An evaluation of Duolingo as a CALL resource for upper-secondary English L2 classrooms in Sweden

Author: Gustav Andersson
Id no 19930615
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Supervisor: Dr. Damon Tutunjian
Abstract
The usage of digital tools for learning in today’s classroom is increasing in pace with our technological developments in our digitized society. This has created several digital language learning platforms that are now available for students and teachers to use for learning. It can be difficult to determine the quality of any learning material and especially new material. In this study, I will examine how well the computer-assisted language learning (CALL) material Duolingo functions as a learning tool for upper-secondary language learning. The purpose of choosing Duolingo was to investigate what qualities modern language learning tools have and to stress the importance of evaluating materials before using them. This was done by evaluating Duolingo in three steps, in an external, internal, and overall process. The evaluating process determines the structure, content and, function of Duolingo as a CALL-material. In the evaluation, pedagogical principles and the English syllabus were used to investigate if Duolingo could be used for educational purposes. The research questions for this study are how appropriate Duolingo is as an educational resource for English upper-secondary school learning and how well it meets the directive of promoting digital tools for knowledge acquisition, communication, and learning. The overall result shows that Duolingo could function as supplementary material but not as the main material since it does not cover the communicative aspects of language learning and works solely with rule-based competence. While Duolingo meets syllabus directives with respect to knowledge acquisition and learning if used for working on grammar and form, it lacks communicative elements and therefore does not support the broad communicative goals of the English subject in upper-secondary school.
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1. Introduction

Today’s society is becoming more and more digitized every day. A study conducted by Amanda Glimstedt, Gunilla Elber, Frances Hultgren and Monika Johansson (2015) shows that three out of four nine-year-olds use digital platforms daily. The younger generations are growing up with technology as a natural part of their lives. Ulf Jämterud (2010) describes this generation as “digital natives” since their natural habitat includes digital tools. Teachers today are not from the digital native generation. Therefore, teachers must adapt to their students’ usage of technology. Schools have a great responsibility to provide an environment in which teachers can help students develop their digital competence. In the Swedish context, the National Agency for Education (Skolverket) formulates this responsibility by specifying digital competence goals for all the subjects in the revised curriculum for compulsory school (Skolverket, 2011). The intention is that every student should be able to use digital tools for knowledge acquisition which is a general term for identifying knowledge from existing sources, communication that is interpersonal and not one-sided, and digital tools that give learners the opportunity to develop their communicative abilities. Similar goals are also found in the official commentary on the syllabus in Skolverket’s supporting material for upper-secondary studies in Sweden. For example, in regard to the use of digital tools, it is stated that:

Knowledge of digital tools and media and skills in using them comprises a learning goal itself. Furthermore, the education needs to be deliberately organized and implemented so that the digital tools are truly used in such a way that they support the students’ learning…. In order to live up to this requirement, certain conditions must be met. Among other things, it is stated in the curriculum that the principal/rector is responsible for ensuring that the schools work environment is formed in such way that students have access to high-quality learning material and other learning tools suitable for a contemporary education.) (Skolverket, 2011, pp. 13-14)

Taken together, such statements act as a directive for teachers to move away from traditional teaching and develop their knowledge of digital tools for learning.
Recent research supports the importance of making such a shift. Marta Goméz Domingo and Badia Garganté (2015) show that student motivation for learning and the degree of their involvement in their development is enhanced when digital tools are integrated into their education. Mobile applications provide one means by which teachers can integrate digital tools into traditional education; however, the application that the teacher uses should contribute something new that does not exist in traditional materials. A number of studies show the advantage of using mobile apps for learning, that mobile apps can contribute to engagement and the motivation of students and enhance individual learning (Goméz Domingo and Badia Garganté 2015; Letty Contreras, Sandra Charry and Angela Castro 2016; Carol Chapelle 2007; Philip Hubbard 2009). However, as Zhang and Liao (2015) argue, it is not enough to transform a book into a digital tool. The digital version of a book has to provide the reader with more details or information e.g. pictures and audio in order for it to be effective. Both Goméz Domingo and Badia Garganté (2015) and Zhang and Liao (2015) argue that mobile apps can help students to retain their focus longer in the classroom. Furthermore, both groups claim that mobile apps provide students with variation in their education and support the learning process.

One area of learning in which the use of mobile apps is common is language learning. The thought of learning a language just by playing on a mobile app for ten-twenty minutes a day is appealing, and thus mobile apps have recently emerged as an accessible and enjoyable means of language learning. One such app, Duolingo, has more than 200 million users all over the world (Duolingo 2018a). Given the popularity of such apps and the potential benefits for the learning process, it is worthwhile to consider their incorporation as a digital tool in the classroom. In this study, I will evaluate whether the language learning app Duolingo can be used as a good digital tool in Swedish upper-secondary school English courses to help enhance student knowledge acquisition, communication, and learning.

1.2 Research questions

The purpose of this study is to conduct a materials evaluation of Duolingo in order to investigate whether it functions as a suitable digital tool, given the goals of the subject syllabus. I will investigate if Duolingo is a digital tool that can achieve the goals of digital competence regarding knowledge acquisition, communication, and learning. These goals are deemed necessary for the Swedish upper-secondary L2 classroom. In accordance with the Skolverket’s (2011) supporting material for upper-secondary studies in Sweden, I believe it is
essential for teachers today to adapt to our digitized society and incorporate activities that students do in their spare time, such as mobile phone usage, into the classroom. However, the incorporation of mobile phone usage must serve an educational purpose. This study, therefore, aims to determine whether Duolingo has the pedagogical qualities in regard to structure, content, and pedagogical method that previous research has shown is necessary for an educational tool to have. To do this, I will address the following questions:

1. How appropriate is Duolingo as an educational resource for English upper-secondary school learning?

2. How well does it meet the directive of promoting digital tools for knowledge acquisition, communication, and learning?

2. Theoretical background

In the theoretical background, I will review research on computer-assisted language learning (CALL) and present studies that discuss the history of CALL. I will then examine methods of material evaluation principles that previous evaluators have used to assess CALL materials and will identify what researchers believe is essential during the process.

2.1 Computer-assisted language learning

The concept CALL refers to the use of technology in language learning. CALL is used as the general term to refer to any digital tool used for an educational purpose. Michael Levy (1997) states that CALL is the study of applications of the computer in language teaching and learning. Such applications developed throughout the years with the growth of computer technology. Early attempts were made to teach foreign languages on computers in the 1950s and 60s without success, and it was not until the early 1980s with the technological development of computers, that the field of CALL began (Hubbard, 2009). The usage of digital tools for language learning has grown a lot over the past decade and is now, in one way or another, part of every classroom. Hubbard defines CALL as any process where a learner uses a computer and has the opportunity to develop his or her language, where computer use includes the network connecting them with technological innovations such as mobile phones and electronic whiteboards. Ilona Vandergriff (2016) explain that
technology has affected language learning in complex ways over the past three decades. Vandergriff argues that CALL was often used in human-computer interaction rather than human-to-human interaction through a digital tool. Audio-lingual methods dominated, and the learning process often focused on accuracy. Chapelle (2010) states that CALL can be used to interactive media for exercises, electronic materials such as online dictionaries and electronic communication in the language that is learned. She argues that CALL has created possibilities for all educational institutions since there is no longer a significant difference in price or accessibility between CALL-materials and traditional materials such as textbooks. Hubbard (2009) argues that CALL can improve learning efficiency and effectiveness since he believes that learners get access to more significant material which can motivate students.

A number of researchers have investigated the efficacy of CALL-based approaches in the classroom. Contreras, Charry, and Castro (2016) have studied how the implementation of CALL with a podcast, PowerPoint, and video projects could help develop speaking skills for Colombian non-native-speaker students in the sixth grade. The students in the study were considered to be “digital natives” and in need of pedagogical alternatives to motivate their language learning skills. The study thus aimed at developing an understanding of how educational practices can be improved through the use of digital tools. Contreras, Charry, and Castro used a mixed-methods approach to be able to investigate beyond the representation of quantities to create an understanding of the student’s perspective by doing a qualitative analysis: the methods used are focus-groups interviews and participant observations. The findings determined that students were in need of more vocabulary in language education to improve their English language skills. Contreras, Charry, and Castro argue that this can be achieved with strategies that engage students and motivate meaningful learning over time and that CALL-materials help to accomplish this.

Another study by Martha Devia and Andersson Garcia (2017) studied the impact of using a podcast as a digital tool in the classroom to increase the alternatives and variety of language learning methods. The purpose of the study was to determine whether or not podcasts could be used as a digital tool to help students improve their oral skills. The study used a survey for data collection which included 40 students between the ages thirteen to seventeen who all were self-identified as wanting to improve their speaking skills in a second language. The researchers found that the use of digital tools such as podcasting was suitable to help these students improve their speaking skills. It helped students feel more comfortable and confident
Speaking face to face with each other since the podcast helped them to self-regulate and prepare for speaking.

A podcast is one of many digital tools that potentially can be used for language learning. Contreras, Charry, and Castro (2016) discuss the development that information and knowledge are accessible everywhere today through digital tools. Contreras, Charry, and Castro determine that information technology (IT) has had a positive impact in developing strategies for language learning. IT has contributed to new and innovative approaches in language education mostly by providing applications and computer programs that can provide data and knowledge which incorporate IT into CALL-materials. IT is growing and becoming more accessible to larger parts of the population, which means that CALL-materials and educational systems will be affected by its growth.

Studies from Contreras, Charry, and Castro (2016) and Devia and Garcia (2017) demonstrate that CALL-materials which offer pedagogical learning material can be used to help improve students’ knowledge acquisition, communication, and learning. However, it can still be challenging to integrate CALL-materials into the classroom teaching. Hubbard (2006) argues that many language teachers have limited experience working with CALL-materials and might not be used to spending time working with digital tools for teaching. Hubbard argues that a teacher’s limited experience with digital tools can become problematic for a student’s habits of using technology since working with CALL is different from working with traditional materials. Chapelle (2010) explains the fact that CALL-materials can include a lot more than what is possible to print in a textbook. CALL-materials with IT included is growing in many ways, Chapelle describes the spread of CALL as both horizontal and vertical. The horizontal spread of technology takes language learning to learners all over the world. The vertical range is the growing impact of CALL-materials has on language education and its curriculum, and therefore I believe that it is becoming increasingly important to evaluate CALL-materials.

2.2 Materials evaluation to evaluate the effectiveness of CALL resources

Evaluation is a systematic process that determines the function and significance of an object or material (Chapelle, 2010). Chapelle identifies the difficulty of defining why materials are useful or not for language learning. She argues that although evaluation methods provide guidelines to seek, gather and interpret data that can help evaluators make a judgment about
the evaluated material, most of the evaluation methods only scratch the surface of why a material is useful or not. Defining quality is difficult since the term can be subjective to the teacher and the users. However, some studies have worked with criteria and methods that can be helpful for evaluating materials and their quality as pedagogical tools for learning.

Including criteria and methods from previous research which determine the quality of traditional materials, can be helpful for evaluating CALL-materials since there are similarities in the evaluation process of traditional materials. According to Hubbard (2006), when teachers evaluate textbook materials, teachers are working with something familiar and recognized as is part of the tradition of teaching. Textbooks tend to be straightforward to evaluate due to their structure and content, and students mostly work with their textbooks from the beginning until the end. Teachers can, therefore, benefit from receiving instructions on how to evaluate textbook materials before evaluating CALL-materials. One factor to take into account is that every teacher and classroom is unique. Claire Bradin (1999) states that language teachers may perceive CALL differently from more experienced CALL users, which makes the overall evaluation a challenge. In an educational environment, the more experienced CALL users are most likely the students. The different experience can create a gap between the teacher and the student’s expectations of digital tools in the classroom. Early research on CALL (Chapelle, 2010) often compared the learning outcomes between a control group using traditional learning material and an experimental group using CALL. This kind of comparison/method is still a standard way of conducting research today to find out if CALL-materials have a positive or negative effect on students compared to the group using the traditional material. Chapelle argues that the result of comparative studies on CALL versus non-computer-assisted learning cannot be generalized since it can be difficult to know the exact reason for a group of students’ results.

To be able to define the quality of digital tools, it is important to work with a well-planned systematic evaluation process. Comparing learning outcomes from control groups can be difficult when determining the reason for a “negative” result. Brian Tomlinson uses the following definition: “Materials evaluation is a procedure that involves measuring the value (or potential value) of a set of learning materials” (2003a, p 15). Evaluation, according to Tomlinson, requires focusing on the learner’s needs, and since not all material is suitable for every learner, the evaluators must make a judgment of the potential effectiveness of the material for their students. Evaluations are conducted on three possible stages of use: pre-use,
in-use, or post-use. The most important stage is the pre-use stage where we measure what teachers can potentially accomplish via the use of the materials. The pre-use evaluation is important since it helps teachers create an understanding of the material and helps them to determine whether or not it should be used in the classroom or not. A pre-use evaluation is also possible to conduct for evaluators who do not have access to in-use with learners. The strategies for pre-use evaluation are slightly different depending on what principles or framework the evaluator is using.

This study focuses on three relevant strategies for evaluating materials in at the pre-use stage. The three strategies are Tomlinson’s (2003b) principles of second-language learning; Hubbard’s (2006) framework for evaluating CALL-materials; and Jo McDonough, Christopher Shaw and Hitomi Masuhara’s (2013) materials evaluation method which uses internal, external and overall methods for evaluating materials. In the evaluation process, Rod Ellis (2005) principles of language teaching pedagogy are integrated to create an understating for how well the material can function for educational purposes.

These principles from Ellis (2005) were created to try to draw together some general principles for language acquisition, principles that can serve as a basis for language teaching. Ellis identifies two areas of language competence that are important to develop for learners. These two areas are formulaic expressions and rule-based competence. Formulaic expressions focus on the fluency in a language which in a study by Pauline Foster (2001) shows that native speakers use a more automatic language that L2 learners often need to develop. Rule-based competence is the area of language that focuses on form and grammar, which Ellis considers important for developing within a language. To develop within these two areas of language learning, it is important to create a suitable learning process. Ellis argues that authentic material focusing on meaning is vital for this. Communicative activities in the target language between learners that create authentic input and output create a good learning process. By having activities focusing on authentic material and meaning the learners’ engagement increases and their implicit knowledge develops. Lastly, it is important for the teacher to take account of the learner’s built-in syllabus before choosing materials. A built-in syllabus is the student’s individual capacity for learning. Students develop individually within a language at different speeds. Tomlinson (2003b) use similar principles on how second language learning should be taught. He states the importance of using an authentic material to create an attractive and appealing content. Tomlinson recommends using a material with rich
input that works with planned, semi-planned and unplanned conversation to stimulate students.

Ellis and Tomlinson use principles that can be used to make language learning effective and attractive for learners. To judge if a material is useful or not in practice, Hubbard (2006) created a CALL-materials evaluation which functions as a general evaluation framework. Educational materials are normally evaluated by teachers in their own classes. Teachers have an understanding of the digital tools that are available in the institution, relevant information about other course material and knowledge about the objectives of the given course. Lastly, the teacher has their perception of how the learning process is supposed to be and what would be best for the specific class and course. Hubbard writes that it is important to identify the students and the primary objectives of the program before conducting a materials evaluation. Hubbard (2006) recommend a framework that is useful for increasing teachers will to evaluate materials. He adapted the framework from Hubbard (1988) using these following stages in short:

**Table 1. Software Evaluation Framework: Core components. Hubbard (2006)**

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<tr>
<td>1. <strong>Technical preview</strong>: Look at whether the material the teacher wants to use is suitable for the equipment the institution has or that the students can use.</td>
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<td>2. <strong>Operational description</strong>: Develop an understanding of the material and the learning style it supports before judging its qualities.</td>
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<td>3. <strong>Teacher fit</strong>: Determine how the learning material functions in relation to your teaching methods.</td>
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<tr>
<td>4. <strong>Learner fit</strong>: Determine how well the language level and content function for your students and whether and to what degree it corresponds to the course syllabus objectives.</td>
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<td>5. <strong>Implementation schemes.</strong> Determine whether the students can use the material efficiently, what previous knowledge is needed and whether can it be integrated directly into the curriculum?</td>
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<td>6. <strong>Appropriateness judgments.</strong> Decide whether or not to use the material based on considerations of for learners and teachers together with what is possible for the institution, keeping in mind that no material is perfect.</td>
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Hubbard (2006) argues that CALL material evaluation will become more common since the use of CALL-materials is increasing. For most teachers, CALL evaluation will stop at the judgment stage, but ideally, it should continue with empirical evidence for the evaluation. This can be a time demanding process. Thomas Robb and Bern Susser (2000) have investigated how language teachers choose their materials for classroom use. Results show that 78 percent of the teachers in this study used recommendations from other teachers when selecting materials. The reason for this is that teachers find colleagues a reliable source of information and that the pre-use evaluation process is very time-consuming. The teacher who knows everything does not exist, and neither does the evaluation procedure that covers everything. The framework presented by Hubbard can work as a first step for learning how to evaluate material in a systematic manner. According to Hubbard, the challenge for evaluators is to gain experience in the process to determine if CALL-material evaluation gives a reliable result.

Yet another framework for materials evaluation is provided by McDonough, Shaw, and Masuhara (2013). In their framework, which is the framework adopted in the current study, pedagogical materials are evaluated by conducting an external, internal and an overall evaluation process. McDonough, Shaw, and Masuhara argue that this model is useful because it is possible to conduct it in various contexts. The external evaluation is conducted to gain an overview of how the resource, or set of materials, is structured, and what it claims to achieve. During the beginning of the external evaluation, it is helpful to reflect on why the publisher has produced the material. Usually, the reason for developing an educational material is to fill a gap in the market that publisher intends to supply. While reading the content and the introduction, it is important to take note of what claims the publishers are making about the material that will be examined in more depth during the internal evaluation.

The internal evaluation allows for research on the micro level. The internal evaluation is a more in-depth evaluation of the resource. The critical part of the internal evaluation is to analyze the results of the external stage and look into whether or not the publisher/author lived up to his/her claims. According to McDonough, Shaw, and Masuhara (2013), the evaluator should look to determine whether the consistency and organization in the learning material are in agreement with what the external evaluation showed. McDonough, Shaw, and Masuhara argue that to do an active internal investigation, at least two aspects of material
should be evaluated. Hubbard (2011) thought that collecting empirical data was the most effective approach to evaluating material. Hubbard uses extensive criteria for evaluating material but rather vague since his criteria evaluate the structure and not pedagogical qualities.

McDonough, Shaw, and Masuhara (2013) identify several factors that are relevant to an internal evaluation. The first factor to investigate is how the learning process of the language skills functions in the material and how the material conducts them. The second factor is whether these language skills present themselves in a way that may conflict with what teachers set out to teach. It is important to investigate whether or not a grading process is implemented on to the tasks in the material since it is often not clear how the grading process functions in educational materials. The next factor to consider is how well the text material is suitable for learning when the material deals with reading skills, and there is a risk that the materials mostly have instructions focusing on developing students reading competence. If the focus mainly is on developing language skills, it will give less time and opportunities for students to learn and read an authentic material, which is a relevant factor in the internal evaluation. In the area of speaking it is important to investigate if recordings in the learning materials are authentic or constrained. Free speech is an essential part of speaking skills, and written dialogue does not encourage that. Tests and exercises should in every area have a “red thread”, in that exercises should prepare learners for the test. One question to ask is whether or not the resource or set of materials is flexible enough to be adapted to different learning styles, as teachers must often work with students who have different preferences about how to learn and develop their language skills. Learning materials of quality can be adjusted to suit the individual learner and allow him/her autonomy. The material can be integrated into the syllabus and teachers can use their knowledge of the learners to optimize the use of the material.

In the overall evaluation, the goal is to study how well the material integrates into the syllabus objectives and whether or not it is possible to generalize the results. It is good for the teacher to know whether or not sections of a learning material can be extracted or added to the material in Duolingo since teachers usually have an idea of how their learners develop most efficiently. If a resource or set of materials is flexible, it helps the teacher to integrate material to their pedagogy since teachers can refine the material to fit into the purpose of the lesson and the syllabus in English. McDonough, Shaw, and Masuhara also state that the ability to
evaluate materials for language learning is important to do as early as possible, ideally in a predictive pre-use stage where the evaluators find out as much as possible about the potential of the material.

3. The current study

In the current study, I conduct a material evaluation of Duolingo to examine how appropriate it is as an educational resource for the Swedish, English L2 upper-secondary classroom and to determine whether it can serve as a digital tool for knowledge acquisition, communication, and learning. To accomplish this, I follow the three-step evaluation methodology established by McDonough, Shaw, and Masuhara (2013), which comprises a pre-use external, an internal, and an overall evaluation. In addition, I use Hubbard’s (2006) framework in order to integrate a CALL-evaluation framework, as well as the pedagogical principles from Ellis (2005) and Tomlinson (2003b) to access the result with respect to language learning principles.

3.1 Method
3.1.1 Materials

The resource under investigation in this study is the language learning application Duolingo. Duolingo (2018-04-18) is a company working with language learning. Their learning platform can be used on smartphones, tablets, and computers through their app and website. Duolingo was launched in 2011 and has attracted more users every year. Duolingo aims to give people an opportunity to learn a language for free and make language learning more fun. On the platform, people can choose from several languages such as English, Arabic and many more. Duolingo’s users learn their chosen languages by using the platform 5-30 minutes per day depending on the desired pace of learning. According to Duolingo (2018), thirty-four hours of using Duolingo is equivalent to one semester. Duolingo has a special function for school purposes which allows the teacher to keep track of their students’ results and progress. The material used for this study is taken from Duolingo’s school version. The data from Duolingo for Schools will be the focus of the material evaluation to investigate and discuss whether Duolingo is a suitable language learning tool for school purposes.
3.2 Procedure

3.2.1 External evaluation

The external evaluation provides an overview of the material’s organization and helps to determine what content the educational product offers and what it aims to teach users. The external evaluation provides information to analyze the material. According to Tomlinson (2003a, pp 16), “it asks questions about what the materials contain, what the material aims to achieve and what ask learners to do.” McDonough, Shaw and, Masuhara (2013) find it useful to scan the table of contents since it often functions as a base in the external evaluation, how the material is presented and what claims are made about the content. The researcher should look up keywords or phrases that are used to see how other researchers interpret the word/phrase. Some other factors examined in the external stage are whether the material is intended to be supplementary or the core of a course. In other words, whether the material gives clear directions on how a teacher should use it or whether it can be used more freely (2013). After completing the external evaluation, the researcher, or teacher, can continue to use the findings in the group of learners the material is aimed toward and what purpose it can serve. Then the researcher can start the internal evaluation.

3.2.2 Internal evaluation

In the internal stage of this study, I have followed McDonough, Shaw, and Masuhara and looked at how Duolingo presents their language skill tasks, and what grading system Duolingo recommend. Chapelle (2001) chooses to include a judgmental perspective which includes some qualitative questions and focuses less on emphasizing the process and steps in the evaluation than in Hubbard’s study. The research questions of my study will provide a judgmental perspective to the evaluation process. I will research how flexible Duolingo for Schools is as learning material for students and whether or not it is possible to adopt the material to different learning styles. I include principles articulated by Tomlinson (2003b) and Ellis (2005) p to investigate the pedagogical quality of Duolingo for Schools.

3.2.3 Overall evaluation

After the external and internal evaluation, I conclude the investigation with an overall evaluation where I research the suitability of Duolingo as a digital tool for learning. The
parameters I am using are what McDonough, Shaw, and Masuhara (2013) describe as the usability factor, how Duolingo can be implemented for achieving the goals of the syllabus in Swedish upper-secondary school. The next factor considered is whether the core content in Duolingo can be applied for use with a larger group of students or not. I use Ellis’s (2005) principles to investigate if Duolingo functions as a pedagogical material. McDonough, Shaw, and Masuhara (2013) argue that it is good to know if materials for language learning can be extracted or added into the material in Duolingo for the teacher since teachers normally have an idea on how their learners develop more effectively. The last factor considered in the overall evaluation is the flexibility factor which is if the teacher can adapt the material to different learning-styles or parts of English education. If the material is flexible, it helps the teacher to integrate Duolingo to their education since teachers can refine the material to fit into the purpose of the lesson and the English syllabus. After all the criteria have been studied, it is possible to conclude what groups of students, and what part of the syllabus, Duolingo for Schools can help teachers and learners accomplish. It is important to remember, as Tomlinson (2003a) points out, it is not until the teacher has used a material in the classroom that teachers can know if it was successful or not. He argues that it is essential to do a post-evaluation as well although this step will not be included in this study due to size and length restrictions.

McMurry, et al. (2016) propose in their literary review of CALL frameworks for evaluation, that formal evaluation can help to fill the gap on issues that exist within CALL evaluation. Their research concludes that the field of CALL needs to be more aware of evaluation of traditional materials and make use of them when evaluating CALL material and activities. McMurry, et al. also states that it is important to be flexible with the framework the evaluators are using since frameworks might need to be adjusted to the evaluated material. Daniel Stufflebeam (1974) and Michael Scriven (1969) calls this a meta-evaluation of the researchers’ process: it provides a validation of the chosen evaluation and helps the researcher to have a clear procedure which leads to a more unbiased evaluation. A meta-evaluation will be included in the general discussion of the results to note what could have been done differently in the evaluation process.

4. Result and discussion
In this section, I present my general findings regarding Duolingo. The results are divided into three stages of evaluation: internal, external and overall. Each step concludes with a discussion and reflection on how appropriate Duolingo is as an educational resource for English upper-secondary school learning. Also considered is how well the program meets the directive of promoting digital tools for knowledge acquisition, communication and learning specified in the National Agency for Education’s curriculum.

4.1 External evaluation Duolingo

Duolingo’s stated goal is to create a personalized and fun education. Duolingo (2018) argue that everyone learns differently and that Duolingo can, with analysis, create and tailor a learning process which is personal for each student. On Duolingo’s front page on their website, Duolingo has a video presentation about the platform that states that thirty-four hours on Duolingo equals one semester at university. That statement is not in the same line ideas as Duolingo for Schools since Duolingo for Schools does not specify how many hours would equal a semester at university. The English version of Duolingo for Schools is a version of the learning platform designed for language learners who have no prior experience of the English language, students who can communicate using simple sentences or words and students who are looking to strengthen their existing skills. Duolingo is therefore divided into three levels: beginner, intermediate, and advanced. Duolingo for Schools has provided guidelines for how to use the platform in the classroom for educational purposes. Duolingo state that Duolingo for Schools functions most effectively as supplementary material to the existing materials in an English course. Duolingo for Schools can be used as the beginning of a class as a warm-up or at the end if students have finished the main task. Duolingo can function as an extra tool for students who struggle with a specific part of language learning and for students who lack motivation and need a different approach.

In the Duolingo Schools version, teachers are able to organize groups of students. The recommendation from Duolingo is creating groups of students in a class or in a specific course. The learning platform is available on smart-phones and tablets via an application and through computers via Duolingo for Schools website. Teachers can invite their students via email, and for students who do not have access to email, it is possible to create student accounts through the teacher’s account. By having students in this virtual classroom, teachers
have the opportunity to follow students’ progress and results in Duolingo’s tasks by providing a clear overview of the student’s activity. The table of content for Duolingo for Schools exists under three headlines, Assignments, English Curriculum and Class Activities. In Assignments, teachers can create assignments which focus on different areas of vocabulary and sentences, the teacher chooses the duration of the assignment and can include how many minutes per-day each student should work on a continuation task. The teacher can then follow their student’s results and progress after the assignment is created. Embedded in Duolingo’s curriculum are activities and exercises divided into the beginner, intermediate and advanced skill level. The teacher can browse here to find exercises in the area he or she is working with. In the class activities section, some exercises can be used in the classroom as material for group activities or practices that can generally be learned for the whole class. The exercises and assignments are given in clear directions and are predetermined, and they leave no room for the teacher to apply his or her knowledge to adapt tasks to their specific classroom.

Hubbard’s (2006) technical preview, which examines whether the material the teacher wishes to use, in this case, Duolingo for Schools, is suitable for the equipment that the institution has or that the students can use. Duolingo for Schools should be available to use for almost every institution in Sweden since digital tools required for Duolingo for Schools are standard in today’s education. Because of the accessibility, Duolingo for Schools fulfills Hubbard’s technical preview. Studies have shown that CALL-materials can be good for motivating students in language learning (Goméz Domingo and Badia Garganté 2015; Contreras, Charry and Castro 2016; Chapelle 2007; Hubbard 2009), and Duolingo for Schools qualify as such material. Even though Duolingo for Schools’ accessibility, Ellis (2005) argues that to become a good pedagogical tool for educational purposes it is important that the material focuses mainly on meaning, and that meaning often arises through interpersonal communication. By looking at the content and how Duolingo has organized their material it seems to lack opportunities for interpersonal communication due to that Duolingo work with individual exercises that focus on translation. Ellis discusses the importance of finding a good balance between formulaic expressions and rule-based competence in learning. Duolingo for Schools is more directed towards the rule-based competence focusing mostly on a grammatical form through syntactic language systems to develop student’s writing and listening of sentences. The goals of the National Agency for Education (2011) state that every student should be able to use digital tools for knowledge acquisition, communication and learning are not fulfilled with Duolingo for Schools. Duolingo for Schools provides the opportunity to develop
knowledge acquisition and learning within syntactic written and listening skills, focusing on grammar and vocabulary. However, it is never stated in Duolingo for Schools that it should be a central part of the course material. It should be used as a supplement in a language course. The platform seems to work well as a way to organize students and classes, and teachers can easily get an overview of the progress of the students in the classroom. Hubbard (2006) emphasizes the importance of being able to adjust teachers learning materials to the specific learners and classroom, which is a shortcoming of Duolingo for Schools, since most of its material is predetermined, and if a teacher needs to practice other parts of language learning, other materials will be needed.

4.2 Internal evaluation Duolingo

Duolingo for Schools is consistent in how it organizes its curriculum and application usage since it proceeds in three steps. The difficulty and skill level develops throughout the process of completing exercises. The level of the exercises in Duolingo for Schools increases step by step. The first exercise starts off with basic vocabulary or sentences to more advanced grammar and vocabulary. The exercises in Duolingo for Schools mainly focus on developing grammatical knowledge within syntactic writing and listening with translation tasks. The increasing difficulty level functions the same whether students are working at the basic, intermediate or advanced levels.

The exercises in Duolingo for Schools strive to develop students’ knowledge of language systems within vocabulary and grammar. To help them achieve proficiency, the platform works with three kinds of exercises with some small variation to them. The focus is on writing and listening, and the goal is to produce correct sentences or use correct vocabulary to develop students’ written and listening skills. Duolingo works with syntactic language systems to develop student’s writing and listening of sentences. Exercise one is a reverse translation task, where students read a sentence or a word in their native language and translate it into the language learned. This exercise is focusing on finding the right translation and pointing out the different syntactic elements e.g. verbs, adjectives, and adverbs in a sentence. The second exercise is similar, but with more support for the student. The student translates and constructs sentences from a bank of words in the second exercise. The third exercise is a listening exercise where students are to transcribe a phrase which the students
listen to. Some translations can provide multiple answers which can be correct because of synonyms and homophones. Therefore, Duolingo for Schools aligns student answers with the similar correct answer to give feedback to the students. If a student’s answer is incorrect, there is no chance to correct it, and students move on to the next task. Duolingo collects data from students’ results and can see if a student is struggling with a specific part of speech or certain grammatical features. The data from the results can be useful to work with student’s built-in syllabus so that teachers can direct help towards where it is needed the most.

Duolingo works with written dialogue in every exercise. It is possible to communicate with users in the community during the exercises. Students can click on a link to a forum on a sentence in an exercise, where they can ask questions about a sentence the students did not understand or to view other students’ answers or questions. There is no grading system in Duolingo for Schools, nor are the exercises and assignments aligned with the knowledge requirements specified in the English syllabus of the Swedish curriculum for the upper-secondary School. Finished assignments and exercises give the students experience points or "Lingots", that is supposed to work as motivators in that students can compare their experience and unlock achievements with their "Lingots."

A more in-depth look at the pedagogical qualities of Duolingo for Schools using Ellis’ (2005) principles for good pedagogical learning materials reveals that Duolingo fulfills parts of the principles but is lacking most of them. One principle from Ellis that can be achieved with Duolingo for Schools is that learners focus on form, which Ellis finds necessary for developing within a language. He writes that teachers can focus on form in a number of ways, e.g. through grammar lessons working with specific features of grammar, or with focused tasks working with grammatical structure. This principle from Ellis is very similar to how Duolingo organizes itself since the tasks are predetermined with a clear goal of developing grammatical knowledge within syntactic writing and listening. These features of Duolingo can be linked to Vandergriff’s (2016) description of an audio-lingual method for learning. The learners in Duolingo has little control over how to learn since the learning pattern is already set. Exercises in Duolingo for Schools also take to some extent account of the learner’s built-in syllabus, which is also a principle form Ellis. Teachers can use the information of their students’ results to work with specific goals that target the students’ built-in syllabus. Even if Duolingo for Schools is working with these principles, there are still a lot of missed opportunities to work with authentic material creating meaning if teachers solely would use
Duolingo for Schools. The essential principles of language learning from Ellis (2005) that Duolingo for Schools are missing are: working with authentic material and meaning which Ellis believes is important for the learning process. Tomlinson (2003b) agrees on that authentic material is important and that it provides opportunities for rich input that varies from planned to unplanned conversations. Ellis (2005) argues that the opportunity to communicate in the target language is vital for creating an environment where learners get both input and output creating interpersonal communication. The exercises in Duolingo for Schools have few opportunities for students to focus on learning since there is not a lot of information on e.g. grammatical rules which are needed for the exercises. Duolingo for Schools does not provide any space between the exercises for developing student’s grammar or vocabulary. The commutation feature at Duolingo for Schools is in my opinion not very useful. The opportunity to ask questions at their forum does not ensure a direct answer which is a criterion for interpersonal interaction and creating input and output.

Judging how well Duolingo for Schools function to motivate both learners and teachers can be difficult since every classroom and teacher is unique. However, by looking at the previous studies of CALL-materials (Goméz Domingo and Badia Garganté 2015; Contreras, Charry and Castro 2016; Chapelle 2007; Hubbard 2009) Duolingo qualify as a CALL-material which should help to motivate learners according to these studies. The usage of experience points and "Lingots" as motivational features links to modern games which is a common interest among the “digital natives”. How the teacher views Duolingo for Schools is difficult to know, however Bradin (1999) states that language teachers might perceive CALL-materials very differently than their students which can be good to take into account.

After the internal evaluation, it is apparent that Duolingo for Schools is not suitable for following the specific requirements of the directive from the National Agency for Education (2011) regarding promoting digital tools for communication. Duolingo for Schools does not give students any possibility to interact with each other. Therefore, there is none authentic input or output creating interpersonal communication for the students. Duolingo for Schools can be used for knowledge acquisition and learning if teachers use the platform for developing student’s grammatical knowledge within syntactic writing and listening. The result shows that students who wish to develop grammatical knowledge and vocabulary can achieve that with Duolingo. Duolingo can, in my opinion, still function well as a supplement to a core material that is more directed towards other parts of language learning than grammar
and vocabulary such as speaking, reading, and creative writing. There is not enough breadth or variety of exercises within Duolingo for teachers to rely solely upon this single platform. The language teaching would be very one-sided learning since Duolingo for Schools only uses grammar-translation method for language teaching. However, research shows that motivation is a big part of whether students engage in learning, and CALL-materials can help achieve that. Therefore, I believe that Duolingo still can be useful in today’s L2 language education.

In the overall evaluation, I will use the results from the external and internal evaluation to consider whether or not the core content in Duolingo can be generalized and therefore, useful for a larger group of students. I will also examine the syllabus in English upper-secondary school to analyze if the content in Duolingo for Schools fulfills any of the syllabus objectives.

4.3 Overall evaluation Duolingo

One important consideration raised by McDonough, Shaw, and Masuhara (2013) is whether the teaching materials in question can be generalized to a larger group of students or if the material functions better for specific individuals. One feature of the tasks in Duolingo that makes them potentially useful for a larger group of students is that it is possible to decide what level of difficulty each individual student should be working on. The teacher can also use information about students results to plan a lesson in accordance with what skills their students need to develop. However, the tasks are very one-sided and do not offer a lot of variety. If students are in need of a different learning method than grammar-translation, it would be up to the teacher to do a professional and pedagogical choice of using another learning material. The limitations of pedagogical approaches are another example of lack of flexibility in Duolingo for Schools.

The content of Duolingo can be difficult to integrate into the syllabus in English at upper-secondary school and it is difficult to know whether it can be useful or not. The National Agency for Education specifies five overall goals in the English syllabus for upper-secondary school (Skolverket, 2011). Out of those five, Duolingo provides material which lends itself to one of them, the ability to understand spoken and written and interpret content in English. Because the material in Duolingo for Schools focuses mainly on grammatical knowledge
within syntactic writing and listening on how to structure sentences. Trying to achieve the other four goals from the National Agency for Education will be a problem. Skolverket aims to develop students’ linguistic strategies in different situations and using English in varied contexts adapted to the recipient. Students should be able to discuss and reflect on social and cultural phenomena in countries where the population speaks English. Duolingo for Schools develops grammatical knowledge within syntactic writing and listening with mostly translation tasks. It is possible to argue that grammatical knowledge within syntactic writing and listening develops students general learning and English skills. That will give students the opportunity to achieve e.g. the goal of being able to formulate and communicate in written and spoken English in the syllabus. It is most likely the teacher’s choice on how to use and interpret Duolingo for Schools where teachers find it to be the most useful.

Hubbard’s (2006) framework, helps to investigate if the material in Duolingo for Schools is Learner Fit or Teacher Fit. The freedom teachers have on when, or if to use Duolingo for Schools, suggest that it is Teacher Fit since teachers can use Duolingo for Schools where he or she believes it to be most effective. To determine how well Duolingo for Schools is Learner Fit depends on the language level of the students, and if the content is within the student’s built-in syllabus. Another factor is whether or not the content corresponds with the course syllabus objectives. Duolingo is not flexible and uses audio-lingual methods for learning to some extent. The tasks in Duolingo for Schools focus on accuracy and are predetermined with human-computer interaction. It is up to the teacher’s knowledge of their class to choose the exercises and level that is suited for the learners and the objectives he or she aims to achieve. The language level is easier to adjust since teachers can choose the level of an assignment or exercise individually from student to student. I believe that the content will be the greatest challenge because it is very one-sided working with translation based exercises and assignments that focus on grammar and vocabulary to build sentences. Hubbard discusses the effects of limited variety in his step implementation schemes in his framework regarding whether the students can use the materials effectively. Is previous knowledge needed or can it be integrated directly into the curriculum? Students’ prior knowledge going into upper-secondary school can vary, but because the teacher can choose the level of difficulty in Duolingo for Schools, this should not be too problematic. The problem is integrating Duolingo into the syllabus for the English subject in the Swedish curriculum. Duolingo for Schools does not help learners work towards a lot of the objectives that upper-secondary school English aims to achieve. None of the exercises specifically target
interpersonal communication, rhetorical strategies using English for different purposes, recipients or situations. Duolingo for Schools only helps to develop grammatical knowledge within syntactic writing and listening. Therefore, it can be difficult to integrate the content of Duolingo for Schools to the subject of English in upper-secondary school.

5. Conclusion

Duolingo clearly sets out to create a personalized and fun educational platform. Duolingo state that the materials intention is to be used as a supplement to core course material. The external evaluation showed that Duolingo for Schools can help to organize groups of students according to developmental needs to help teachers follow their progress and results as students use the platform. The content is clear and divided into three categories: assignments, English curriculum, and class activities. The teacher can also choose to work at beginner, intermediate and advanced level. Duolingo for Schools is very accessible for educational institutions and serves the function of a digital tool which can enhance language learning. The internal evaluation revealed that Duolingo for Schools exercises and assignments focus on grammar and vocabulary to build sentences. The tasks come in a progression of three levels that focus on translation using a grammar-translation method for language teaching. The dialogue is written, and the tasks are predetermined which makes the material less flexible. There is no grading system, and students only earn points and “Lingots” as he or she uses Duolingo for Schools. The goals of using digital tools for knowledge acquisition and learning can be fulfilled depending on how teachers want to use Duolingo for Schools. The results show that if students want to develop their syntactic written and listening skills, focusing on grammar and vocabulary Duolingo can help to achieve that.

The overall evaluation showed that Duolingo for Schools can be difficult to integrate into the English subject in upper-secondary school English. The content of Duolingo does not achieve most of the objectives in the syllabus, and it does not support many of the communication, linguistic strategies and social goals in the syllabus. However, it would be difficult to find a resource that contains every element in the syllabus. Duolingo for Schools’ main limitation is the element of interpersonal communication. Duolingo can serve the purpose of developing syntactical sentence-level writing and listening skills and as a tool for general vocabulary learning. Duolingo for Schools can be generalized for a larger group of students since it is
possible to choose the level of difficulty and CALL-materials can help motivate learners, although the content can be very one-sided and does not offer much variety.

The appropriateness of Duolingo for Schools as an educational resource for English upper-secondary school learning depends on whether teachers use it as a main or supplementary material. It does not accomplish most of the objectives in the English syllabus and does not provide a large range of tasks. Therefore, Duolingo for Schools can be a good educational material resource if teachers use it as a supplementary source that can help students with the learning process in specific areas of listening and syntactic sentence-level writing. Duolingo for Schools can also encourage students in the learning process being a CALL-material that can increase a learner’s motivation and engagement. The directives from the National Agency for Education of promoting digital tools for knowledge acquisition, communication and learning are not solely fulfilled with Duolingo. It is possible to argue that it helps to increase students’ knowledge acquisition learning since Duolingo for Schools is a platform that features exercises and assignments striving to develop a learner’s language skills. The results show that Duolingo for Schools can be a good educational material resource if teachers use it as a supplementary source that can help students with the learning process in specific areas of listening and syntactic sentence-level writing. The aspect of language learning that I am missing is that the promotion of interpersonal communication is close to zero, therefore Duolingo for Schools is not a digital tool for increasing students’ communicative ability.

Even though research has shown that CALL-materials can help to increase student’s engagement and motivation in our digitized society, it is still essential to do a materials evaluation. My evaluation of Duolingo for Schools shows that it could function well as supplementary course material in the areas of listening and syntactic sentence-level writing and listening focusing on grammar. The problem is that the objectives of the National Agency for Education (Skolverket, 2011) are a lot more extensive than what Duolingo for Schools can provide. One factor that is interesting in research regarding CALL-materials from Chapelle (2001, 2007, 2010), Tomlinson (2003a 2003b) or Levy (1997) is their view of digital tools. When researchers can compare old digital tools for language learning to Duolingo for Schools, it is easy to say that the technological development has gone quickly. Even though Duolingo for Schools is not a complete resource as a digital tool for language learning, it can still serve the purpose of learning better than a CD or a video in my opinion. Duolingo for Schools shows potential by being able to have a whole language platform on a website or a
mobile app. Hopefully, with some further development, more language learning than listening and syntactic sentence-level writing and listening focusing on grammar can be implemented into these platforms. I believe that Duolingo for Schools is far more useful than old digital tools since students are in more control over the process of learning, it provides a more interactive platform that students can use themselves and work with individually. One example is that teachers do not have to give the same instructions to every student or have them to listen to the same audio file while working with listening. I believe the more teachers work with platforms such as Duolingo or similar materials, the more teachers will find them useful. Hubbard (2006) states a problem for teachers, that teachers often have limited their experience working with CALL-materials. Materials that are traditionally used might not be appealing to the students who are likely to have a lot of experience using modern digital tools. It is important for teachers to be open to try new materials which even their students might be more familiar with. Ideally, it is best if teachers are able to evaluate the new material before using it in the classroom. By conducting an evaluation process teachers can ensure materials quality. I believe it is still better to use a proven qualitative material rather than digital tools that have not been evaluated.

What I find questionable is that Duolingo at their website states that thirty-four hours of using Duolingo equals one semester at university. I have not found any research that would justify that correlation, and when the research goes in further on to Duolingo for Schools’ platform, Duolingo for Schools write that it should be used supplementary. Firstly, claiming that Duolingo would equal a semester at a university for private users is a strong statement, which is hard to believe. The results of my evaluation support my belief since Duolingo for Schools only covers a small area of language learning compared to the content with the National Agency (2011) goals or Ellis’s (2005) principles. Duolingo for Schools most significant limitation is the element of interpersonal communication. Communication is also a goal itself in the National Agency wanting to increase digital competence using digital tools for interpersonal communication. Several of Ellis’s principles as well are directed towards some sort of interpersonal communication where creating opportunities for output and input among students is important to create meaningful learning. I find Duolingo’s platform well organized since teachers can divide students into groups and are able to follow student’s progress easily. The problem is, as I have stated, that the content and learning method is too one-sided, hence the limitations in the interpersonal communication elements and that Duolingo solely uses grammar-translation exercises. It will leave a lot of responsibility to the teacher to make sure
that other parts of language learning are covered by materials which are not Duolingo for School.

To summarize, this study aims to study whether or not the CALL-material Duolingo is appropriate as a pedagogical language tool for upper-secondary school English learning, and how well it meets the directive of promoting digital tools for knowledge acquisition, communication, and learning. By doing a materials evaluation on Duolingo in three steps--external, internal and an overall—the evaluation allowed for a result. The findings in the evaluation suggest that Duolingo is not appropriate as a core-material for upper-secondary school English learning because of its limitations in what areas of language it covers. Duolingo for Schools can serve as a supplementary material to cover grammatical knowledge within syntactic writing and listening. Duolingo does not meet the directive of promoting digital tools for interpersonal communication since the platform only work with grammar-translation as the learning method and that does not include any interpersonal communication. However, it can function as a digital tool for knowledge acquisition and learning within the areas of syntactical grammar knowledge in writing and listening skills.

The primary reason for conducting this study was the growing market of CALL-materials together with the increasing promotion of digital tool for educational purposes that was featured in the National Agency for Education. This study investigates if the leading CALL-materials in users also is a qualitative material for teaching. With growing options for choosing language learning material, it is important to evaluate how well these can function in the educational environment. The result also suggests the importance of evaluating materials before using them in teaching. That is for all kinds of material, although the evaluating process is even more important while working with new digital tools since research and usage of digital tools is not as usual as traditional materials. We can conclude that Duolingo for Schools has not gained its popularity from its content or varied learning methods. I believe it is how Duolingo for Schools is organized, and how user-friendly the platform is. What was surprising in the findings of this study was how one-sided the learning material in Duolingo is since it promotes itself as a learning platform that can increase user’s language skills in general to a large extent. The areas of language that I find in this research is that Duolingo for Schools mainly focuses on developing grammatical knowledge within syntactic writing and listening with grammar-translation tasks.
References


Skolverket (2011) *Få syn på digitaliseringen på gymnasial nivå – ett kommentarmaterial för gymnasieskolan, gymnasiesärskolan samt Komvux och särvux på gymnasial nivå*


