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# BACHELOR THESIS

HOW DOES ASSESSMENT FOR LEARNING UNDERPIN  
PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM  
OF EDUCATIONAL APPLICATIONS, BE USED FOR  
ADDITIONAL SUPPORT?

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HOW DOES ASSESSMENT FOR LEARNING UNDERPIN PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM OF EDUCATIONAL APPLICATIONS, BE USED FOR ADDITIONAL SUPPORT?

## Abstract

A final research product for the International Teacher Education Course at NHL Stenden University of Applied Sciences, this is an investigation into the Assessment for Learning (AfL) practices of a small international school in southern Germany as well as possibilities to support AfL and student agency with educational applications. For this project, the researcher questioned Elementary school homeroom teachers of the aforementioned international school about their approaches to AfL and student agency in general as well as their use of ICT (information and communications technology) in this specific context. Furthermore, she trialed the learning management app SELAS (Smart Education Learning Analytics System) (Hanf, 2019), that was developed as part of the German initiative for improved integration of ICT into daily classroom practices and compared her findings with the feedback from German primary school teachers that have been using the app for formative assessment as well as management purposes for the past academic year. In her findings, the researcher concluded that with students displaying an increased natural proficiency in the overall use of technology (Chiong & Shuler, 2010), the correct use of educational applications can be highly beneficial for student agency, foster self-assessment and self-management skills in students and thus positively add to AfL in the twenty-first-century classroom.

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## Rationale

### Introduction

*"With resources available so readily through advancements in technology, giving students the power over their educational journey seems more plausible than ever" (Zimmer, 2016).*

The modern-day teacher is more than just an educator, they are also a manager, an assessor, and a motivator. The role of the student has changed over the years, too, from being a passive observer to being an active contributor to their own learning and assessment. Assessment especially takes a lot of time and effort in order to be purposeful and beneficial for both the teacher and their students. Nevertheless, it is crucial for teachers to "understand how students learn to help [...] facilitate [their] further learning" (Murchan & Shiel, 2017, p. 44). The one method for assessment that was proven to be most valuable for student progress is Assessment for Learning (AfL), whereby assessment is not used to mark or rank students' performance summatively but rather to document their progress and thus help to optimize their learning (Muijs & Reynolds, 2011). A summative form of assessment would thus be an assessment of learning at the very end of the learning progress, informing mostly the teacher about what the student has learned. A formative form of assessment such as AfL, however, is carried out while the student is acquiring new knowledge and is therefore beneficial for both the learner and the instructor as it provides insight into the learner's development. Using AfL, the children are not only aware of their current state of knowledge, they can also identify the reason why they are at their current level as well as the steps they need to take in order to progress (Cambridge Assessment International Education, 2017). Through the self-reflective processes that AfL is based upon, it creates a lot of opportunities for student agency which has been proven to promote intrinsic motivation and thus help students' progress (Biggs & Collis, 1989). Self-

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reflection, however, is something that students have to be taught before it can be an effective tool in the classroom and for many children, especially younger ones, this can be difficult (Hawe & Dixon, 2016). Recently, educators and curriculum developers have been striving towards an improved integration of technology, specifically ICT and educational applications, into the everyday school life (Breiter, Stolpmann, & Zeising, 2015). For the researcher this new development, especially in German national schools, was a reason to wonder whether an improved integration of ICT into assessment processes could possibly facilitate student agency and self-reflection by providing them with options to do so in either a more playful way or even with input from the learning applications that were being used in the classroom.

### Objectives

During this project, the researcher took a closer look at the history of AfL in education in general as well as its correlation to ICT. Furthermore, in the field research part of this project, the researcher examined her teaching practice (TP) school's practices regarding AfL in general; how teachers and students worked together to improve instruction and learning processes as well as how these processes were being supported using ICT. During the researcher's final teaching practice placement, there was a case study with a test group of students trialing a new educational application that was developed as part of the German ministry of education's initiative for a better integration of technology into the classroom and seemed as though it could possibly facilitate the analysis of student progress and therefore formative assessment processes (Breiter, Stolpmann, & Zeising, 2015). The researcher analyzed her TP school's current assessment practices with regard to AfL and questioned the teachers of the Elementary department about their experiences with these practices. Furthermore, she collected data from German national schools that were trialing the education application that she had used with a group of third graders at the TP school.

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All data gathered from these three processes were then compared to one another as well as to existing theory regarding AfL and the integration of ICT. As the results of the research are based on a very particular environment and one specific educational application, the main purpose for it is to inform the researcher and her own assessment practices. However, most of the findings can be projected onto a general approach to using ICT to support AfL and so this paper could serve as a guide for schools that are looking for new ways to support their AfL through educational applications.

### Motivation

As a twenty-first-century teacher, it is inevitable that one must stay up-to-date with the technological advances made concerning education. These can be everyday things such as the Smart Boards that replaced regular black or whiteboards. However, these advances also describe developments made in learning tools. Modern elementary teachers especially have been provided with many technological opportunities to support their teaching, be that in the form of reading databases or interactive mathematics websites. Many of these advances are made concerning the use ICT in all aspects of the profession, but particularly in the areas of class and classroom management as well as the monitoring of pupil progress (Dunn, 2012). Depending on their educational background as well as preferred teaching practices, not all teachers are knowledgeable about the new possibilities provided by technology. It is, however, crucial for teachers in this technologically developed era to be knowledgeable in the use of especially ICT, in order to be able to facilitate not only their students' learning but also their own management thereof. The main motivation behind this project is therefore to enhance the researcher's own understanding of both ICT and AfL as well as a combination of the two. The objective is to become a better teacher overall as well as to critically examine new developments in the realm of ICT classroom management support.

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## Research questions

### *Main question*

How does Assessment for Learning underpin pupils' progress and how can ICT, in the form of educational applications, be used for additional support?

### *Sub-questions*

- What is assessment for learning? Advantages and disadvantages
- What possibilities are there to support assessment for learning with ICT?
- How has the use of ICT regarding assessment for learning changed over the years?
- Educational apps – the future of assessment for learning?

- 
- How does school x make use of ICT to support assessment for learning?
  - How does the application SELAS support assessment for learning and how could school x benefit from using it?

## Significance

“The march of information and communications technology is fast and unrelenting” (Price, 2009, p. 1). ICT makes up a big part of human life these days and its influence is ever-increasing. Teachers who can leverage this to their advantage, could possibly majorly facilitate their lives as class- and learning managers (Breiter, Stolpmann, & Zeising, 2015). At the same time, Assessment for Learning should play a central role in the management of pupil progress. “Students should be fully engaged with their learning, contributing to the planning and organization of lessons [...] assessing their learning and that of their peers and benefitting from individualized support and differentiated learning” (Murchan & Shiel,



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2017, p. 56). Yet, it can be time-consuming for the students to go through the self-reflective processes needed to coordinate their further course of action (Swaffield, 2011). To be able to combine assessment for learning with ICT could possibly be highly beneficial for the way the teachers manage their students' learning progress as well as the way students self-manage them.

## Literature Review

The theoretical background for Assessment for Learning is vast and well-researched. Researchers have been stressing its benefits for both the teacher's management of pupil progress as well as for the students' development itself (Grigg, 2015). This literature review aims at answering the first four sub-questions of this research project and through that shed some light on the use of AfL in schools, its advantages and disadvantages as well as whether there already are any means to support AfL through ICT. Furthermore, it investigates how the connection between these two fields has evolved over the years. Finally, the researcher will also review literature on educational applications such as the one used in the case study that is to be part of the field research.

### *What is assessment for learning? Advantages and disadvantages*

AfL is a form of formative assessment that was made popular in the 1990s by researchers Paul Black and Dylan Wiliam in their book *Inside the Black Box: Raising standards through classroom assessment* (1998). When the practice emerged, educators around the world felt as though learners were being over-assessed and tested in order to rank them or make comparisons between them (Cambridge Assessment International Education, 2017) and this is, without doubt, still an issue today as AfL in no way fully replaced summative forms of assessment. The form of assessment that was being used at the time is commonly known as Assessment of Learning and has been the predominant practice in education for centuries before the emergence of AfL. Effectively, Assessment for and Assessment of Learning are simply two contrasting aspects of the overall assessment of pupil achievement and progress. While AfL is an aspect of formative assessment; an assessment that is to be carried out during the learning process in order to provide intel into the learning progress and inform further action. Assessment of Learning is also known by the name of summative

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assessment and usually happens at the end of a learning cycle thus testing what knowledge has been acquired and retained. Dixson and Worrell (2016) define the two as follows: "Formative assessment involves gathering data for improving student learning, whereas summative assessment uses data to assess about how much a student knows or has retained at the completion of a learning sequence" (p. 153). The aim of formative assessment is to inform teachers and learners about the learners' progress and provide feedback that can be used to help the students learn more effectively. Summative assessment intends to capture what a student has learned during a learning cycle and judge their performance against a certain set of standards, thus providing the teacher with an overview of how much learning has taken place.

To be able to research the topic, one needs to first define the term of AfL before looking into the subject further; Carroll and McCulloch (2014) define it as "the process in which teachers, learners or their peers elicit, interpret and use evidence about pupil achievement to make decisions about the next steps" (p. 166). They state further, that it comprises a sequence of three recurring activities: stimulating the learners to think about the topic, the learning goal and criteria for success; finding out what and how they are thinking; and identifying next steps for better, more effective thinking. To achieve optimal results with AfL, both the students and the teacher should work together as a community of learners (Davidson & Carber, 2012).

That being said, Assessment for Learning consists of equal parts of peer, self and teacher assessment. Students are encouraged to reflect on their own learning processes and progress, and on basis of that shape their own learning trajectory. Through AfL, the focus of assessment in the classroom has been shifted from an "activity which is 'done to' children to one which is done with children" (Hansen, 2012, p. 191). Due to that, many

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researchers have called for formative assessment to be looked at as “‘assessment for development’ rather than just ‘for learning’” (Carroll & McCulloch, 2014, p. 167). Nowadays, a new trend, very similar to AfL has emerged and has played a central role in the recent revision of the IB Primary Years Program (PYP): Student agency. While student agency is basically the same as AfL, it extends further into everyday classroom processes such as the physical setup of the learning space (International Baccalaureate Organization, 2019).

### *Advantages*

AfL significantly impacts on the learning process itself by making the learning criteria visible and therefore more accessible to the students; in short, it visualizes the aim of learning. Through constant reflection as well as feedback, the students get a deeper understanding of what they are learning and why they are doing so, which can have positive effects on learner motivation and autonomy. On that, Carroll and McCulloch (2014) state that, intellectual challenge, thinking and collaborative working are key factors in the ongoing process of developing independent learning. Research has found that, when AfL is used over extended periods of time, this can support students to become confident, reflective, innovative and engaged (Swaffield, 2011). Especially for lower-attaining students, AfL has been found to be a major means of raising standards (Grigg, 2015).

“As youth learn to accurately assess their strengths and limitations, they develop the confidence and optimism that leads to a growth mindset, studies show. And they begin to understand that success depends on the willingness to risk failure, get feedback, and keep trying” (Cushman & Baron, 2017).

Conversely, not only the students can benefit from using AfL; teachers can use it to adapt their teaching strategies according to the results of assessment as well as feedback they

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receive from their students and thus create a more fruitful learning environment (Cambridge Assessment International Education, 2017). Because of its benefits for the teaching practice, formative assessment is also at the heart of the PYP approach to assessment as it “provides feedback to teachers as they monitor and adjust their teaching strategies” (Davidson & Carber, 2012, p. 60). The aforementioned PYP or Primary Years Program is an Elementary or Primary School curriculum developed specifically by the International Baccalaureate Organization and will be explained in greater detail later in this thesis. Due to its focus on inquiry-based learning, it provides teachers and learners with plenty of opportunities for AfL as well as student agency in general (International Baccalaureate Organization, 2019).

### *Disadvantages*

“Despite the widespread endorsement of AfL, in practice there have been mixed reports on how well teachers have implemented the recommended strategies. One of the explanations has been that teachers have been too pressurized to improve students’ results in externally set tests and examinations to fully implement AfL strategies” (Grigg, 2015, p. 409).

Teachers reported challenges such as the demands of marking, time pressure, increased noise levels in classroom activities and the difficulties of implementing AfL across the curriculum. Even though educators have been acknowledging that “[w]hen students are acquiring new knowledge, skills, concepts and even attitudes, they need opportunities to practice these without consequences in terms of their grades” (Davidson & Carber, 2012, p. 52). Many of the other stakeholders in the schools are calling for a way to measure and rank student achievement and for now, grading is the predominant way to do so. Furthermore, many teachers know the terms but do not understand or follow the underlying principles (Atjonen, 2014). Due to that, the effect or simply put the benefits of AfL still remain minimal because of a lack of effective review of learning in class alongside a lack of opportunities for peer- and self-assessment.

### *What possibilities are there to support assessment for learning with ICT?*

Before one can take a closer look at the specifics of AfL support through ICT, one needs to first look at the overall benefits of incorporating ICT into the everyday learning processes

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in school. Using technology in class has become common practice over the past decade, especially in international schools (Price, 2009). While using ICT on a regular basis can seem intimidating especially when one has not had specific training for it (Breiter et al., 2015), it is important to keep in mind that “for children, especially those of primary school age, there is nothing ‘new’ about technology” (Moyles, Georgeson, & Payler, 2011, p. 168). Moyles et al. (2011) stress the importance of teachers cultivating a “positive ethos” around the use of digital technology in the classroom, which recognizes the ways in which developments in technological landscape influences how children learn today, as well as the concept of their learning. Research specifically conducted for the IB PYP has found that “[t]here are few educational issues with so much unfulfilled potential over the past 15-plus years as the role of technology in the classroom” (Davidson & Carber, 2012, p. 90). However, the PYP already recognizes ICT as no particular subject area but rather a tool to facilitate learning throughout the curriculum. As that, the curriculum guidelines encourage teachers to make use of technological advances to facilitate their teaching as well as assessment. Davidson & Carber (2012) state that, “[t]echnology can be viewed as a performance task enabler when viewed within the context of demonstrating student understanding” (p.94) and can, therefore, serve as a tool for assessment of student progress. It can furthermore play an important role in monitoring progress during lessons by providing students with opportunities to show their understanding as well as use their experience during self-reflection to identify skills they still need to develop or practice. Through that, it ties very well into the scheme of Assessment for Learning (Moyles et al., 2011). It is crucial to acknowledge the significance of technology’s potential to support key ideas and skills within the learning process (Davidson & Carber, 2012), ICT must thus serve as something larger than itself. Davidson and Carber found that as of now, the incorporation of ICT in schools has yet to reach its full potential and for that “[t]he PYP structures of curriculum

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development and documentation must provide entry points for the authentic use of technology" (p.99). It is, however, commonly acknowledged by now that, e-tools, such as learning apps and reading databases, are effective when used in combination with assessment approaches that enhance students' self-assessment and self-regulated learning such as AfL as they provide valuable feedback about student progress which the learners can use to identify their strengths and weaknesses and thus plan their further action (Nicol & Milligan, 2006). More and more schools are therefore beginning to rely on e-tools like *SeeSaw* (2013) as a form of e-portfolio where students can contribute to the documentation of their own learning and thus take ownership of it.

### *How has the use of ICT regarding assessment for learning changed over the years?*

"The use of technology to support assessment practices has a long history" (Nicol & Milligan, 2006, p. 11). However, as Davidson & Carber (2012) stated, the influence of technology on teaching in general has also been grossly overlooked by educators for the better part of the last two decades. For that reason, also, the use of ICT as support for Assessment for Learning is a field that few have researched yet. Because many teachers are still reluctant to incorporate ICT into their teaching at all (Breiter et al., 2015), it is challenging to provide recommendations for how teachers should be using digital technology specifically within the primary classroom (Moyle et al., 2011). Before the emergence of social platforms like *Google classroom* (2014) and educational applications such as *SeeSaw*, teachers had little to no opportunity to use ICT for assessment at all. Even today, many are still reluctant to do so and many schools, especially those in less affluent areas do not in fact have the technological means to use ICT on a regular basis at all (Pollard, 2014). In Germany in particular, there still are a number of national schools, that do not use any technology outside of the mandatory ICT classes. It has been argued that "the ways

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in which computers impact upon children's lives is dependent on the individual social structures in place within the children's homes [and therefore] teachers cannot assume that all children develop digital skills similar to one another" (Moyles et al., 2011, p.169).

### *Educational applications – the future of assessment for learning?*

Educational applications or learning apps provide teachers as well as students with opportunities to acquire new skills, practice already learned ones and reflect on their progress (Chiong & Shuler, 2010). They can, unlike older versions of learning technology, also be used on mobile devices which makes them more accessible even in settings where students do not own or have access to laptops. As Chiong & Shuler (2010) state: "Mobile devices present a unique opportunity that previous educational technologies have not" (p.26).

In these fast-paced, digital times, it would be tempting to answer the above question affirmatively. The reality, however, is that there are huge discrepancies in society when it comes to the ability to effectively use technology and media for learning. While most children are to be characterized as so-called digital natives (Chiong & Shuler, 2010), "some children will need to be actively taught how to use certain aspects of digital technology and be encouraged to develop particular digital skills" (Moyles et al., 2011, p.169). Conversely, research has found that because of the numerous benefits of self-regulated learning and self-assessment that can be supported in an online context, educational applications are a good way forward (Clarke, Timperly, & Hattie, 2001). The most common practice to guide and monitor these processes "is to create and administer online objective tests and quizzes that can be used by students to assess their understanding of a topic or area of study" (Nicol & Milligan, 2006). Applications like SELAS that create opportunities for students and



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teachers to work with such quizzes during the formative assessment can therefore be very beneficial for the process of AfL.

### *Student agency and the IB PYP*

Big parts of this research project are based upon a specific curriculum and its approach to AfL and therefore it has to be outlined before investigating it further; The context of this research is the so-called IB Primary Years Program, an inquiry-based curriculum designed specifically to cater to the needs of international students aged four to twelve (International Baccalaureate Organization, 2019). The IB learner profile is quite specific about the fact that learners should be actively engaged in their own learning and the co-construction of their learning goals (International Baccalaureate Organization, 2018). Learning is therefore mainly based on blocks of student-led inquiry, the so-called Units of Inquiry. During one school year, there are usually six of these, with two Units per term. These units aim to help students make sense of the world around them by letting them inquire into a certain Central idea and explore its history, the science belying it as well as societal issues related to it. At the base of all this lies a “structured, purposeful inquiry that engages students actively in their own learning” (International Baccalaureate Organization, 2019). For the upcoming academic year, the IBO has once again revised their approach to assessment to make it even more learner-centered. At the base of all teaching and learning within the PYP there is student agency; this presents itself in simple things like the physical setup of the learning space but more importantly also in the planning and construction of student learning. With the new Collaborative planning process for learning and teaching that is to be used by all PYP schools by the upcoming school year, educators are encouraged to “develop[] students’ capacity to plan, reflect and assess, in order to self-regulate and self-adjust learning” (International Baccalaureate Organization, 2018). In terms of assessment, this means that teachers are to make use of “ongoing monitoring,

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documenting and measuring of learning to inform planning and next steps” as well as use “evidence of learning as a basis for grouping [...] students”. Especially this last point lends itself as an opportunity for the integration of feedback-providing educational applications and was therefore an excellent starting point for the researcher’s work.

## Research design and analysis

### Participants and Context

The context of this research project is a small international school in a rural part of southern Germany, that makes use of the IB Primary Years Program. Participants were four elementary school homeroom teachers as well as one specialist teacher of the school with varying degrees of teaching experience trained in either the United States of America or Germany. One of the homeroom teachers has extensive experience within the IB PYP, while three have formerly been working with the American Common Core system and have only been working with the PYP for this school year. The last teacher has been trained for and working in German national schools before transferring to this school. Additionally, three German national primary schools that make use of the educational application called SELAS, which can supposedly serve as a facilitator of Assessment for Learning were participating in this research project (Hanf, 2019). Lastly, a case study was conducted with a group of nine third-grade students of school X. This acted as the third leg of the triangulation (Cohen, Manion, & Morrison, 2018) as well as a practical test of the hypothetical functionality of SELAS in an international primary school context.

### Research Methods and Methodology

“The ultimate purpose of any knowledge arrived at in educational research is to provide a basis for action, be it at policy level or at a classroom level” (Lakshmi, 2019). For this project, the researcher chose a mixed methods approach that “combines various elements of both quantitative and qualitative approaches” (Cohen et al., 2018, p.87). These two methods show distinct differences in characteristics; while qualitative research uses words, concerns itself with meaning, induces hypothesis from data and is based on case studies; quantitative research makes use of numbers, is concerned with behavior, begins with a hypothesis and

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results in generalizations (Silverman, 2015). Quantitative research, therefore, generates data that allows numerical analysis while a qualitative approach describes a certain phenomenon in context. Combined, they provide both the opportunity to seek explanations for correlations of the different aspects of this project and to gain an understanding of the overarching topic. Especially in educational research that aims to inform classroom practices and support an individual teacher's development, as it is the case for this project, a mixed methods approach has been found to be most beneficial (Lakshmi, 2019).

The most suitable paradigm was a **pragmatist** one which is also the one most commonly used in mixed-methods research and the rationale behind this choice links directly to the purpose and the nature of the research problem (Parvaiz, Mufti, & Wahab, 2016). In pragmatism, instead of the method being dominant, the research problem is viewed as the most important concern (Creswell, 2003), which is why it draws on both numeric and narrative data as well as quantitative and qualitative methods of data collection and analysis. Through that, it meets the needs of the research rather than the preferences of the researcher thus ensuring an unambiguous research product that is most likely to provide a deep insight into the research problem (Cohen et al., 2018).

The Journal of Mixed Methods Research describes the paradigm as follows:

*"[P]ragmatism as a research paradigm supports the use of a mix of different research methods as well as modes of analysis and a continuous cycle of abductive reasoning while being guided primarily by the researcher's desire to produce socially useful knowledge" (Feilzer, 2009).*

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Hence, the researcher made use of *multilevel mixed methods sampling* whereby different kinds of samples are used at different stages of the research process (Cohen et al., 2018). A qualitative research method was used for part of the project which can be characterized as “empirical research where the data are not in the form of numbers” (Blaxter, Hughes, & Tight, 2010, p. 65); this was used for the unstructured interviews with the teachers at school X. For the questionnaires, the researcher made use of a quantitative approach to data collection to receive as reliable an overview of the German national primary homeroom teachers' opinions as possible. Lastly, to be able to draw their own conclusions, the researcher conducted a small-scale case study with a class at school X. Blaxter et al. (2010) state that case studies are ideally suited to the needs and resources of the small-scale researcher as they allow a focus on just one example. They tie into the idea behind pragmatism as pragmatists find that “what something ‘means’ is manifested in its practical, observable consequences and success in practices, with its links to experience, rather than, for example, abstract theory with little practical import” (Cohen et al., 2018, p. 84).

### Research Tools

All questionnaires were designed using a template of Google forms and hence sent out via email to the participants (see Appendix 3). Therefore, responses were completely voluntary and anonymous (Cohen et al., 2018). In accordance with the research plan, the researcher conducted unstructured interviews with the teachers at school X as a follow-up to the questionnaires to be able to investigate the provided opinions in further detail (Blaxter et al., 2010). The students' feedback was gathered anonymously in a table in a shared Google doc, that all students had access to (see Figure 2) and subsequently compared to the informal observation the researcher had made during the trial. Lastly, the German teachers' opinions were gathered directly through a feedback tool inside the app. Participation here was also anonymous and voluntary.

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## Data collection

In order for the results of this project to be as reliable as possible, the researcher made use of methodological and participant triangulation (Cohen et al., 2018). Blaxter et al. (2010) describe this process as using two or more methods to verify the validity of the information being collected, checking the findings from one type of study against the findings deriving from another type. It is thus a combination of qualitative and quantitative research that serves to ensure the reliability and validity of the findings made during this project. In addition to a review of existing literature, there were questionnaires for the German national schools, a questionnaire followed up with unstructured interviews with school X's teachers as well as a case study with a test group of students at school X. To investigate the theoretical background of Assessment for Learning in general and the possibility to support it using ICT in particular, the researcher studied appropriate literature and compared the findings of other researchers to their own (Blaxter et al. 2010). The basis of the unstructured interviews with the teachers at school X was their conception of Assessment for Learning as well as their experiences with using ICT to support formative assessment. The researcher opted for this type of interview as it has been proven to be most useful in explicating the interviewees' understanding of the topic of research, thus producing qualitative information (Menter, Elliot, Hulme, Lewin, & Lowden, 2011). For the quantitative part of the project, the researcher had chosen to hand out questionnaires as these have been recommended by research professionals such as Blaxter et al. (2010) and Menter et al. (2011) for asking concrete questions as well as the collection of a wide range of information. To the researcher they are particularly interesting as "[t]hey can be used to study attitudes, values [and] beliefs" (Menter et al., 2011, p. 105). The questionnaire that was answered by school X's teachers served as a first summary of the teachers' opinions and thus facilitated the follow-up interviews as it provided the researcher with an

Kommentiert [JW2]: DEFINE TERM + REASONS FOR USING IT!!

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understanding of the teachers' prior knowledge and understanding of the topic. The German national primary schools that have been trialing the educational application called SELAS, which claims to facilitate the management of learning, were also sent a questionnaire through the app. Their answers provided the researcher with a range of opinions on the use of ICT for Assessment for Learning. Lastly, the researcher tested SELAS and its potential to support AfL with a test group of students from school X, to extrapolate how feasible it would be in the everyday school life. The results of all three data collection methods were then compared to determine how beneficial ICT tools are for AfL processes and in how far educational applications, like SELAS, would be a useful addition to a teacher's learning management tools.

### Analysis

The analysis of the data collected to the field research part of the project was carried out in accordance with the processes described in Blaxter et al. (2010). Cohen et al. (2018) also describe the necessary steps for qualitative data analysis as "data reduction (in order to avoid the often-serious issue of data overload); data display; data analysis and interpretation; drawing and verifying conclusions; and reporting the analysis and findings" (p.933). Simply put, the researcher could not use all the raw data that she had collected as not all were in line with or even useful for her project. Therefore, she had to make sure to put all gathered information in order and interpret it properly before being able to answer her research questions based on her findings. In accordance with the aforementioned analysis processes, the questionnaires were analyzed thematically; all data from the questionnaires were compared to one another and systematically coded for interesting features and henceforth clustered together in themes. In the ongoing analysis, the researcher then refined these themes and thus generated clear definitions and names for each one always relating them to the overarching topics of the research question (Blaxter

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et al. , 2010). These were then in turn used in the final report, where they were compared to the outcomes of the case study as well the findings from the literature review. In the final steps of data analysis, the results from these comparisons were then related to the research questions. For instance, in order to get a sufficient overview of school X's elementary teachers' perceptions of and experience with AfL, the researcher sent out a Google form that compiled all answers given by the teachers into charts. The researcher then used those charts and percentages as a synoptic view of the teachers' opinions. Closed questions would provide the researcher with charts or graphs and percentages, whereas open questions about detailed opinions would result in lists with the different statements made by the individual teachers.

These statements were in turn compiled according to the topic of their nature and analyzed thematically (Cohen et al., 2018) and clustered by the nature of their content. The researcher started out by pulling the answers from the questionnaires and feeding them into tables, thus organizing them by the kind of information they provided. With the information sorted according to topic and content of the answer, the researcher could then summarize the most important information and use that to answer to research sub-questions of her field research.

Kommentiert [JW3]: Blaxter always keep in mind research question



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What is your experience with supporting your teaching and the management of your students' progress through ICT?

Positive	Negative
I use online assessment data from RAZ-kids and Prodigy to tailor my whole group lessons and my mini-group lessons	There are many programs and systems that purport to make teachers' lives easier. This is often only partially true at best. The best are tied directly to students' work without requiring teachers to enter data separately. These programs and systems also provide regular feedback and reports showing individual, class, grade level, school data and development along a continuum.
I use Google Classroom to track student tasks and Home Learning	
It is very helpful to use ICT for different kinds of teaching. There are some programs, where you can see the progress immediately.	

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If yes, what is your experience with AfL?

→ 4/5 have experience with AfL (all training in US)

Little	Average	Plenty
limited but enough to know it's necessary	I have participated in two seminars by Dylan Wiliam about AfL	I have used the formative and summative assessments of various prescribed curriculum, as well as those I have created myself and/or with others.

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What qualities would an App need to have in order to best support Assessment for Learning?

Specific feedback	Random/ Endorsement of particular App	Critique
<p>Skill targeted and tracked understanding. I also like the ability to select a standard/skill I'm tracking and their individual understanding of it to help me better group my kids for intervention.</p> <p>User friendliness; simple and effective data entry and display; ability to define parameters and individualize data gathering and reporting for individual students as well as classes; regular updates to the teacher compiled by the app itself (with the ability to schedule the timing of such reports/displays).</p>	<p>I really like the quality of ManageBac. I try to use it as much as possible</p>	<p>I don't think that there can be an app that could support all aspects of AfL but Seesaw comes close to it. What apps usually lack is student self-assessment and authentic goal setting.</p>

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→ Good apps that support AfL should...

- Be skill targeted
- Track understanding
- Be user-friendly → simple and effective data entry and display
- Be easy to manipulate to fit individual needs → parameters, data gathering, reporting, goal setting
- Individualized → specific info for every student
- Provide regular feedback to the teacher (automatically)
- Provide opportunities for student self-assessment

Figure 1

[Analysis of the teachers' answers to open questions in the questionnaire at school X]

In order to, properly represent the opinions of the students who partook in the trial, the teacher asked them to fill out a feedback form focused on whether SELAS was useful for them in terms of facilitating their self-assessment of their vocabulary knowledge. Then, the researcher compared the students' feedback with her own observations she had made during the trial. For the opinions of the German schools, the researcher designed a feedback form in collaboration with the developer of SELAS. The feedback the teachers provided, focused specifically on whether SELAS was a useful tool to support AfL and student agency, was gathered in percentage graphs directly through the app. The researcher could thus simply analyze these graphs to get an overview of the teachers' perceptions.

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Student	Feedback	Figure 2
S1	All in all, it was pretty good! Though I wish it showed how many seconds I would have had left when I placed my answer. It was still helpful, so I could make sure I knew the unit vocabulary. In all, I think I'll give it 8/10 stars.	
S2	I like that I got some right. it actually helped me learn. It showed me which words I still needed to practice more and which ones I was sure of.it was really fun. The things that I did not like was that it kept saying "du bist nicht ganz doof".	
S3	I think this should get at least 1,0000000 stars. I liked that it was not too long and not too short, it showed how many answers you had correct or incorrect and that it showed the time I needed to answer all the questions. What I did not like is that it wrote the answers so short and did not explain it so well, so it was hard to know what the website meant (and I clicked that the website should translate it to German, but it did not translate.)	
S4	I liked that it was helping me with things, so I can remember the things like the theory behind some things also. I did not like that it would always say "du bist nicht GANZ doof" I did not like it that much, I rate 2 stars	

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	I mostly understood the vocabulary but not always, I wish it would allow you to translate it
S5	I did not like it because I did not understand some of the words because the quiz was in English.
S6	It was good but still I don't like that the answers are sometimes so short because then you don't know all the information of the word. I learned a few new ways to explain a word.
S7	<i>I didn't like it because the whole quiz was in English and so I couldn't understand the questions, therefore I didn't learn anything.</i>  Mir hat es nicht gefallen, weil es englisch war. Und ich habe nichts gelernt, weil es englisch war.
S8	It was pretty good in the process, but it could use more feedback than just "du bist nicht ganz doof". But in all of it, it was pretty good. I also think that it could also use some more details. But it really helped me with my unit vocabulary.

[Student feedback that was provided individually in a shared document]

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SELAS provides immediate feedback on whether a question was answered correctly + sums up how many correct answers were given after completion  
→ Individual for each student;  
Anonymous for teacher

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shows children how much they know as part of a game → fun  
719 kids say it helped them assess what they know and what they still need to practice

[Observations made by the researcher during the trial]

Figure 3

## HOW DOES ASSESSMENT FOR LEARNING UNDERPIN PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM OF EDUCATIONAL APPLICATIONS, BE USED FOR ADDITIONAL SUPPORT?

### Description of data

AfL and its support through ICT at school X:

Due to time constraints caused by the placement and the responsibility of independently leading a class as well as the busy school calendar during the last term before the summer break, the researcher decided to change some of the data collection methods during the research process. Instead of conducting semi-structured interviews with the Elementary teachers at her placement school, the researcher opted to send out a questionnaire that was to be filled out by all four homeroom teachers as well as the Elementary German teacher individually. The researcher then used the results of said questionnaire and followed it up with unstructured interviews in a more casual setting to further clarify any questions that arose during

**Do you have any experience with Assessment for Learning?**  
4 Antworten

the analysis of the teachers' answers as well as "get a more detailed perspective of some of the issues raised" (Blaxter et al., 2010, p. 205).

This way, the teachers still

had the option to specify and elaborate on their answers and give context to any claims they had made. Furthermore, the questionnaire was set up in a way that the teachers had the option to not answer questions they did not want to, which is why there are only four instead of five answers for most of the questions and diagrams thereof. One of the teachers had formerly been working in German national schools and had thus trouble understanding the specific terminology used in the questionnaire. Furthermore, they had little to no experience with the concept of AfL and therefore chose not to answer the questions that focused specifically on the intricacies of AfL (see Figure 4).

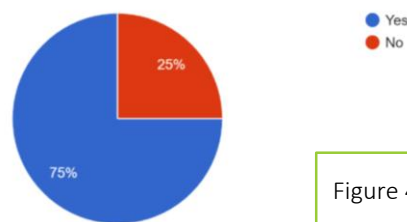


Figure 4



## HOW DOES ASSESSMENT FOR LEARNING UNDERPIN PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM OF EDUCATIONAL APPLICATIONS, BE USED FOR ADDITIONAL SUPPORT?

The consensus of all Elementary homeroom teachers during the follow-up interviews at the researcher's school was that Assessment for Learning is a vital cornerstone of all teaching and planning processes, especially with young children. All homeroom teachers, regardless of the nature of their training, the country or curriculum they had trained in and their level of teaching experience, attested to making use of AfL on a regular basis to monitor and manage their students' progress. When asked why they used AfL or formative assessment in general, the teachers' answers were very similar and can be summarized as follows: Eliciting and interpreting evidence about student achievement helps students and teachers to make better decisions about the next steps in instruction and thus facilitates effective differentiation (William, 2011).

Their approaches to AfL, however, had varied greatly. While the two veteran teachers of the team, that had previously worked in the United States of America, favored the use of paper-based recording tools and keeping a file for each student, the other teachers preferred making use of the options provided to them by the educational applications and websites that they were using with their students regularly anyway. On that, one teacher stated the following:

*"There are many programs and systems that purport to make teachers' lives easier. This is often only partially true at best. The best are tied directly to students' work without requiring teachers to enter data separately. These programs and systems also provide regular feedback and reports showing individual, class, grade level, school data and development along a continuum".*

**Kommentiert [JW4]:** Wo haben die das gesagt? Interviews oder Questionnaires?

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Nevertheless, all teachers agreed that ICT was, at least in some way, beneficial for AfL (see Figure 5). With the school's general policy on online learning and the use of educational websites and online reading databases

such as *Learning A – Z (2002)* as well as more common online class management and portfolio tools such as *SeeSaw* and *Google Classroom*, almost every teacher made use of ICT to support their assessment on a semi-regular basis (see Figure 6).

### Do you think that ICT is beneficial for AfL?

4 Antworten

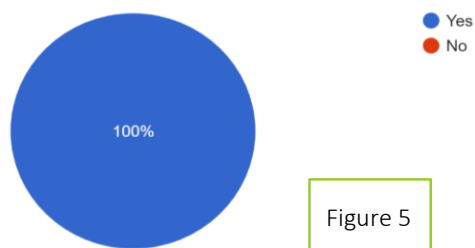


Figure 5

### What kind of applications or websites do you use for AfL?

4 Antworten



Figure 6

They did, however, especially those teaching the younger grades, also make use of more traditional forms and therefore somewhat debatable forms of formative assessment, mainly in the form of running records, reading logs (Clay, 2013) or regular multiplication table timings (Rubenstein, 2019). One reason for that was that teachers felt as though the

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apps they were using were not supporting their side of AfL enough (see Figure 7). One even went as far as to say that they did not “think that there can be an app that could support all aspects of AfL [...]”. What apps usually lack is student self-assessment and authentic goal setting”. Of the apps they were using, the teachers at school X expected the following:

*“User-friendliness; simple and effective data entry and display; ability to define parameters and individualize data gathering and reporting for individual students as well as classes; regular updates to the teacher compiled by the app itself (with the ability to schedule the timing of such reports/displays).”*

Furthermore, they stressed the importance of “[s]kill targeted and tracked understanding”, stating that they appreciated “the ability to select a standard/skill [to] track [...] their [students’] understanding of it to help [them] better group [their] kids for intervention”.

### Do you feel like these apps support your AfL (enough)?

4 Antworten

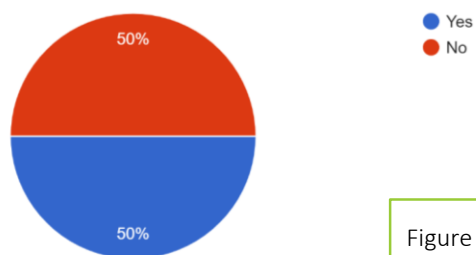


Figure 7

German primary schools already using SELAS:

The developer of the educational app, SELAS, that was part of this study, suggested that it would be easier for both the researcher and the three German primary schools currently

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trialing it, to have a data collection through the app itself rather than sending out questionnaires to the head teachers of each school individually. For data protection reasons, all schools were still informed about this process as well as provided with a translated consent form that informed them about the research in detail, however no personal contact was established between the researcher and the schools currently using SELAS. Instead of providing each school with a questionnaire, the researcher and the developer of the app designed a feedback tool, that asked teachers to describe their experience with SELAS and in how far it helped them with managing their students' progress. These feedbacks were collected in the app itself and then sent to the researcher for analysis.

The results of this data collection were positive, as expected. Schools that have been trialing SELAS for the past school year, have been very content with the way it supports the teacher in monitoring the whole class' progress. However, most of the schools that are currently trialing SELAS are secondary schools which focus more on summative assessment and thus do not use the app for AfL. Therefore, the researcher could not use these in her data collection as that would have changed to research context too much. The pool of participating primary schools was small in comparison to the overall number of participating schools, however the experiences of the schools that the researcher received via the feedback tool were very positive in terms of how well SELAS supported the homeroom teachers' learning management.

Nevertheless, the average amount of students per class in those German schools is around 30 and this made for a very different learning environment than that of school X.

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Case study trialing SELAS with a third grade at school X:

School X's third Grade had a broad spectrum of computer skill levels. While some children worked with computers on a daily basis and were versed enough to use their chrome books without any assistance, other children had only been using theirs for a matter of



Figure 8

weeks. Even though the use of technology was encouraged by the school, this was an obstacle for the researcher and her trial. During the case study, the researcher trialed the desktop version of the app to check Grade three's understanding of the unit vocabulary for the Unit of Inquiry they were currently working on. During the trial run of SELAS, the third-grade students were working on the Unit of Inquiry focused on '*How the World Works*'. The vocabulary had been an important cornerstone of the Unit and the children had been working on them as part of a word study for the first weeks of working in the new unit. Theoretically, they should have thus all been able to not only spell and use those words in a sentence but also to explain each one in their own words as they had not only studied the words as they would for foreign language vocabulary but they had also used them over a number of weeks as they were working on sub-topics and questions related to their central idea. SELAS was used to check their understanding through a multiple-choice quiz, that gave them four different possible definitions for the vocabulary words in question; one correct and three false. Generally, the children enjoyed 'toying' with this new technology and the quiz aspect of SELAS and they appreciated the immediate feedback on whether they had answered the questions correctly. Furthermore, they liked being told how many of their answers had been correct in total and how long it had taken them to answer them all. In the classroom feedback form see Figure..., most children described their impression

Kommentiert [JW5]: WO ANDERS HINI → WO?

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of the quiz as follows: "It was [] helpful, so I could make sure I knew the unit vocabulary"; "It showed me which words I still needed to practice more and which ones I was sure of"; "it really helped me with my unit vocabulary" and "I learned a few new ways to explain a word". For the children, taking the quiz and being provided with immediate feedback about their knowledge was thus a positive experience and, according to their feedback, helped them assess their own grasp of and progress within the unit vocabulary. For the English language learners (ELL), however the experience was much less gratifying as they "did not understand some of the words" and therefore struggled with answering the questions.

The anonymous and plenary overview of the class that the teacher received at the end, however, was not conducive to the researcher's assessment of their understanding. While the children knew exactly what questions they had struggled with, the teacher only saw how many students had answered which question correctly or incorrectly. Had this group been twice or even thrice as big, a plenary overview would have perhaps been helpful. As it stood, however, with a group this small, monitoring each child's level of understanding individually was not only easier but also more practical in terms of designing each child's individual learning trajectory and managing their progress within the Unit of Inquiry. Especially with something as crucial to the children's understanding and progress within the unit of inquiry, the teacher needs to know exactly which child is still struggling with which concept in order to best be able to help them further their understanding. The results of the quiz as shown in percentages does not give the teacher any clue as to which students gave which answers and it is thus impossible to link false answers to the individual learning needs of the children. Furthermore, as the setup of the quiz tool is rather playful, the children had trouble taking the task seriously and staying on track with answering the questions. This was especially true for the two ELL students of the class that became frustrated quickly and then gave up. Therefore, it is the researcher's impression that the

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students' performances stayed well below their potential which in turn warped the results of the quiz in general.

This opinion was also shared by the other elementary teachers during a discussion about SELAS and its possibilities; while they liked some of the aspects of it, they also believed that Assessment for Learning needs to be individualized and tailored to each student and thus a plenary overview of the whole class' progress would not be helpful for that.

Furthermore, the students struggled with how to use their computers for this activity. Moyles et al. (2011) state on this that "...it has been argued that teachers cannot assume that all children develop digital skills similar to one another" (p.169). For SELAS to be optimally useful, it would thus have to become a fixed part of the children's learning, assessment and self-reflection routine and be used on such a regular basis that all children could use it without needing any assistance from the teacher. The test group was very open to the possibility of integrating SELAS into their practice and review routines, some children even asked the researcher whether they would be allowed to keep practicing with the app at home.

### Quality

To get a research product that is reliable and valid, the researcher made use of triangulation as described in Menter et al. (2011). All questions for the interviews and questionnaires were first presented to the researcher's group of critical friends and, if necessary, their thesis mentors to ensure that they were understandable and unambiguous. During the analysis, the researcher carefully considered all sides and opinions of the topic in question and therefore analyzed both positive and negative points of view concerning AfL in general and the use of ICT in AfL in particular. The combination of qualitative and quantitative

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methods of data collection and analysis hereby served to strengthen the validity of the research (Cohen et al., 2018).

As for the field study; since the researcher is acquainted with the developer of the application that was tested, there was the possibility that the researcher could be biased regarding its usefulness. To circumvent that, the researcher primarily relied on their own opinion when looking at the results of the field study, but also questioned the class teacher of the test group as well as the test group itself and thus compared the opinions to obtain an unambiguous result (Cohen et al., 2018). Furthermore, the researcher cross-referenced and compared all findings of the field research to the findings of the literature review. Through using a mixed methods approach throughout the entire project, the researcher received “a more complete picture of the phenomenon under study than would be yielded by a single approach, thereby overcoming the weaknesses and biases of single approaches” (Cohen et al., 2018, p.87).

### Ethics

As “[...] all social research (whether using surveys, documents, interviews or computer-mediated communication) gives rise to a range of ethical issues around privacy, informed consent, anonymity, secrecy, being truthful, and the desirability of the research” (Blaxter et al. 2010, p.161), there were a number of measures taken to avoid any ethical issues. Especially as this project was largely based around communication technologies and the internet, having all participants' informed consent was paramount to avoid any ethical dilemmas. All participation took place on a strictly voluntary basis, with consent forms being handed out to all participants prior to the actual research phases (Cohen et al., 2018). The consent forms (See Appendices 1 and 2), written according to the guidelines described by Blaxter et al. (2010), informed the volunteers about their rights in the research project. It,



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furthermore, educated them about the reasons and purposes of the research as well as ensured their anonymity and disclosed that all responses and outcomes of the data collection will remain unpublished. Lastly, the document contained information about the use, storage and deletion of all data collected during the research process and also disclosed to the participants that they have the possibility to withdraw from the project at any time they wish. Given that some of the data collected during this project may be personal or sensitive, the researcher needed to take the necessary precautions in terms of data storage (Cohen et al., 2018). All data collected during this project was anonymized and kept securely on an external hard drive which only the researcher had access to. It will be stored there for the duration of the research process until the researcher has successfully passed her final thesis and will be destroyed thereafter.

## Research Conclusion

### *How does school X make use of ICT to support assessment for learning?*

To be able to answer this question as thoroughly as possible, it has to be split into two parts; “Does school X practice Assessment for Learning?” and “How does school X support AfL with ICT?”.

### *Does school X practice Assessment for Learning?*

School X is a PYP school and as that follows IB’s guidelines regarding the instruction and assessment of their elementary age students. According to the official PYP documents as well as Davidson and Carber (2012), authors of *Taking the PYP forward*, “[f]ormative assessment is at the heart of the PYP approach to assessment” (p.56).

On their website, the International Baccalaureate Organization states the following regarding the purposes of assessment in the Primary Years Program:

Assessment serves to promote student learning as well

as provide information about it to

the teachers and thus

contribute to the successful

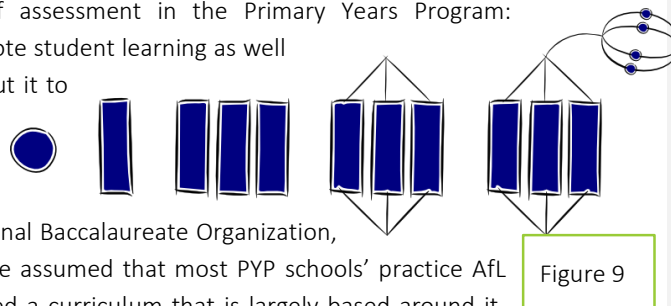
implementation of the

program at large (International Baccalaureate Organization,

2019). Accordingly, it can be assumed that most PYP schools’ practice AfL

simply because they adopted a curriculum that is largely based around it.

School X is no different; as their PYP coordinator is also a PYP workshop leader that has been part of the team that shaped the latest revisions of the program, the school dedicates a lot of time and effort to improve structures to increase student agency throughout the Elementary Department. Elementary teachers are encouraged to base their management of pupils’ progress upon regular formative assessment as much as possible as well as provide their students with ample opportunities to co-create their own learning and assessment. To support that, the school has just recently adopted the SOLO taxonomy (see Figure 9) as developed by Biggs and Collis (1989) and adapted for classroom use by Pam



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Hook (2016). Hook's take on the SOLO taxonomy essentially splits up the children's learning processes into four to five stages;

Each stage then describes the development the individual children would make and the ideas and connections they would have to develop in order to move on to the next step. When planning a new Unit of Inquiry, Elementary teachers at school X use the SOLO template to split up each Line of Inquiry into bite-size pieces. The template is then used during the instruction process and, most importantly, during assessment. Knowing exactly what concepts a child would have to develop when helps the teachers in their formative assessment and ongoing review as it essentially provides them with a checklist for the development that should take place (Hook, 2019). The SOLO taxonomy is not only used by teachers, however. Students use the same template when planning out their inquiry for a new unit. Just like the teachers did for the whole unit, the students split up their inquiry processes into short-term goals for each line of inquiry they will be working on. This not only helps them to visualize the assessment criteria and plan out their learning, it holds them accountable and ultimately helps them reflect on the process and their progress better (Hook, 2016).

Furthermore, school X completes all planning, assessment and reporting processes through a "curriculum-focused learning platform" called *Managebac* (2019), developed specifically

to fit the needs of IB schools. Here, teachers record their planning for the Units of Inquiry including the Scope and

Sequence, skills to be developed as well as what aspects of the IB learner profile will be fostered in the course of the unit (Cushman & Baron, 2017). Additionally, teachers can create formative as well as summative assessment tasks and record their outcomes. Students have access to the unit planning as well as the assessment criteria for all projects that are to be carried out during the unit and can use the provided information for their SOLO planning. Nevertheless, Managebac mainly supports the teachers' side of AfL.

School X does, however, also make use of more traditional, non-ICT based, approaches to student agency and AfL. In accordance with the PYP guidelines for instance, students, guardians and teachers have so-called three-way conferences once per term (Zimmer,

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2016). The first conference serves as an opportunity for goal setting and takes place at the very beginning of the year. In the second term, these goals are revisited and reflected on; were they reached? If yes, what are our new goals? If no, what can we do to reach them? Finally, in the last weeks of term three, all parties come together again to look at the student's progress over the year, check whether the goals set at the beginning of their year were accomplished and set new goals for the upcoming year.

It is this balance of ICT and paper-based assessment tools, that makes AfL so successful and effective at school X and, in combination with the small class sizes, allows the teachers to really individualize each student's learning trajectory and each student to take ownership of their learning and progress.

#### *How does school X support AfL with ICT?*

Apart from *Managebac*, school X provides teachers and students with a multitude of ICT tools to support teaching and self-assessment. With all students owning and using a laptop by grade two, the teachers have the possibility to monitor their students' progress on the various learning websites they use on a daily basis (Chiong & Shuler, 2010). These websites, used mainly for practice purposes in mathematics and literacy, also provide the students with regular feedback of their achievements and progress and thus help the students to assess their own understanding of the contents. With that, school X shares Moyles, Georgeson, & Payler's (2011) believe that "it is important for teachers to cultivate a positive ethos around the use of digital technology in the classroom". Both the authors and the leadership team at school X "recognize [] the ways in which developments in the technological landscape influence how children today learn, as well as the concept of their learning" (p.168).

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The websites used by school X include online reading databases for literacy such as *Learning A-Z* (2002) and *Newsela* (2019), where children get to pick pieces of fiction as well as non-fiction writing from a vast database to read and subsequently answer a number of questions on the pieces they have read to show their understanding of the material. The children are aware of and familiar with this process and generally seem to enjoy completing the small quizzes. Once they have answered all the questions, they receive feedback from the website on how they did and are encouraged to use it to reflect on how well they understood their reading material. Each child can access their personal database and monitor their own progress while the class teachers have access to all children's answers and can thus track each individual student's progress and use this data to differentiate their teaching more effectively (Chiong & Shuler, 2010).

For mathematics, most teachers regularly use a website called *Prodigy* (2016), that allows students to playfully practice their skills. This website, too, provides feedback to the students and teachers on the students' progress and thus helps inform their AfL. The website hosts curriculum-aligned math games for Grades one through eight and provides teachers with real-time reports of the children's results, enabling them to "[q]uickly see which skills [their] students have mastered, and where they may need some additional support" (Prodigy, 2016).

### *How does the application SELAS support assessment for learning and how could school x benefit from using it?*

SELAS is a combination of several tools used by schools on a daily basis, among them an attendance monitoring tool and an interactive parent website similar to *SeeSaw* (Hanf, 2019). The app provides schools with the option to have all their management tools in one place rather than divided between several different applications and websites. The quiz-

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tool, that was one of the focal points of this research project, is only one of several possible usages for SELAS. The tool provides teachers with a pre-existing question database on a broad variety of topics and subjects appropriate for various grade levels. All of these are, however, in German which is why the researcher had to create her own pool of questions for the trial. Furthermore, there is the option for teachers to design their own questions to best fit their purposes as well as for their students to submit original questions. Through that, students have the possibility to challenge their teachers or parents on the quiz-tool (Chiong & Shuler, 2010). Simply put, SELAS' quiz tool is an academic, feedback-providing version of *Kahoot*, a quiz app that is already popular among teachers. For the teachers, it works on an anonymous, whole group basis and is therefore very much useful when one wants to get an unbiased overview of a whole class' level of progress. Unlike *Kahoot*, and as already mentioned above, students receive a detailed report of their correct and incorrect answers. Once all students have answered the teacher's questions, the teacher receives an overview of the class' answers through pie charts and percentages. Since the developer of the app is German and had originally designed it for German schools, it very much caters towards the needs of German national school teachers, that have to monitor and manage the progress of up to 35 students per class and rely more on summative assessment than on AfL to do so.

As school X's classes do not surpass a number of 13 students per class and the school has adopted the PYP's approach to assessment and reflection, learning and assessment are foremost individual and tailored towards each student's needs. Having a group-based overview of the class' progress is therefore only partly useful. School X specifically advertises this individualized support in their mission statement and with only 100 students across twelve grade levels up to IB DP level, they would need a tool that would facilitate

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individualized Assessment for Learning rather than one that provided anonymized overviews (International Baccalaureate Organization, 2018).

### Discussion and Recommendations

As already stated above, a number of issues arose during the data collection phase of this project. The biggest issue in terms of validity and significance was the relatively small scope of the collected data that was a result of the small number of participants. As school X is very small, there was only a very limited number of homeroom teachers the researcher could interview. Also, the trial class for SELAS only consisted of 9 children, which limited the spectrum of their feedback. If this research were to be taken further, it would therefore be important to get a broader scope through bigger sample sizes for both the trial and the interviews. The app should be tested across different age groups and ability levels to fully explore its usefulness regarding the support of student agency. As the field of educational apps is a very young one, there has not been much research done focused on in-class use of apps like SELAS. It would thus be interesting to conduct a longitudinal study assessing the influence of an introduction of such an app to the children's daily learning and assessment practices on the development of student agency. Lastly, the researcher has noticed a number of similarities between ManageBac and SELAS; a comparison between the two would therefore be interesting to see whether SELAS could be an affordable alternative, especially for German national schools.

### Limitations

Due to the very particular context of this project, the findings are only partly useful for anyone but the researcher herself. As SELAS has not been adapted for the international market yet, users have to be fluent in German in order for the app to fulfil its potential. Furthermore, the researcher's internship school was very small with very small classes

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which made it easier to stress student agency and AfL in daily classroom practices. Nevertheless, the researcher's findings regarding the use of ICT to support AfL can be used in various contexts, regardless of curriculum background and class size.



## References

- Atjonen, P. (2014, February 6). Teachers' views of their assessment practice. *The Curriculum Journal*, pp. 238-259.
- Biggs, J., & Collis, K. (1989, August 1). Towards a Model of School-based Curriculum Development and Assessment Using the SOLO Taxonomy. *Australian Journal of Education*, 33(2), pp. 151-163. Retrieved May 11, 2019, from <https://journals.sagepub.com/doi/abs/10.1177/168781408903300205>
- Black , P., & Wiliam, D. (1998). *Inside the Black Box: Raising standards through classroom assessment*. London: GL Assessment.
- Blaxter, L., Hughes, C., & Tight , M. (2010). *How to research* (4. ed.). Mc Graw-Hill, Open University Press.
- Breiter, A. P., Stolpmann, B. E., & Zeising, A. D. (2015). *Szenarien lernförderlicher IT-Infrastrukturen in Schulen - Betriebskonzepte, Ressourcenbedarf und Handlungsempfehlungen*. BertelsmannStiftung.
- Cambridge Assessment International Education. (2017). *Assessment for Learning*. UCLES.
- Carroll, M., & McCulloch, M. (2014). *Understanding teaching and learning in primary education*. London: SAGE Publications Ltd.
- Chiong, C., & Shuler, C. (2010). *Learning: Is there an app for that? Investigations of young children's usage and learning with mobile devices and apps*. New York, NY: The Joan Ganz Cooney Center .
- Clarke, S., Timperly, H., & Hattie, J. (2001). *Unlocking Formative Assessment* . London: Hadder and Stoughton.
- Clay, M. M. (2013). *An Observation Survey of Early Literacy Achievement* (3. ed.). Portsmouth, NH, USA: Heinemann.

HOW DOES ASSESSMENT FOR LEARNING UNDERPIN PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM OF EDUCATIONAL APPLICATIONS, BE USED FOR ADDITIONAL SUPPORT?

- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education*. New York, NY: Routledge.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks: Sage Publication.
- Cushman, K., & Baron, W. (2017, May 3). The art and science of developing student agency. *New teacher center*. Retrieved May 28, 2019, from <https://newteachercenter.org/blog/2017/05/30/art-science-developing-student-agency/>
- Davidson, S., & Carber, S. (2012). *Taking the PYP forward: The future of the IB Primary Years Programme*. Melton, Woodbridge: John Catt Educational Ltd.
- Dixon, D. D., & Worrell, F. C. (2016, April 1). Formative and Summative Assessment in the Classroom. *Theory Into Practice*, 55(2), pp. 153-159. doi:10.1080/00405841.2016.1148989
- Dunn, D. (2012). *How to be an outstanding primary school teacher*. London: Bloomsbury.
- Feilzer, M. Y. (2009, October 22). Doing Mixed Methods Research Pragmatically: Implications for the Rediscovery of Pragmatism as a Research Paradigm. *Journal of Mixed Methods Research*, pp. 6-16.
- Grigg, R. (2015). *Becoming an outstanding primary school teacher*. Abingdon, Oxon: Routledge.
- Hanf, S. (2019, May). Smart Education Learning Analytics System - SELAS. (J. Werner, Interviewer) Einhausen, Thuringia, Germany.
- Hansen, A. (2012). *Transforming Primary QTS: Primary Professional Studies*. London: Learning Matters Ltd.
- Hawe, E., & Dixon, H. (2016, September 25). Assessment for learning: a catalyst for student self-regulation. *Assessment & Evaluation in Higher Education*, pp. 1181-1192.

HOW DOES ASSESSMENT FOR LEARNING UNDERPIN PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM OF EDUCATIONAL APPLICATIONS, BE USED FOR ADDITIONAL SUPPORT?

Hook, P. (2016). *First Steps with SOLO Taxonomy - Applying the model in your classroom*. Invercargill, NZ: Essential Resources Ltd.

Hook, P. (2019, May 11). *HookED*. Retrieved from SOLO taxonomy: <http://pamhook.com/solo-taxonomy/>

International Baccalaureate Organization. (2018). Collaborative planning process for learning and teaching.

International Baccalaureate Organization. (2019). *International Baccalaureate*. Retrieved from Primary Years Programme: <https://www.ibo.org/programmes/primary-years-programme/curriculum/taught-curriculum/>

Lakshmi, D. (2019). *Research Paradigms in Education*. Central University of Gujarat, School of Education.

*Managebac*. (2019). Retrieved from <https://www.managebac.com/>

Menter, I., Elliot, D., Hulme, M., Lewin, J., & Lowden, K. (2011). *A guide to practitioner research in education*. London: Sage.

Moyles, J., Georgeson, J., & Payler, J. (2011). *Beginning teaching, beginning learning in Early Years and Primary Education*. Maidenhead, Berkshire: Open University Press.

Muijs, D., & Reynolds, D. (2011). *Effective Teaching: Evidence and Practice*. London: SAGE Publications Ltd.

Murchan, D., & Shiel, G. (2017). *Understanding and applying assessment in education*. London: SAGE Publications Ltd.

Nicol, D., & Milligan, C. (2006). Rethinking technology-supported assessment practices in relation to the seven principles of good feedback practice. In C. Bryan, & K. Clegg, *Innovative Assessment in Higher Education* (pp. 1-10). London: Taylor and Francis Group Ltd.

HOW DOES ASSESSMENT FOR LEARNING UNDERPIN PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM OF EDUCATIONAL APPLICATIONS, BE USED FOR ADDITIONAL SUPPORT?

- Parvaiz, G. S., Mufti, O., & Wahab, M. (2016). Pragmatism for Mixed Method Research at Higher Education Level. *Business & Economic Review*, 8(2), pp. 67-79. Retrieved June 4, 2019, from [https://www.researchgate.net/publication/312235886\\_Pragmatism\\_for\\_Mixed\\_Method\\_Research\\_at\\_Higher\\_Education\\_Level](https://www.researchgate.net/publication/312235886_Pragmatism_for_Mixed_Method_Research_at_Higher_Education_Level)
- Pollard, A. (2014). *Reflective teaching in schools*. London: Bloomsbury.
- Price, H. (2009). *The Really Useful Book of ICT in the Early Years*. New York: Routledge.
- Prodigy. (2016). (SMARTeacher Inc.) Retrieved from <https://www.prodigygame.com/>
- Rubenstein, A. (2019). Exploring the use of known strategies for achieving fluency of multiplication and division facts in third grade. Retrieved from [https://digitalcommons.otterbein.edu/stu\\_master/17](https://digitalcommons.otterbein.edu/stu_master/17)
- Silverman, D. (2015). *Interpreting Qualitative Data* (5. ed.). London, UK: SAGE Publications Ltd.
- Swaffield, S. (2008). *Unlocking Assessment: Understanding for Reflection and Application*. Abingdon: Routledge.
- Swaffield, S. (2011, November 7). Getting to the heart of authentic Assessment for Learning. *Assessment in Education: Principles, Policy & Practice*, pp. 433-449.
- Wiliam, D. (2011). *Embedded Formative Assessment*. Bloomington, IN, USA: Solution Tree Press.
- Zimmer, C. (2016, Juni 6). What is student agency and should we care? *COETAIL*. Retrieved May 28, 2019, from <https://coaches.coetail.com/2018/06/06/what-is-student-agency-and-should-we-care/>

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## Time schedule, Support & Professional development

Date	Time schedule	Support	Professional development
<b>September – December 2018</b>	Look into possible topics as well as research methods to use during BA thesis project	Conversations with critical friend group regarding possible topics + projects to carry out during final TP	Choose thesis supervisor + preliminary topic
<b>January 2019</b>	<p>Finalize research questions during Bachelor bootcamp</p> <p>Carry out literature review for the first four sub questions: read appropriate literature, summarize and put into proposal</p> <p>Finalize choice of data collection methods as well as research paradigm</p> <p>→ write and hand in thesis proposal</p>	<p>Conversations with critical friend group as well as supervisor about topic, questions, methods, etc.</p> <p>Conversation with app developer for support during TP</p> <p>→ send preliminary outline of proposal to supervisor</p> <p>→ send finished proposal to critical friends for proof reading</p>	<p>Read up on information about ICT as well as assessment for learning and possible connections between the two</p> <p>Confirm placement at TP school and meet with mentor teacher as well as head of school in person to get the necessary permissions for the project</p>

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<b>February 2019</b>	<p>Between hand-in of proposal and start of TP: set up questionnaires to send out to the German schools and get in contact with the via the developer of the application</p> <p>Get familiar with the app and set up class login for the test group</p> <p>Decide on questions for the interviews and try them out with test group of critical friends</p> <p>Obtain permission of HoS for the interview questions</p>	<p>Conversations with critical friend group as well as supervisor and mentor teacher at school x</p>	<p>Develop ICT skills to use in every-day school life and for assessment for learning in particular</p>
<b>March – May 2019</b>	<p>Evaluate result of questionnaire</p> <p>Carry out interviews with the PS teachers at school x → summarize results and evaluate the outcomes</p> <p>Carry out case study of Grade 3 class → evaluate results of case</p>	<p>Contact with critical friend group as well as supervisor in case of questions or problems</p> <p>Cooperation with colleagues and mentor teacher at school x</p>	<p>Deepen personal knowledge of using ICT for teaching and assessing</p> <p>Use other teachers' knowledge and experiences to broaden own knowledge</p>




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	study + analyze own as well as children's experiences	Contact with app developer to use SELAS as profitable as possible	Use mentor teacher's expertise to become more proficient in using ICT regularly
<b>June 2019</b>	Put all data together and evaluate them according to the research questions as well as the results of the literature review  → write thesis	Contact with supervisor  Conversations with critical friends + proof reading by them  Conversations and exchange of feedback with app developer	Draw own conclusions about Assessment for Learning and using ICT in school  Develop skills in the field of ICT with regard to management of pupil progress and learning

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### Appendix

#### Appendix 1: Consent form – English version



**Consent Form for Research Participation**

**Study Title:** ITEPS (International Teacher Education for Primary Schools)

**Student Researcher:** Jessica Werner, [jessica.werner@student.stenden.com](mailto:jessica.werner@student.stenden.com) ([j.werner@the-ism.de](mailto:j.werner@the-ism.de))

I am a student at NHL Stenden University of Applied Sciences, at the Education Campus in Meppel, the Netherlands. I am currently in my final year of teacher training and for our bachelor's thesis we were asked to conduct a field research in the subject "Research and Academic Writing Methods". I am completing a 10-week internship in [REDACTED] Elementary department, teaching Grade 3 in mathematics and literacy/ Uol. During the period of my teaching practice, [REDACTED] will be my curriculum mentors. For my research paper, I am going to be conducting a field research with the Elementary teachers as well as Grade 3. With the teachers I will be conducting interviews on their opinions and experiences with Assessment for Learning particularly supported by technology. Together with the students I will be trialling an App that supposedly facilitates AfL. This form contains important information about the reason behind my project as well as what exactly I am planning to do and how am planning on recording my findings. In the following, one can see a brief overview, about the topic of my research paper, what the research interview questions will be about and how I will protect the collected information.

**What is the topic of my research paper?**

My research will be revolving around the following question: How does Assessment for Learning underpin pupils' progress and how can ICT, in the form of educational applications, be used for additional support?

For that, I will be questioning the teachers about their beliefs on AfL in general and the use of ICT for AfL in particular to get an overview about how they have been addressing formative assessment so far and what experiences they have made with that during their careers. Furthermore, I will be trialling an App called SELAS with the students of Grade 3 in order to find out whether it could be a helpful tool for formative assessment.

**What will be the context of the interviews and its aim?**

The interviews I will be conducting will be in the context of classroom and progress management and will therefore be looking at my topic from a teacher's perspective. Ideally, they will give me an overview of how the Elementary teachers at [REDACTED] make use of ICT to support their formative assessment, or what their stance is on AfL in general. Combining the findings from these interviews with the outcomes of my field study with Grade 3 will hopefully give me a good overview of how useful an introduction of SELAS for AfL would be in this context.

**Study location:** All study procedures will take place in the Elementary department of the [REDACTED]

I would like to audio-record interviews to make sure that I remember all information you provide accurately. I will keep these recordings in password protected files on my personal password saved laptop, they will only be used by me and read by my research lecturer at NHL Stenden University of Applied Sciences. If you prefer not to be audio-recorded, I will take notes instead.

You will have the possibility to hear the interview again, read the transcripts of the interview and make remarks or changes when you see the necessity.



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### Consent Form for Research Participation



#### What are the possible risks or discomforts?

The children's participation in this study does not involve any physical or emotional risk to them beyond that of everyday life.

If the interviewee teachers are uncomfortable with some of the questions and topics I will ask about at any time, they are free to not answer, to skip to the next question, take a break or stop the interview.

#### What are the possible benefits for me or others?

The children will likely not have any direct benefit from being part of this research study.

This study is designed to give me as a trainee teacher, an overview of seasoned teachers' experiences with Assessment for Learning and ways to support this procedure through ICT. The field study aspect is supposed to give me an idea of how useful an introduction of an app like SELAS to my future classroom(s) would be in terms of facilitating AfL.

#### How will I protect the information I will collect about the children, and how will that information be shared?

Any audio-recordings from the interviews will be stored in password protected files on my personal, password-protected computer. Any interviews I don't audio-record will also be stored on my computer in written form.

They will only be stored for the duration of my research project and subsequently be destroyed. Furthermore, they will only be used by me and read by my research lecturer from the NHL Stenden University of Applied Sciences. For the interviews, I will not use full names. The teachers will have the possibility to see the notes I took during the interview, read the transcripts and make remarks or changes when they think it is necessary.

Results of this study will be used in a research paper for university purposes only. My field study will not be published. The study data will be handled as confidential, will be saved in a password protected file only on the researcher's laptop until the end of the study.

#### What are the children rights as a research participant?

The **participation is voluntary**, I will ask them whether they would be willing to help me trial the App for my research project. They have the **right to withdraw their consent or discontinue participation at any time** and they will not be penalized in any way for deciding to stop participation. The teachers as interviewees have the right to refuse to answer particular questions. The results of this research study will be presented in a research paper for university purposes only. The students' as well as teachers' individual privacy will be maintained in all written data resulting from the study. All personal information will be anonymized at all times.

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**Consent Form for Research Participation**

If there are any questions or concerns about this research study, please contact me!

If you have questions, you are free to ask them now. If you have questions later, you may contact the researcher at:

Name: Jessica Werner

Mail: [jessica.werner@student.stenden.com](mailto:jessica.werner@student.stenden.com)

(or for the duration of my internship: [j.werner@the-ism.de](mailto:j.werner@the-ism.de))

Phone: +4915759038085

If you have any questions about this research, you can contact the research supervisor at NHL Stenden University of Applied Sciences:

Vanessa Armstrong

[vanessa.armstrong@stenden.com](mailto:vanessa.armstrong@stenden.com)

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### Appendix 2: Consent form – German version



#### Einverständniserklärung zur Teilnahme an einem Forschungsprojekt im Rahmen einer Bachelor Arbeit

**Studienrichtung:** ITEPS (International Teacher Education for Primary Schools); internationales Grundschullehramt

**Bachelorstudentin:** Jessica Werner, [Jessica.werner@student.stenden.com](mailto:Jessica.werner@student.stenden.com) ([j.werner@the-ism.de](mailto:j.werner@the-ism.de))

Ich bin Studentin an der NHL Stenden University of Applied Sciences an der Fakultät für Lehramt in Meppel in den Niederlanden. Da ich derzeit in meinem letzten Semester bin, muss ich im Rahmen meiner Bachelorarbeit eine Forschungsarbeit schreiben. Im Zuge dessen befinde ich mich zur Zeit in einem 10-wöchigen Praktikum an der [REDACTED] wo ich für die nächsten Wochen die dritte Klasse in den Fächern Mathematik und Sprachfertigkeiten übernehmen werde. Für mein Projekt untersuche die App SELAS auf ihre Tauglichkeit im Zusammenhang mit Assessment for Learning \*.

Um ein möglichst unvoreingenommenes Ergebnis zu erhalten, möchte ich mir zusätzlich zu meinen Erfahrungen mit der App und deren meiner Schüler auch die Daten anderer Schulen einholen, die die App bereits nutzen/ getestet haben.

Diese Einverständniserklärung beinhaltet genauere Informationen zu dem Zweck dieser Forschungsarbeit sowie Angaben zu was genau ich vor habe and wie ich meine Ergebnisse festhalten werde. Im Folgenden finden Sie einen kurzen Überblick über mein Thema sowie die genauen Fragen die ich mir im Laufe meiner Arbeit zu beantworten erhoffe. Zum Schluss finden sie außerdem Informationen zu Datenverarbeitung und -speicherung.

(\*Erklärung: <https://www.bpb.de/lernen/digitale-bildung/werkstatt/255718/formative-assessment-bewerten-um-des-lernens-willen> )

#### Das Thema meiner Forschungsarbeit

Meine Bachelorarbeit beschäftigt sich mit dem Thema Assessment for Learning and wie Afl genutzt werden kann um den Lernfortschritt der Schüler zu dokumentieren und unterstützen. Dabei liegt mein Fokus vor allem auf den Möglichkeiten das so genannte *formative assessment* durch Technik zu unterstützen.

Für den Hauptteil der Arbeit werde ich dafür mit den Schülern und Lehrern an meiner Praktikumschule zusammenarbeiten und deren Meinungen und Erfahrungen zu dem Thema analysieren. Um meine Arbeit jedoch so aussagekräftig wie möglich gestalten zu können, benötige ich auch zudem die Daten von Schulen die bereits Erfahrung mit der Verwendung von SELAS haben.

Dadurch werde ich am Ende meiner Forschung hoffentlich einen Überblick über die Möglichkeiten zur technischen Unterstützung von Afl bekommen sowie herausfinden wie sinnvoll eine Introdution von SELAS im Kontext meine Praktikumschule wäre.

#### In welchem Kontext steht die Datenerfassung und wofür benötige ich sie?

Die Datenerfassung dient zur Meinungserfassung von möglichst vielen Lehrern und/oder Schulleitern die bereits Erfahrung mit SELAS haben. Sie sollen mir einen Überblick darüber verschaffen, wie sinnvoll SELAS für individuelle Klassen und deren Management ist, sowie inwiefern man die App für Afl nutzen kann. Dadurch kann ich sehen für welche Klassengröße und in welchen Kontext eine solche App Sinn

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### **Einverständniserklärung zur Teilnahme an einem Forschungsprojekt im Rahmen einer Bachelor Arbeit**



macht und so Rückschlüsse ziehen auf die Verwendungsmöglichkeiten von Lern- und Schulapps im Allgemeinen.

#### Mögliche Risiken

Dadurch, dass die Datenerfassung pro Schule erfolgt, können keine Rückschlüsse auf einzelne Klassen oder Lehrer gezogen werden. Daher gibt es keine Risiken für Einzelne.

#### Welche Vorteile ergeben sich aus dieser Studie (für mich und andere)?

Die Studie ist so aufgebaut, dass sie mir als angehender Lehrerin einen Überblick über die Verwendungsmöglichkeiten von ICT im Zusammenhang mit Assessment for Learning gibt. Durch die Arbeit an meiner Praktikumschule erhalte ich Einblicke in den Erfahrungsschatz erfahrener Lehrer was die Praxis mit formative assessment sowie die Verbindung von AfL mit iCT angeht. Während meiner Feldstudie mit den Kindern der dritten Klasse, werde ich selbst Erfahrungen sammeln im Hinblick auf Möglichkeiten mein Unterrichtsmanagement und meine Lernzielerfassung mit Apps wie SELAS zu unterstützen. Die Datenerfassung an anderen Testschulen fungiert hier lediglich als Vergleichswert um Voreingenommenheit meinerseits auszuschließen.

Durch die spezifische Ausrichtung meiner Studie ergeben sich daher nur für mich direkte Vorteile im Sinne einer Wissens- und Erfahrungsschatzerweiterung. Weder die [REDACTED] noch die anderen Schulen ziehen hieraus irgendwelche Vorteile. Auch für den Entwickler der App sind Vorteile allenfalls peripher und minimal, da es sich hierbei tatsächlich mehr um eine persönlich motivierte Forschung handelt.

#### Wie werde ich die gesammelten Daten schützen und inwiefern werden diese Daten geteilt?

Alle Daten, die ich während meiner Forschungsarbeit sammeln werde, werde ich auf meinem persönlichen, passwortgeschützten Laptop speichern. Dort werden diese nur für die Dauer des Projekts bleiben und mit Vollendung der Studie vernichtet. Zudem werden sämtliche Daten ausschließlich von mir genutzt und von meinen Korrektoren an der NHL Stenden University of Applied Sciences gelesen. In keinsten Weise werden während dieser Arbeit Namen oder Orte genannt und Andeutungen gemacht, die Rückschlüsse möglich machen könnten.

Alle Ergebnisse dieses Projekts werden im Rahmen meiner Bachelorarbeit und ausschließlich zu Universitätszwecken genutzt. Alle gesammelten Daten werden geheim gehalten und in einem passwortgeschützten Ordner bis zur Beendigung des Projekts gespeichert.

#### Sollten Fragen oder Ängste aufkommen, bitte kontaktieren Sie mich.

Für den Fall, dass zu irgendeinem Zeitpunkt Fragen aufkommen, bin ich wie folgt zu erreichen:

Name: Jessica Werner

E-Mail: [jessica.werner@student.stenden.com](mailto:jessica.werner@student.stenden.com)

(oder während meines Praktikums: [j.werner@the-ism.de](mailto:j.werner@the-ism.de))

## HOW DOES ASSESSMENT FOR LEARNING UNDERPIN PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM OF EDUCATIONAL APPLICATIONS, BE USED FOR ADDITIONAL SUPPORT?

### Appendix 3: Questionnaire for the teachers at school X

#### Supporting Assessment for Learning with ICT

A short questionnaire to investigate whether Elementary teachers at ISM make use of ICT to support assessment for learning.

**1. Do you have any experience with Assessment for Learning?**

*Markieren Sie nur ein Oval.*

☐ Yes

☐ No

**2. If yes, what is your experience with AfL?**

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**3. Do you think that ICT is beneficial for AfL?**

*Markieren Sie nur ein Oval.*

☐ Yes

☐ No

**4. What is your experience with supporting your teaching and the management of your students' progress through ICT?**

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**5. What kind of applications or websites do you use for AfL?**

*Wählen Sie alle zutreffenden Antworten aus.*

☐ SeeSaw

☐ Google Classroom

☐ Managebac

☐ Other

**6. Do you feel like these apps support your AfL (enough)?**

*Markieren Sie nur ein Oval.*

☐ Yes

☐ No

HOW DOES ASSESSMENT FOR LEARNING UNDERPIN PUPILS' PROGRESS AND HOW CAN ICT, IN THE FORM OF EDUCATIONAL APPLICATIONS, BE USED FOR ADDITIONAL SUPPORT?

Supporting Assessment for Learning with ICT

**7. What qualities would an App need to have in order to best support Assessment for Learning?**

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