Exploring Sint Maarten Primary School Teachers' Attitudes and Capabilities to Integrating ICT in the Classroom and Ensure a Lifelong Learning

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Abstract

The purpose of this study was to examine how primary school teachers on Sint Maarten participate in professional development activities to continuously develop and update their teaching skills in ICT. Data was collected through the analysis of policy documents and eleven semi-structured interviews. It was concluded that teachers who were highly motivated to participate in the professional development activities already use ICT regularly in the classroom. In contrast, despite available professional development training, some teachers did not feel competent or comfortable using ICT in the classroom. In addition to developing sufficient skills, this study also found that the necessary materials must be in place to facilitate the use of ICT in the classroom. For example, there often appears to be inadequate Internet connectivity and a lack of functioning hardware. This makes it difficult for teachers to use ICT effectively to prepare their students for the future challenges in this digital world. The recommendation, therefore, lies mainly in establishing an effective technological infrastructure and developing structured policy frameworks so that teachers can contribute the development of 21st-century skills of their students.

Keywords: ICT, professional development, teaching skills, 21st-century skills, primary school.

Samenvatting

Het doel van dit onderzoek was om te onderzoeken hoe basisschoolleerkrachten op Sint-Maarten deelnemen aan professionele ontwikkelingsactiviteiten om continu hun vaardigheden in het lesgeven middels ICT te ontwikkelen en bij te stellen. De data zijn verzameld middels de analyse van beleidsdocumenten en elf semigestructureerde interviews. De conclusie was dat leerkrachten die erg gemotiveerd waren om deel te nemen aan de professionele ontwikkelingsactiviteiten al regelmatig ICT gebruiken in de klas. Daarentegen voelen sommige leraren zich, ondanks de beschikbare professionele ontwikkelingstrainingen, niet bekwaam of op hun gemak bij het gebruik van ICT in de klas. Naast het ontwikkelen van voldoende vaardigheden is uit dit onderzoek ook gebleken dat de benodigde materialen aanwezig moeten zijn om het gebruik van ICT in de klas de vergemakkelijken. Zo blijkt er vaak sprake te zijn van een gebrekkige internetverbinding en een tekort aan goed functionerende hardware. Dit maakt het ingewikkeld voor leraren om ICT effectief te gebruiken en zo hun leerlingen voor te bereiden op de toekomstige uitdagingen in deze digitale wereld. De aanbeveling zit hem daarom met name in het opzetten van een effectieve technologische infrastructuur en het ontwikkelen van gestructureerde beleidskaders zodat leerkrachten kunnen bijdragen aan de ontwikkeling van de 21^e-eeuwse vaardigheden van hun leerlingen.

Sleutelwoorden: ICT, professionele ontwikkeling, onderwijsvaardigheden, 21^e-eeuwse vaardigheden, basisschool.

Exploring Sint Maarten Primary School Teachers' Attitudes and Capabilities to Integrating ICT in the Classroom and Ensure a Lifelong Learning

The rapid evolving of Information Communication Technology (ICT) has had a revolutionary impact on various aspects of our lives, including education (World Economic Forum & Asian Development Bank, 2017). Over time, there have been advancements in pedagogical approaches and teaching methods concerning the integration of ICT in the classroom. For example, STEAM education and e-learning are emerging methodologies (Soroko, 2020). To effectively integrate ICT in the classroom, teachers need to develop a new set of skills, attitudes, and professional conduct. These will enable teachers to assist students in mastering the skills necessary for success in the globalized world of the 21st-century.

However, these teaching methods were not part of the curriculum years ago when today's teachers completed their teaching degree. Currently, the situation of Staff Teacher Development in the Caribbean is characterized by insufficient ICT knowledge and skills (Pougatchev, 2007). This poses a significant barrier to effectively implement ICT in education, which indicates a need for additional training for teachers (Pougatchev, 2007). To ensure the provision of high-quality education to students, educators must continuously develop and update their teaching skills to meet the demands of modern education.

The central research question guiding this study is: "How do primary school teachers on Sint Maarten engage in professional development activities to continuously develop and update their teaching skills in ICT?". To make this research question more concrete, the following two sub-questions are derived from it: (1) "What are the existing professional development opportunities available for primary school teachers on Sint Maarten regarding the utilization of ICT?" and (2) "Which factors influence the involvement of primary school teachers in professional development activities related to the utilization of ICT on Sint Maarten?".

Background information

The mission of the Ministry of Education, Culture, Youth and Sports of Sint Maarten for the Education sector is to emphasize the need to prepare the students as lifelong learners, with the ability and equipment to deal with the challenges in this fast-changing world (Ministry of Education, Culture, Youth & Sports, 2011). However, as mentioned in personal communication with the Senior Policy Officer of the Department of Education at the Government of Sint Maarten, there is a gap in the professional development opportunities of in-service teachers, particularly those who obtained their teaching degrees decades ago. The

same challenging gap is mentioned during the "Regional Meeting of Ministers of Education of Latin America and the Caribbean" (UNESCO, 2017).

Furthermore, there is a lack of concrete implementation and documentation regarding the implementation of modern competencies, called 21st-century skills, into Sint Maarten's education system. Existing documents which do address this issue, are outdated and are lacking subsequent developments and updates. To address this gap and enhance the quality of education on Sint Maarten this thesis will focus on exploring ways to support teachers in their professional development. With this support, primary school teachers can be encouraged to continue to develop and update their teaching skills to optimize the quality of education on Sint Maarten.

Theoretical framework

Empowering the future of education

Rapid changes in the modern world have necessitated a shift in essential skills for success at work and in broader society. To maintain this success, a broader spectrum of competencies essential for navigating learning, communication, collaboration, and problem solving within digital contexts must now be integrated into school curricula (González-Salamanca et al., 2020). This broader spectrum of competencies related to digital contexts is also known as 21st-century skills. Leading organizations such as UNESCO and OECD have identified these 21st-century skills as essential and crucial to promoting sustainability in the knowledge needed in society's future (González-Salamanca et al., 2020). Within these skills, the focus is on the effective and critical use of ICT to deal with current and future challenges. Several educational trends have emerged in recent decades to incorporate 21st century skills into the education system. In 2008 for example, STEAM (science, technology, engineering, arts, and mathematics) education was introduced by American scholar Yakman (2008). This concept implies the integration of artistic and humanistic elements into the basic elements of interdisciplinary learning.

The role of the teacher

Since students of today are very dependent on technology, for teachers it is no longer enough to rely on their chalk and talk method of teaching in the classroom which they learned during their teaching degree decades ago (Lemley et al., 2014). Within the educational system, teachers are responsible for providing the best possible quality of education to optimize student learning, which now encompasses 21st-century skills as well. The fact that

experienced teachers lack knowledge about 21st-century highlights the need to educate them in this area, so they can effectively understand and teach these skills (Mirzajani et al., 2016).

Institutional support

The effectiveness and continuity in the professional development of teachers and educators is one of the key concerns of the Ministry of Education (Ministry of Education, Culture, Youth & Sports, 2011). The mission of the Ministry states that teachers must assume a new role in the classroom while teaching to be able to meet the demands of 21st-century education. These demands reflect the need to equip students with a broad set of skills and competencies that enable them to succeed in a dynamic and evolving global environment (Tight, 2020). This requires an overall organizational culture, created by the Ministry of Education, towards innovation and technology adoption with the necessitated resources. The availability of training programs for teachers and educational policies which promote ICT integration in classrooms can be seen as one of these necessitated resources.

Professional development opportunities for teachers

Since teachers do have a big influence on the developing of these 21st-century skills of their students, it is crucial that teachers are given the best opportunity to be able to improve their own professional skills (Ministry of Education, Culture, Youth & Sports, 2011). Recently, UNESCO (2017) has published the ICT Competency Framework for Teachers, which underscores the importance of providing technological trainings for teachers to become more competent in their professional development. Training teachers with ICT skills implies professionalizing their role and integrating essential professional competencies to optimize their professional performance (Michos & Hernández-Leo, 2020).

Existing literature already provides information about various training programs designed to enhance teachers' ICT proficiency, with development programs among these initiatives. According to Buabeng-Andoh (2012), teachers' professional development is a key factor in the effective integration of computers into classroom teaching. An (2018) examined the effects of a professional development course on the perceptions, attitudes, self-efficacy, and behavioural intentions of teachers regarding to the use of ICT in the classroom. The findings of this research indicate that this course had a significant impact on the perceptions, attitudes, and self-efficacy of teachers. In the literature, alternative methods for equipping teachers with necessary ICT knowledge can be found. For instance, according to Ertmer et al. (2012), modelling technology utilization for professional development could be a valuable approach to encouraging teachers to innovatively integrate technology in their classrooms.

Overall, these concepts are related to each other within the context of professional development opportunities for teachers to develop and update their ICT teaching skills. According to the literature, it seems like teachers enhance their ICT teaching skills through professional development activities which addresses 21st-century skills. This occurs for example via STEAM education to cope with the challenges of the 21st-century. This is in line with the institutional support of the Ministry of Education to enhance the quality of education on Sint Maarten.

Theoretical models of teacher professional development

As described above, the importance of teachers' professional development as a mean to improve schools, enhancing the quality of instruction, and improving students' academic achievement has been the subject of previous research (Day, 2002). The focus of the current research is on teachers' views about their own professional development. In recent years, efforts have been made on Sint Maarten to improve the effectiveness of teachers' professional development through school boards on Sint Maarten receiving funding for professional development (Ministry of Education, Culture, and Science, 2022). Given the current and rapid developments in ICT, professional development of teachers is more important than ever. First, many innovations and developments in the teacher's profession have been introduced in recent years, and second, it requires educational development because of the dynamic and ever-changing work environment (Martinez, 2022). All these have a direct impact on the teacher's mastery skills.

There are different views on professional development of teachers. The analysis of this study is informed by the model in which the conceptualization of professional development is related to personal growth (Avidov-Ungar, 2016). Here, personal growth refers to the desire to improve one's skills and resources to increase one's expertise in the field (Feiman-Nemser, 2001). This conceptualized form of professional development can also be used as a step in such a form of reform within education. Thus, in the case of rapid technological developments, professional development can teach teachers a certain repertoire of concepts in terms of ICT use in the classroom (Avidov-Ungar, 2016).

Methods

Research design

This study is based on mixed-method design that combined two qualitative methodologies, a document analysis and interviews. First, a small-scale qualitative study was conducted for this study. The attitudes and skills of twelve primary school teachers on Sint

Maarten were analysed through semi-structured interviews with open-ended questions. A larger sample size would have been unfeasible given the small number of approximately 750 teachers on the Dutch side of the island. In addition, given the length of the internship period, it was not possible to allocate more time to conduct the interviews.

To answer the research question, further insights were gained through the analysis of three policy reports from the Ministry of Education on Sint Maarten (2022) on obstacles and opportunities to improve education, a comparative analysis of Sint Maarten's Education (2023) and the MECYS 2016-2026 Strategic Plan (2015). In addition, three policy documents from UNESCO (2016), the United Nations (2021) and The World Bank (2013) were identified that are related to the research question. These documents were selected based on their relevance to the topic of ensuring lifelong learning and their significance in shaping opportunities for primary school teachers' participation in professional development activities.

Population

Participants were recruited within two school boards on Sint Maarten. Relevant interview questions for this study were adequately discussed with the participants from these two school boards. The sample consisted of five schools from which one to three teachers were interviewed. A total of twelve primary school teachers were interviewed, all of whom were female teachers. Two of the twelve participants were deputy school managers in addition to being licensed teachers at the time of interviewing.

Sampling and procedure

Through a list of primary schools on Sint Maarten obtained from the Ministry of Education, primary school teachers were selected through a purposive sampling approach. Through this route, efforts were made to select a diverse sample of teachers (Kelly, 2010). Data was collected from the participants' schools during March and April of 2024. All school boards and school managers were informed through an information letter (see appendix A). This letter introduced the researcher and explained the research purpose. Participants were allowed to withdraw from the study at any time without reason for withdrawal or any consequences. In addition, a consent form for participation was signed by the participating teacher (see appendix B). This form explained the participants' rights before, during and after the study. Eleven out of twelve participants gave permission for audio recording. The one case where there was no consent for audio recording, the researcher made detailed field notes during the interview that were not recorded on audio. The setting in which the interviews were conducted ranged from an empty classroom to a staff lounge. The duration of the interviews ranged from twenty to thirty minutes. The data was processed anonymously and

cannot be traced back to the teacher and are archived confidentially in accordance with the university guidelines for data management.

Methodological triangulation analysis was used to enhance the research by combining interviews and document analysis. This allowed cross-validation of the information obtained to gain a deeper understanding of the study.

The positionality of the researcher plays a crucial role in shaping the research process and results. As an educator with some experience in using ICT in the classroom, the researcher's insights and perspectives can influence the interpretation of data and the focus of analysis. Using reflexivity, own assumptions and perspectives are assessed to ensure a balanced and objective approach to the results.

Research instrument

Data was collected through eleven semi-structured interviews with primary school teachers in the field, given one of the interviews was conducted with two teachers at the same time. Two of the eleven interviews were conducted in Dutch (interview two and eleven), and the other nine in English. Whenever necessary, quotes used to illustrate the findings were translated from Dutch into English. The researcher developed an interview guide using relevant insights from the theoretical framework and personal insights. Semi-structured interviews allowed room for the interviewees and interviewer to go deeper into the predetermined topics (Boeije, 2010). The interviews were conducted in person because this provided the most natural conversational setting in which there was room for nonverbal communication and little room for miscommunication (Irvine et al., 2012).

The questions asked during the interview addressed general attitudes and experiences about ICT use and available opportunities to improve their ICT skills. The interviews began with demographic questions (n=4) and continued with the main interview questions (n=9) and their additional sub-questions (n=10) for further elaboration as needed. A sample question with the topic *the use of ICT* is: *What are your general attitudes towards the use of ICT in the classroom? Can you describe how you use ICT in the classroom?* The interview guide was refined with minor adjustments after the analyses of the first few interviews (see appendix C for the first version and appendix D for the final overview of the interview guide).

Analysis

Policy document analysis

Policy documents were analysed using a review process aimed at extracting key themes, trends, and policy implications relevant to the study. This analysis focused on

synthesizing the information in the documents to understand policy directions and priorities related to teacher professional development on Sint Maarten.

The main purpose of analyzing policy frameworks is to better understand implementation gaps. Within this analysis, it is crucial to understand why certain policies are not producing the expected results and what causes this. It is important to be able to assess whether this is due to a flaw in the implementation process, a mismatch between the policy and the context, or a lack of internal consistency within the policy (The World Bank, 2013).

The analysis was conducted based on Goal 4 (Quality Education) of the Sustainable Development Goals. This goal served to significantly increase the number of qualified primary school teachers, particularly in least developed countries and Small Island Developing states, through international cooperation for teacher training (Jurewicz & Yeldell, 2020). In addition, a combination of textual and comparative analysis techniques was used to delve deeper into the content and context of the documents. Moreover, the analysis emphasized the importance of ICT use in the classroom and paid particular attention to professional development programs for teachers.

Interview analysis

The qualitative data from the interviews were transcribed and analysed thematically to extract key themes and insights. A coding framework was created based on the theoretical concepts of the study. This served as the basis for analysing the data using the NVivo coding software. The interviews were then analysed using deductive thematic analysis supplemented by inductive thematic analysis. Thematical analysis is a method in which patterns (themes) can be identified, analysed, and reported (Braun & Clarke, 2006). Within this method of analysis, the patterns or themes can be identified in two primary ways: an inductive or 'bottom up' way or a deductive or 'top down' way (Braun & Clarke, 2006). In an inductive approach the themes are strongly linked to the data themselves. A deductive approach, on the other hand, is based on existing theoretical perspectives. In this way, the analysis goes beyond the obvious themes of the data (Braun & Clarke, 2006). The way the data are analysed corresponds to how and why you code the data. Since the research question in this data is based on theoretical concepts from the existing literature, a more deductive approach to coding was used.

Based on relevant literature (Buabeng-Andoh, 2012; Shafie et al., 2019; Esfijani & Zamani, 2020) and the research question, a codebook (see appendix H) was prepared prior to data analysis. The interviews were then analysed through the six steps of thematical analysis (Braun & Clarke, 2006): (1) *Familiarizing yourself with your data* via (re)reading and

recording initial thoughts. While reading the data, possible codes were noted, both codes that match the codebook and new additional codes (see appendix E). (2) *Generating initial codes*. The data was coded using the codebook and new additional codes. Codes that did not appear in the data were removed from the codebook, such as *changing attitudes toward the use of ICT*. The new additional codes were added to the codebook (see appendix F). (3) *Searching for themes* by combining codes into overarching themes. Five themes were modified from *attitudes toward the use of ICT* to *recommendations for improving integration of ICT*. In addition, some codes were grouped within another theme, such as *impact on students* grouped within the theme *use of ICT in classroom* (see appendix G). (4) *Reviewing themes*. Themes were checked in relation to the coded extracts. Some candidate themes did not seem like real themes, while others clashed with each other. The themes *positive experiences* and *negative experiences* were dropped under the theme *attitudes toward the integration of ICT*, and the codes *challenges ICT in classroom* and *solutions to challenges* were grouped within the theme *use and misuse of devices in primary education* (see appendix H). (5) *Defining and naming themes* by providing clear definitions and names for each theme (see appendix H). (6) *Producing the report* by linking back to the research question and relevant literature. The themes found are counted and illustrated by citations.

Results

General remarks on the findings of the analysis

Consistent with the findings from the document analysis of policy reports, there appears to be a gap in practice between teachers' needs to use ICT during teaching and the resources currently available. There seems to be a long way to go to ensure that all schools are ready for the future of technology.

During the interviews, teachers emphasized the benefits of using ICT in their lessons, but also expressed concerns about the challenges associated with using ICT. Similarly, school boards offer opportunities for professional development for in-service teachers. The provision for professional development appears to be on the upswing. However, deficiencies around the ICT infrastructure appear to be one of the primary causes of the problems around integrating ICT into primary education on Sint Maarten. For example, the interviews reveal that schools have outdated equipment and a poor Internet connection. This seems consistent with the findings based on the policy documents.

Findings from the policy analysis

This section presents findings from the analysis of policy documents. These documents relate to the existing professional development opportunities available to primary school teachers in the development of ICT skills to be used during teaching. First, documents will be analyzed with information on the role of the teacher in the Caribbean. Next, the shortcomings on Sint Maarten concerning the education system will be cited to then be able to make a connection to the themes addressed in this research.

Strategic plan in the Caribbean

The analysis of the UNESCO documents, show that to meet Goal 4, teachers must be motivated to use ICTs appropriately (UNESCO, 2016). Proposed strategies by UNESCO (2016) include equipping teachers with proficient technology skills to use ICT and social networks effectively and promoting media literacy and critical thinking skills. The 2022 to 2026 strategic plan for UN agencies, funds and programs in the English- and Dutch-speaking Caribbean is outlined in The United Nations Multi-Country Sustainable Development Cooperation Framework (United Nations, 2021). This framework is aimed at supporting the achievement of the SDGs and will define UN cooperation in the region over the next five years to support countries. In February 2022, the government of Sint Maarten endorsed this framework and demonstrated its commitment to work with the UN to address regional challenges.

Basic conditions for good education

Good education can be obtained if basic conditions are met. These basic conditions include the maintenance of school buildings, up-to-date teaching materials, as well as up-to-date ICT facilities and sufficiently qualified teachers. The analysis of the Division of Inspection document shows that education on Sint Maarten suffers from structural shortcomings in the basic conditions (Ministry of Education, Culture, and Science, 2022). These deficiencies in education continually hamper the education system and may prevent students from reaching their full potential. To solve this problem, professional development programs can be established. The analysis of the documents of the Division of Inspection (2022), show that school boards on Sint Maarten receive funding for professional development, including ICT. Yet, many schools have reported that they do not receive sufficient funding to invest in ICT resources (Ministry of Education, Culture, and Science, 2022). The analysis of this document shows also that the equipment in schools is often outdated, while the general infrastructure, including Internet connections and bandwidth, is also not up to date. In addition to a lack of up-to-date equipment and well-organized infrastructure, there is also a lack of necessary expertise. For example, schools sometimes

receive a smartboard, but teachers lack the necessary expertise to use the smartboard properly. This leads to situations where smartboards are used as whiteboards (Ministry of Education, Culture, and Science, 2022).

Technology & Education – ICT use in the classroom

The Internet has become widely accessible on Sint Maarten. Although the use of ICT and the Internet is increasingly being incorporated into educational institutions on Sint Maarten, they are not yet optimally integrated into the curriculum. In addition to the minimal amount of ICT, classrooms on Sint Maarten are predominantly print-based environments where textbooks, teacher manuals and other printed materials are used. Technology is a shared resource in education on Sint Maarten today (Ministry of Education, Culture, Youth & Sports, 2015). Given the rapid advances in technology, the future of education will be about access, learning and collaboration, both locally and globally. Sint Maarten will also have to begin to determine the extent to which it wants to embrace these technological advances. Right now, there is still a way to go to ensure that all schools are ready for the future of technology (Ministry of Education, Culture, Youth & Sports, 2015).

Professional Development Plan – A lifelong learning

The analysis of the 2022 budget document of the Ministry of ECYS, shows that efforts are currently underway to recruit and retrain teachers (Ministry of Education, Culture, Youth and Sports, 2023). This is made possible through the ongoing Professional Development Plan (PDP). Through the Professional Development Plan, primary and secondary school teachers will be provided with the necessary qualifications to legally teach on Sint Maarten, with the objective to achieve an appropriate skill level to provide quality instruction in education (Ministry of Education, Culture, Youth and Sports, 2021). In doing so, one of the sub-recommendations pays extra attention to training teachers through continuous professional development of education professionals (Ministry of Education, Culture, Youth and Sports, 2023). The MECYS 2016-2026 Strategic Plan focuses on building teacher capacity and continuous professional development of education professionals (Ministry of Education, Culture, Youth & Sports, 2015).

According to the MECYS Strategic Plan 2016-2026, the future of Sint Maarten depends heavily on the success of its education system. The analysis of the Strategic Plan shows the ministry's overarching challenges for the Education, Culture, Youth and Sports sectors. Challenges within the education sector particularly concern the effects of major technological changes and their influences on education on Sint Maarten. In this, the government should determine the extent to which they embrace technological developments.

This strategic plan outlines the identified priorities per sector. It then identifies the individual role of each stakeholder to achieve the priorities (Ministry of Education, Culture, Youth & Sports, 2015). Here, the Ministry of ECYS has the role as responsible for monitoring, reviewing and reforming current policies. This involves trying to match the performance of the ministry with the strategic ambitions for 2026. In addition, the role of the teacher will change given the rise of ICT use in education. Teaching and learning will become a social event in the coming years, with interaction being a key concept (Ministry of Education, Culture, Youth & Sports, 2015).

Findings from the interviews

In this section, the findings derived from interviews conducted with primary school teachers will be discussed. Based on the information acquired from the interviews, five themes were distilled from the data. These reflect the perspective of twelve primary school teachers on the attitudes and capabilities to integrate ICT in the classroom and the possibilities to participate in professional development activities. The following five themes were distilled being relevant to answering the research question: (1) Attitudes toward the use of ICT, (2) Use and misuse of devices in primary education, (3), Impact and educational outcomes for students, (4) Importance of lifelong learning and enhancing ICT skills, and (5) Infrastructural needs and teacher recommendations to improve the integration of ICT. The themes are discussed in detail below.

Attitudes toward the use of ICT

Beginning with attitudes toward ICT, seven teachers indicated positive attitudes toward ICT use in daily private practices. Of five teachers, it is unclear what their attitude toward ICT in daily life is. For example, these teachers indicated their attitudes toward ICT in the classroom but did not explicitly name the use of ICT in daily life. Three of the teachers described their negative attitudes toward ICT in daily life. For example, when asked about their experiences with the use of ICT in daily life, the following answer was given: "ICT is everything right now. We are now living in a new technological era. It's either you run with it, or you get left behind. Yeah. So, we are advancing so quickly. So, we have to" (teacher 1, school 1). All teachers described their positive attitudes toward ICT use in the classroom. One teacher (teacher 5, school 3) specifically indicated that her attitude toward ICT use in teaching had changed from her attitude when she had just graduated: "So my whole teaching perspective have changed from when I did my student teaching. At the time didn't have any technology in the classroom, so there was nothing."

For example, quotes show that students are more motivated, but use of ICT is also more efficient for teachers: "And students also find it little fun and interesting part, where in they can explore number of worksheets, examples, and different apps that we introduce them to. We find this learning more interesting" (teacher 3, school 1) and "It alleviates some of the stress some of the work, like I say, for example, for assessment I can easily drive upon assessment online, for example through quizzes" (teacher 6, school 3).

Some of the teachers indicated that colleagues sometimes have difficulty using ICT in the classroom. They describe resistance and little motivation for learning the skills needed to use ICT in the classroom: "Not everybody's flexible where technology is concerned. You know, we have different teachers with different preferences and there are some teachers who think that the use of technology brings a lot more stress than it does traditionally" (teacher 7, school 3).

Use and misuse of devices in primary education

The next theme is about primary school teachers' use of ICT in the classroom. Here teachers name programs and practices that they use to integrate ICT in their teaching. All interviewed teachers describe how they integrate ICT in their teaching, e.g., "I use ICT for teaching, so breaking down ideas so making things easier. So, using video. Sometimes our explanations via the Internet instead of just hearing my voice and also let them use to do research" (teacher 2, school 1). Teachers also mention different programs:

> I use it like that to reinforce. In terms of my lessons, I do make PowerPoints, so they
> love that. I do send that home. We use YouTube videos to watch. I use Kahoot. I use
> quizzes. I have a lot of different platforms that I use with students, so it's yeah, so
> daily. (teacher 5, school 3)

However, teachers also experience disadvantages of using ICT in the classroom. All but one teacher has experienced challenges when using ICT. The following quotes illustrate one of the three main challenges: "So, I'm like, is he going to remain focused on what he's doing? Is he going to try to divert from what exactly he's supposed to be?" (teacher 2, school, 1).

> And there was this particular student. She was on her tablet and her headphones were
> in. So, we're like, why is your headphone in? And when we checked, she was listening
> to explicit music on her tablet. OK, so those are some of the disadvantages that we are
> having. (teacher 1, school 1)

Besides the challenge of ensuring that students are doing their tasks rather than doing other things on their devices, two main challenges exist for teachers regarding the use of ICT in the classroom. For example, teachers find that the Internet connection is often flawed: "So we had like, the tablet, but the Internet connection was weak. So, you couldn't connect everybody at the same time" (teacher 6, school 3) and there is a lack of working devices present in school: "But if four, five, six, seven don't have it, then you're stuck with then you can't do that for a while. That's really a problem because we really don't have that many devices to borrow" (teacher 12, school 5).

On the other hand, all teachers also have their own solutions to cope with the challenges of ensuring that students are doing their tasks. For example, teacher 4, school 2 describes:

> So, I do have real agreements with parents about that. First time is a warning. Second time I take it in, parents have to come get it, and third time is actually a month ban on it, so then everything comes down on paper.

Another teacher described the following: "I'm not sure if because of me, you know, stern from day one the rules, because if I catch you, you're not allowed anymore" (teacher 8, school 4).

Impact and educational outcomes for students

In the third theme, teachers indicate the impact of using ICT in the classroom on their students. This includes motivation, concentration as well as student achievement. All teachers describe a positive impact on students, with gains in increasing student motivation when ICT is used. The following quotes illustrate this: "So, to me they're a lot more disciplined with the device" (teacher 2, school 1) and "So it's always a lot of excitement and eagerness surrounding ICT in the classroom from both educators and the students" (teacher 9, school 4).

Also, teachers sometimes adapt their teaching methods to specific needs of their students, two teachers indicate this. For example, teacher 7, school 3: "That's not his style of learning, but once I introduce the technology, he will take his time, go through the questions, read them multiple times".

Importance of lifelong learning and enhancing ICT skills

All teachers describe how they develop professionally. Several examples are mentioned here by the teachers. The following quote illustrates one of the examples:

> We have technology conferences as well. So, they come for example, they come with quizzes, and they teach you how to use. If you, you're, you become the student and

you engage in the game, and you come back to your classroom implemented. (teacher 5, school 2)

The impact of professional development programs was also discussed with teachers. The teachers describe that PDPs have a positive impact on their use of ICT in the classroom. The following quote from teacher 8, school 4 reflects this:

So then when you go to the training now, you say, oh, you can use it so then it encourages you to look for more than what you receive from the training and keep up to date because you know it changes.

The teachers indicate that their confidence and comfort in using ICT in the classroom has increased after participating in such a professional development activity. Professional development can be seen as an aspect of personal growth for teachers. For example, teacher 3, school 1 said the following about the increased level of self-confidence in using ICT:

This was motivated me to start with ICT in my class because I was new in the school so I thought I was not sure how will I go about with ICT user devices. But with that session I got the confidence to right away started and whatever was taught in that I started implementing right away. It motivated me to start using. And it gives you new, refreshes all your ideas. Those processes give a revision of what you already know.

Finally, teachers discuss the support they receive from school managers and school boards to be able to participate in professional development programs to improve their ICT skills. Teacher 11, school 5 for example, relates the following: "Yes, they had asked which teachers wanted to do that and I signed up. And yes, just took the training through school." All teachers also describe how they stay up to date regarding developments in ICT. The following quote illustrates an example:

I've subscribed to like so many different websites and and and blogs and podcasts and Facebook pages that are geared towards education. So, in that I would always get an e-mail popping up or something on my feed. And that would cause me to stay abreast with what is taking place in education. (teacher 9, school 4)

Infrastructural needs and teacher recommendations to improve the integration of ICT

While having a look at the recommendations, eight teachers make specific recommendations for improving the integration of ICT in education. For example, teacher 8, school 4 when asked by the interviewer if she has any recommendations answered the following:

> So, then you would need a computer teacher. So instead of the class teacher they can go like how they go to music or gym. They go to the computer lab and get more insight just in case they don't get it from the teacher. At least, you know they getting something?

Two teachers indicated that a special curriculum should be designed to skillfully integrate the use of ICT in the classroom. The following quote illustrates the thoughts behind this recommendation:

> I think if we start with a clear-cut curriculum because right now, we, our curriculum states you are teaching students about floppy disks and, you know, really outdated. So clear outline, even persons who do not know about ICT, would be able to say, OK, today I'm going to teach them how to open a program, how to, you know, this is if it's quizzes. (teacher 6, school 3)

Teachers on the one hand gave recommendations, on the other hand they also named some personal needs to integrate ICT more easily during their teaching. Eight teachers described that they suffer from poor Internet connectivity, including teacher 2, school 1: "They want to bring in this ICT and the use of this technology, but our Internet needs to be seriously upgraded". Seven teachers mention that they suffer from a lack of functioning devices including teacher 1, school, 1: "We don't have a device for everyone, so it would be great if everyone could get a device meaning school based". In most cases, these needs were particularly related to the ICT infrastructure. But according to the teachers, there is also a need for more training as teacher 6, school 3 mentions: "We have to choose to practice, you know. And if we don't choose to practice then, yeah. Then it remains a challenge." This quote describes the unwillingness of some teachers to participate in training and developing ICT skills to meet challenges while teaching through fear. The interviews show that this requires confidence and guts from inexperienced teachers, as can also be seen in the quote from

teacher 8, school 4: "so we first need to get teachers to be comfortable, you know, to come out of their comfort zone".

Policy insights and teacher perspectives

Based on the above findings, an answer can be given to the research question: How do primary school teachers on Sint Maarten engage in professional development activities to continuously develop and update their teaching skills in ICT? This study shows that primary school teachers on Sint Maarten engage in professional development activities in several ways to develop their ICT skills. For example, teachers use (mainly) obligated formal trainings organized by the school board as well as obligated trainings organized during study days by their school manager. In addition, teachers indicated that they take their own initiative to stay up to date with the latest technological educational trends using social media and educational platforms. This answers the first sub-question. Complementary and at the same time in response to sub-question two, this study highlights the urgency of a well-functioning technological infrastructure and structured policy frameworks to enable teachers to effectively participate in professional development activities. Remaining informed about the latest findings in ICT is essential for promoting effective teaching practices and supporting the continuous professional growth of teachers.

Discussion and conclusion

This study examined what attitudes and abilities teachers possess while using ICT in the classroom. In addition, the current professional development opportunities offered to teachers within different schools to further develop technological skills were examined. For example, teachers have a positive attitude towards the use of ICT, ICT is used by teachers in diverse ways and all of them also experience disadvantages to its use. The use of ICT in the classroom seems to contribute positively to students' motivation, teachers are offered sufficient opportunities for professional development, and the biggest problem while wanting to use ICT in the classroom seems to be the technological infrastructure. In line with findings from the analysis of policy documents, it was found that the education system on Sint Maarten needs to be restructured in view of global technological trends. Teachers indicated that ICT is everywhere these days, both in school and privately. Students need to be prepared for potential future challenges around technology. A common theme in the documents was the importance of strengthening teaching staff by providing them with the equipment to develop their technological skills. Teachers indicated the benefits they derive from professional development activities, like increased confidence and comfort in using ICT in the classroom.

In addition, the documents outlined specific frameworks to address implementation gaps. Teachers expressed the need for a clear curriculum to skillfully integrate the use of ICT in the classroom. In line with these findings, UNESCO and UN documents aligned the importance of strengthening the teaching profession through a policy framework, however, the Sint Maarten policy document lacks a specific framework to address the implementation gap. Relative to previous research, this study could conclude that establishing a specific framework can close the gap between policy and educational practice.

By describing how teachers engage in professional development and the systemic supports and barriers they face, it is possible to answer the research question. This research highlights the need for better technological infrastructure and more structured policy frameworks. In doing so, it highlights the gap between current practice and the ideal support teachers feel they need to develop and update their ICT skills continually and effectively.

From existing literature by UNESCO and OECD, among others, there appears to be a need for a shift in essential skills to sustain educational success in our modern society (González-Salamanca et al., 2020). For example, the research of González-Salamanca et al. (2020) shows that this need, given that teachers benefit from professional development programs that help them improve ICT skills, is essential for teaching 21st-century skills. Mirzajani et al. (2016) also indicates that there is a clear need to train teachers with the relevant knowledge to understand and teach these skills. This same need is prevalent among teachers on Sint Maarten's primary school.

In addition, the Ministry of Education (Ministry of Education, Culture, Youth & Sports, 2011) has set the mission for teachers to adopt new roles to meet the demands of 21st-century education. Given that teachers indicated that professional development and a well-functioning technology are essential to effectively integrate ICT, this mission requires an overall organizational culture focused on innovation and technology adoption with the necessary resources.

Having teachers train their ICT skills professionalizes their role and integrates essential professional competencies to optimize their performance (Michos & Hernández-Leo, 2020). Findings from this study show that professional development activities have a significant impact on teachers' perceptions, attitudes and self-efficacy which is in line with the literature (An, 2018) suggesting that such activities contribute to improving ICT teaching skills. Working from the model of professional development in relation to personal growth (Avidov-Ungar, 2016), this study highlights that personal development plays a crucial role in

teachers' attitudes and ability to integrate ICT. As teachers' self-confidence increases through PDPs, they will use ICT more easily and frequently while teaching.

Limitations and recommendations

To our knowledge, this study represents one of the first studies on attitudes and skills to integrate ICT in the classroom by primary school teachers on Sint Maarten. The lack of prior research in this area has also brought limitations to this study. For example, context-specific literature used is sometimes somewhat outdated or less applicable to this study because little research has been done on Sint Maarten within this topic.

One of the other limitations relates to the purposive sampling approach in obtaining the sample. Through this method, participants are purposefully selected, but may also result in limited representativeness of the findings. Because participants volunteered to participate in the interview on their own initiative, there is a risk that the sample may not be fully representative of the entire population. This sampling method attracted participants who were interested in ICT beforehand and whose teachers were therefore more likely to use ICT in their teaching. All this may give a superficial and incomplete picture of teachers' attitudes and experiences (Guest et al., 2017). Future research could benefit from using a larger and more diverse sample of teachers, through (stratified) random sampling, to represent all primary school teachers on Sint Maarten. Using this approach increases the external validity and generalizability of the study (Berndt, 2020).

Another limitation, the data collection process and subsequent analysis of this study focuses primarily on the perspective of the primary school teacher. Since the Ministry of Education wants to conduct research to substantiate a policy for professional licensing and ongoing professional development requirements of educational professionals in ICT, other stakeholders should be involved in further research. These other stakeholders include school managers, school boards and policy makers. The sample in this study included two school managers only by chance. However, these school managers were asked the same questions as the teachers. While this information provided a better picture of professionalization opportunities within these schools, more school managers should have been interviewed to draw general conclusions.

As a final limitation, there was some difficulty in contacting school managers to recruit primary school teachers to participate in the study. For instance, school managers did not respond to the researcher's recruitment email or did not provide participants. After sending follow-up emails, the minimum number of participants for this study was reached. In the end,

there were even more school managers who indicated they still had teachers who wanted to participate. However, there was not enough time left to conduct these interviews. For a follow-up study, more time could be taken to conduct the interviews. In addition, the researcher could switch more quickly to recruiting participants by telephone which will save time.

In addition to the findings and conclusions, there are recommendations for policymakers and directions for future research. The Sint Maarten government should develop structured policy frameworks so that teachers can contribute to the development of their students' 21st-century skills. It further recommends the establishment of an effective technological infrastructure. This includes budgeting for schools to update their hardware and improve Internet connectivity in schools.

Second, since the number of years of teaching experience was not considered during the recruitment of participants, it is difficult to determine whether there is a difference in attitudes between young and experienced teachers. For follow-up research, teachers could be selected based on years of experience. In this way a comparison can be made between the attitudes of these different target groups. Besides that, it could be the case that the older generations need differently tailored professional development programs compared to the younger generations which is important for policy makers.

In conclusion, this study identified the attitudes and capabilities of primary school teachers on Sint Maarten in the use of ICT in the classroom. The current study shows that the degree of mastery of ICT skills and a working technological infrastructure appear to play a key role in the attitudes of these teachers.

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Appendix A

Information letter to participants

Thank you for expressing your interest in this research. The purpose of this letter is to inform you about the study that you may choose to participate in. Please read this letter carefully, and if any questions arise do not hesitate to contact.

Research Title

Exploring Sint Maarten Primary School Teachers' Attitudes and Capabilities to Integrating ICT in the Classroom and Ensure a Lifelong Learning.

Researchers

This research is part of the Master study Youth, Education & Society (PID-track) at the University of Utrecht and in collaboration with the Ministry of Education of Sint Maarten.
Master Student: Nadia Schoemaker (nadia.schoemaker@sintmaartengov.org)
University Supervisor: Semiha Bekir (s.y.bekir@uu.nl)
Internship Supervisor: Erin Ellis (erin.ellis@sintmaartengov.org)
Further information about the master study is available at: Youth, Education and Society - Utrecht University (uu.nl)

Purpose of the study

The purpose of this study is to gain insight into the attitudes and capabilities of primary school teachers to integrate ICT in the classroom. This research attempts to gain insight into the existing development opportunities for teachers in the field of the use of ICT. The following research questions are supposed to be answered after this study:
"How do primary school teachers in Sint Maarten engage in professional development activities to continuously develop and update their teaching skills in ICT?"

To make this research question concreter, the following two sub-questions are derived from it:

1. "What are the existing professional development opportunities available for primary school teachers in Sint Maarten regarding the utilization of ICT?"

2. "Which factors influence the involvement of primary school teachers in professional development activities related to the utilization of ICT in Sint Maarten?".

Research Outline

To participate in this study, you will be asked to participate in a semi-structured one-on-one interview. This entails an interview of approximately 30 minutes with questions about your use of ICT, your attitude to use ICT and, regarding to professional development and the available support in ICT use. This interview will be planned in consultation at a time available to both of us. Preference will be given to an in-person interview (at your school) to reduce the chance of miscommunication. If this is not possible, the interview can also take place online. Participation is fully voluntary. You are free to withdraw at any time without the need to explanation or justification.

Confidentiality of Data Processing:

The results of this study are intended to complete the Master Youth, Education & Society. The interview data will be processed confidentially, and your responses will remain anonymous. The published results will be anonymous and not contain information that can not be traced back to you as a participant. A copy of the published results can be obtained if intended.

Questions

If you have any questions or concerns about this study, please do not hesitate to contact me via the following email address:
E-Mail: nadia.schoemaker@sintmaartengov.org

Thank you for your time and hopefully we will meet each other soon during the interview.

Best regards,
Nadia Schoemaker

Appendix B

Informed consent form

Thesis Research for the University of Utrecht – n.schoemaker1@students.uu.nl

Thank you for agreeing to participate in this study, which will take place in the months March and April of 2024. This form gives you information about the purpose of this study, a description of the involvement required and your rights as a participant.

The purpose of this study

- To gain insight into the attitudes and capabilities of primary school teachers to integrate ICT in the classroom.
- To gain insight into the existing development opportunities for teachers regarding the utilization of ICT.

The benefits of this study

- To gain a better understanding of the importance of ICT use in classrooms during the 21st century.
- To gain a better understanding of the importance of professional development activities to improve your ICT teaching skills.
- To set up recommendations for schools to offer professional development activities to improve the ICT teaching skills of teachers.

The methods that will be used

- One-on-one semi-structured interviews

You are encouraged to ask any questions that rise at any time before, during, or after the interview. Please contact me at any time via the e-mail address listed above. As a participant you can also contact my university supervisor via the following email address: s.y.bekir@uu.nl

Our interview will be audio taped to help me analyzing your insights. These tapes will only be heard by myself for the purpose of this study and will be deleted after being transcribed. These transcripts will be stored in secure university archive for ten years. Only me, my supervisor and members of the research team will have access. If you don't feel comfortable with recording at any time during the interview, you may ask me to turn off the recording. Direct quotes from you may be used in the thesis, your name and other identifying information will be kept anonymous.

Besides that, you have the right to withdraw from the study at any time. In the case of deciding to withdraw from the study, all obtained information will be destroyed and omitted from the study.

The insights gathered via this interview will be used to write a qualitative research thesis. This thesis will be read by my professor from the University of Utrecht and my internship supervisor from the Ministry of Education in Sint Maarten. Afterwards, the results will be presented by me in the Netherlands to peer students.

I, _____ confirm that I have read the procedure described above. By signing this form, I voluntarily agree to participate in the procedure.

I agree to:

1. Participation in the research   yes/no
2. Making audio recordings   yes/no

_____

(date of signing)

Appendix C

Draft interview guide

Possible interview questions to teachers:

Personal questions:

1. What is your age?
2. When did you get your teaching degree?
   a. For how many years do you have experience as a teacher?

Question regarding to ICT use:

1. What are your general attitudes toward the use of ICT in daily life?
2. What are your general attitudes towards the use of ICT in the classroom?
   a. Can you describe how you use ICT in the classroom?
   b. What impact does it have on the students in the classroom?
3. How do you use ICT in the classroom?
   a. E.g. STEAM education.
4. Can you describe a positive experience about the use of ICT in the classroom?
   a. How did it feel?
   b. What are the benefits of ICT use?
5. Can you describe a negative experience about the use of ICT in the classroom?
   a. How did it feel?
   b. What are the challenges of ICT use?
      i. How can these challenges be solved according to you as a teacher?

Question regarding the attitude to ICT use:

1. Did your attitude towards ICT use in the classroom change over time?

Question regarding to professional development and the available support in ICT use:

1. Have you received any training or professional development training about the use of ICT in the classroom?
   a. If yes, how did it look like?
   b. Did they influence your way of teaching and frequence of ICT use?
2. Do you currently engage in professional development activities to improve your teaching skills about the use of ICT in the classroom?

3. How do you stay updated with the latest educational trends and technologies?

4. Do you have any recommendations for improving the integration of ICT in the classroom?

    a. If yes, how should the support look like for you?

5. What do you need to (easier) integrate ICT in the classroom?

Appendix D

Final interview guide

Possible interview questions to teachers:

Personal questions:

3. What is your age?
4. When did you get your teaching degree?
    a. For how many years do you have experience as a teacher?
5. Which grade are you teaching?

Question regarding to ICT use:

6. What are your general attitudes toward the use of ICT in daily life?
7. What are your general attitudes towards the use of ICT in the classroom?
    a. Can you describe how you use ICT in the classroom?
    b. What impact does it have on the students in the classroom?
8. Can you describe a positive experience about the use of ICT in the classroom?
    a. How did it feel?
    b. What are the benefits of ICT use?
9. Can you describe a negative experience about the use of ICT in the classroom?
    a. How did it feel?
    b. What are the challenges of ICT use?
        i. How can these challenges be solved according to you as a teacher?

Question regarding to professional development and the available support in ICT use:

6. Have you received any training or professional development training about the use of ICT in the classroom?
    a. If yes, how did it look like?
    b. Did they influence your way of teaching and frequence of ICT use?
7. Do you currently engage in professional development activities to improve your teaching skills about the use of ICT in the classroom?
8. How do you stay updated with the latest educational trends and technologies?
9. Do you have any recommendations for improving the integration of ICT in the classroom?
    a. If yes, how should the support look like for you?

10. What do you need to (easier) integrate ICT in the classroom?

Appendix E

Draft codebook

Identifying important themes which are relevant to the research:

1. Personal information
   - Age
   - Years of obtaining teaching degree
   - Years of teaching experience
2. Attitudes toward the use of ICT
   - Attitudes in daily life
   - Attitudes in teaching
3. Use of ICT in the classroom
   - Description of ICT use
   - Impact on students
   - Specific programs
4. Positive experiences
   - Positive feelings
   - Benefits
5. Negative experiences
   - Negative feelings
   - Challenges
     o Solutions to challenges
6. Changing attitudes toward ICT use
   - Changes over time
7. Professional development activities and support in ICT use
   - Formal trainings
     o Description of the training
     o Influence of the training
   - Current engagement in PD.
   - Methods for staying up to date with ICT trends
   - Recommendations for improving integration of ICT
   - Needs for easier integration of ICT

Appendix F

Codebook after generating initial codes

Identifying important themes which are relevant to the research:

1. Personal information
   - Age
   - Grade teaching
   - Years of obtaining teaching degree
   - Years of teaching experience
2. Attitudes toward the use of ICT
   - Attitudes in daily life
3. Use of ICT in the classroom
   - Description of ICT use
   - Impact on students
   - Specific programs
4. Advantages of ICT use
   - Positive feelings
   - Benefits
5. Disadvantages and challenges in ICT use
   - Negative feelings
   - Challenges
     o Solutions to challenges
6. Professional development activities and support in ICT use
   - Formal trainings
     o Description of the training
     o Impact of PD
   - Current engagement in PD.
   - Methods for staying up to date with ICT trends
7. Recommendations for improving integration of ICT
   - Needs for easier integration of ICT

Appendix G

Codebook after searching for themes

Identifying important themes which are relevant to the research:

1. Personal information
   - Age
   - Grade
   - Teaching degree
   - Teaching experience
2. Attitudes ICT daily life
   - Negative attitudes ICT daily life
   - Positive attitudes ICT daily life
3. Attitudes ICT classroom
   - Negative attitudes ICT classroom
   - Positive attitudes ICT classroom
4. Use of ICT in classroom
   - Examples of programs
   - Impact on students
5. Advantages of ICT use
   - Positive feelings
   - Benefits
6. Disadvantages and challenges in ICT use
   - Negative feelings
   - Challenges ICT in classroom
     - o Solutions to challenges
7. Professional development activities and support in ICT use
   - Formal trainings
     - o Example PD
     - o Impact of PD
     - o Current engagement in PD.
   - Methods for staying up to date with ICT trends
8. Recommendations to improve ICT integration
   - Needs for ICT integration

Appendix H

Final codebook

Reviewing themes & defining and naming themes:

1. Attitudes toward the use of ICT
   - Attitudes ICT daily life
     o Negative attitudes ICT daily life
     o Positive attitudes ICT daily life
   - Attitudes ICT classroom
     o Negative attitudes ICT classroom
     o Positive attitudes ICT classroom
2. Use and misuse of devices in primary education
   - Use of ICT in the classroom
   - Challenges ICT in classroom
     o Solutions for challenges
3. Impact and educational outcomes for students
   - Impact on students
4. Importance of lifelong learning and enhancing ICT skills
   - Example PD
   - Impact of PD
   - Professional development and support
   - Staying up to date with ICT
5. Infrastructural needs and teacher recommendations to improve the integration of ICT
   - Needs for ICT integration
   - Recommendations to improve ICT integration

Sub-category:

6. Personal information
   - Age
   - Grade
   - Teaching degree
   - Teaching experience