak mijn laptop in de les.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	22	29	31	25	107	21	27	29	23	100	2,55	0,07	1,13	-0,06
Without	18	22	19	18	77	23	29	25	23	100	2,48		1,18	
Totaal	40	51	50	43	184	22	28	27	23	100	2,52		1,15	

Vraag 3 **Thuis werk ik veel op de computer voor mijn huiswerk.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	30	39	29	9	107	28	36	27	8	100	2,16	-0,09	0,86	0,10
Without	16	31	23	6	76	21	41	30	8	100	2,25		0,77	
Totaal	46	70	52	15	183	25	38	28	8	100	2,20		0,82	

Vraag 4 **Ik werk liever met pen en papier dan met de computer.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	14	39	38	16	107	13	36	36	15	100	2,52	-0,07	0,81	-0,16
Without	10	29	20	18	77	13	38	26	23	100	2,60		0,97	
Totaal	24	68	58	34	184	13	37	32	18	100	2,55		0,88	

Vraag 5 **Ik vind het werken met computers prettig.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	47	45	10	5	107	44	42	9	5	100	1,75	0,12	0,66	0,13
Without	39	26	11	0	76	51	34	14	0	100	1,63		0,52	
Totaal	86	71	21	5	183	47	39	11	3	100	1,70		0,60	

Vraag 6 **Ik vind het werken met computers moeilijk.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	1	1	27	78	107	1	1	25	73	100	3,70	0,15	0,28	-0,12
Without	0	6	21	47	74	0	8	28	64	100	3,55		0,41	
Totaal	1	7	48	125	181	1	4	27	69	100	3,64		0,34	

Vraag 7 **Ik werk liever met de computer dan met een lesboek.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	25	38	35	9	107	23	36	33	8	100	2,26	-0,10	0,83	-0,21
Without	19	23	23	12	77	25	30	30	16	100	2,36		1,04	
Totaal	44	61	58	21	184	24	33	32	11	100	2,30		0,92	

Vraag 8 **Mij maakt het niet uit of ik met computer of lesboek werk.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	18	33	36	9	96	19	34	38	9	100	2,38	-0,03	0,80	0,04
Without	10	36	21	10	77	13	47	27	13	100	2,40		0,76	
Totaal	28	69	57	19	173	16	40	33	11	100	2,39		0,78	

Vraag 9 **Woordjes leren doe ik liever op papier.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	31	37	21	18	107	29	35	20	17	100	2,24	-0,17	1,10	-0,29
Without	25	14	19	19	77	32	18	25	25	100	2,42		1,39	
Totaal	56	51	40	37	184	30	28	22	20	100	2,32		1,23	

Vraag 10 **Als ik dingen opschrijf onthoud ik het beter dan als ik het typ.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	44	39	19	4	106	42	37	18	4	100	1,84	-0,06	0,72	-0,05
Without	30	29	14	4	77	39	38	18	5	100	1,90		0,77	
Totaal	74	68	33	8	183	40	37	18	4	100	1,86		0,74	

Vraag 11 **Lesstof oefenen met de computer is handig.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	28	54	17	8	107	26	50	16	7	100	2,05	-0,03	0,72	-0,19
Without	24	31	14	8	77	31	40	18	10	100	2,08		0,90	
Totaal	52	85	31	16	184	28	46	17	9	100	2,06		0,80	

Vraag 12 **Thuis leidt het werken met de computer mij wel erg af.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	13	45	35	13	106	12	42	33	12	100	2,45	0,00	0,74	-0,11
Without	11	32	22	12	77	14	42	29	16	100	2,45		0,85	
Totaal	24	77	57	25	183	13	42	31	14	100	2,45		0,78	

Vraag 13 **Ik vind het nuttig om lesstof nog eens terug te kijken op bijv. www.meestergijs.nl.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	45	40	19	3	107	42	37	18	3	100	1,81	-0,43	0,68	-0,34
Without	21	27	18	11	77	27	35	23	14	100	2,25		1,02	
Totaal	66	67	37	14	184	36	36	20	8	100	1,99		0,86	

Vraag 14 **Om te oefenen gebruik ik vaak www.meestergijs.nl.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	25	37	35	10	107	23	35	33	9	100	2,28	-0,82	0,86	-0,17
Without	9	9	24	35	77	12	12	31	45	100	3,10		1,03	
Totaal	34	46	59	45	184	18	25	32	24	100	2,63		1,09	

Vraag 15 **Woordjes leren is gemakkelijker met bijv. Wrts.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	41	36	18	12	107	38	34	17	11	100	2,01	0,00	1,00	-0,21
Without	35	17	14	11	77	45	22	18	14	100	2,01		1,21	
Totaal	76	53	32	23	184	41	29	17	13	100	2,01		1,09	

Vraag 16 **Door video's te kijken snap ik de grammatica veel beter.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	32	37	30	8	107	30	35	28	7	100	2,13	-0,49	0,86	-0,14
Without	12	22	25	17	76	16	29	33	22	100	2,62		1,00	
Totaal	44	59	55	25	183	24	32	30	14	100	2,33		0,98	

Vraag 17 **Voorbereiden op een toets doe ik liever met het lesboek.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	35	55	15	2	107	33	51	14	2	100	1,85	0,07	0,52	-0,05
Without	30	35	9	2	76	39	46	12	3	100	1,78		0,57	
Totaal	65	90	24	4	183	36	49	13	2	100	1,82		0,54	

Vraag 18 **De computer zal niet gauw een hobby van mij worden.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	8	30	38	31	107	7	28	36	29	100	2,86	0,07	0,85	-0,05
Without	9	17	31	19	76	12	22	41	25	100	2,79		0,90	
Totaal	17	47	69	50	183	9	26	38	27	100	2,83		0,87	

Vraag 19 **Werken met de computer krijg ik maar niet onder de knie.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	0	4	29	74	107	0	4	27	69	100	3,65	-0,07	0,30	-0,05
Without	1	3	12	61	77	1	4	16	79	100	3,73		0,35	
Totaal	1	7	41	135	184	1	4	22	73	100	3,68		0,32	

Vraag 20 **Bij een lesuur met computers ben ik blij dat de les voorbij is.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	0	11	37	59	107	0	10	35	55	100	3,45	0,15	0,45	-0,12
Without	3	5	35	34	77	4	6	45	44	100	3,30		0,57	
Totaal	3	16	72	93	184	2	9	39	51	100	3,39		0,51	

Vraag 21 **Lessen waarin internet of ICT wordt gebruikt, zijn vaak boeiend / interessant.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	29	52	22	4	107	27	49	21	4	100	2,01	-0,35	0,63	-0,15
Without	14	28	28	7	77	18	36	36	9	100	2,36		0,78	
Totaal	43	80	50	11	184	23	43	27	6	100	2,16		0,72	

Vraag 22 **PowerPoints maken of werken met Word is gemakkelijk**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	68	34	5	0	107	64	32	5	0	100	1,41	-0,04	0,34	-0,15
Without	49	23	3	2	77	64	30	4	3	100	1,45		0,48	
Totaal	117	57	8	2	184	64	31	4	1	100	1,43		0,40	

Vraag 23 **In je latere leven kun je best zonder computers of internet.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	6	17	41	43	107	6	16	38	40	100	3,13	-0,09	0,77	0,10
Without	2	13	28	34	77	3	17	36	44	100	3,22		0,67	
Totaal	8	30	69	77	184	4	16	38	42	100	3,17		0,73	

Vraag 24 **Ik zou liever meer met de computer werken op school.**

	aantal					%					Gem.	verschil	(sd)	verschil
	1	2	3	4		1	2	3	4					
ICT	30	46	26	5	107	28	43	24	5	100	2,06	-0,05	0,71	-0,35
Without	29	19	21	8	77	38	25	27	10	100	2,10		1,05	
Totaal	59	65	47	13	184	32	35	26	7	100	2,08		0,85	