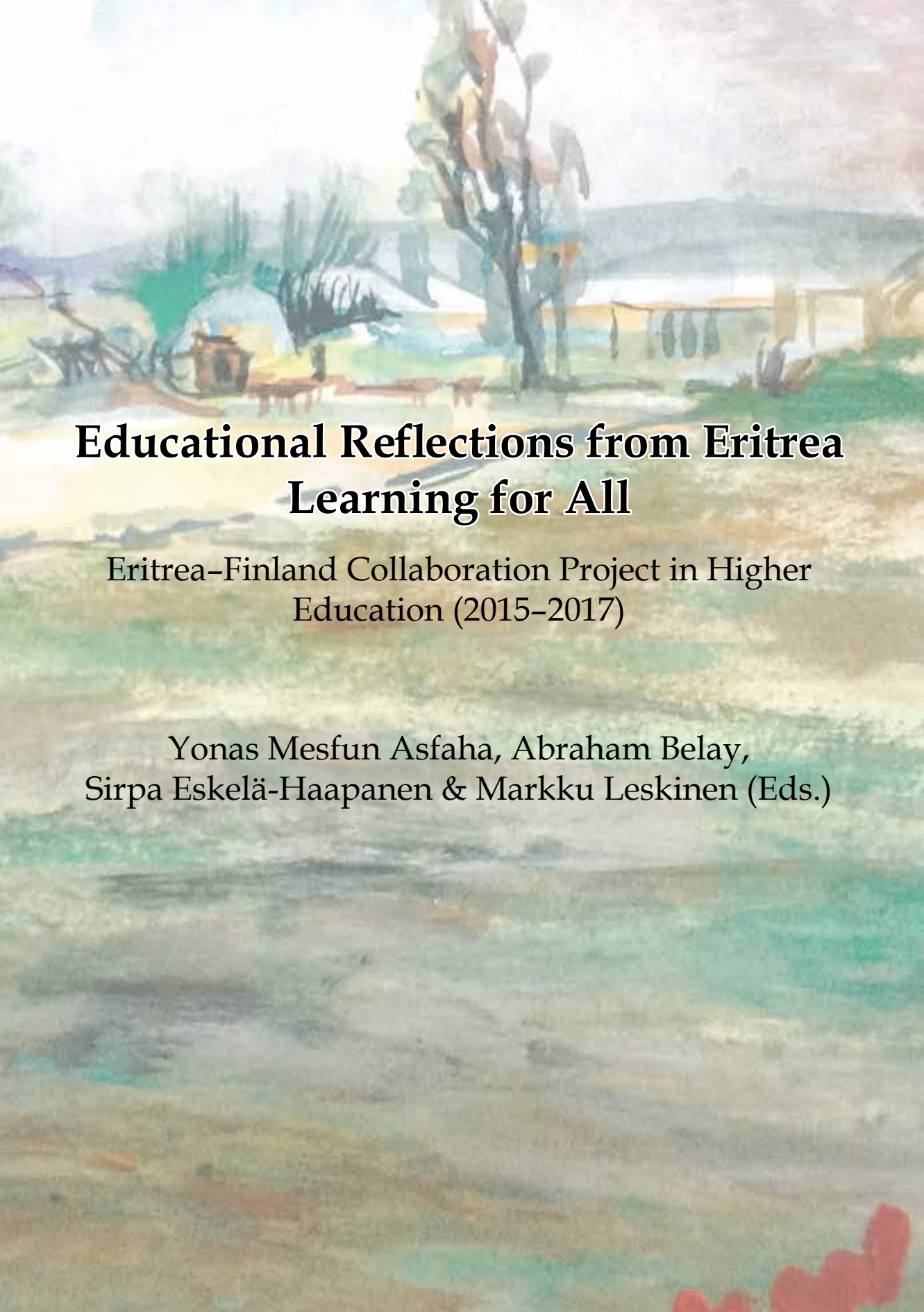

Educational Reflections from Eritrea
Learning for All

Eritrea–Finland Collaboration Project in Higher Education (2015–2017)

Yonas Mesfun Asfaha, Abraham Belay,
Sirpa Eskelä-Haapanen & Markku Leskinen (Eds.)

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Preface

This book is the outcome of an Eritrea-Finland collaboration project on building capacity in institutions of higher education (IHE) in Eritrea. The Eritrea Learning for All (ELFA) project, one of five IHE projects, was aimed at building the professional and research capacity of staff at the College of Education of the Eritrea Institute of Technology (EIT), Asmara Community College of Education (ACCE) and Eritrea Ministry of Education (MOE). To achieve this goal, the project delivered capacity-building modules with the help of Eritrean and Finnish experts in different fields.

This volume contains original research papers from the participants of the eight capacity-building modules implemented through different instructional modes, such as intensive workshops, distance learning and independent work conducted by the participants and realised in pre- and post-workshop assignments, readings and written reflections. The last of these capacity-building modules was on research methodology, including the design, implementation or fieldwork, analysis and reporting of research projects. The following chapters are the reports of these research exercises whereby the participants of the modules formed groups and conducted fieldwork, collected data, and analysed and reported on these in the format of the articles presented in this book

The school system in Eritrea comprises two years of pre-school, five years of primary school, three years of middle school and four years of secondary school. Successful completion of secondary school and satisfactory results in the Eritrean Secondary Education Certificate Examinations allow candidates to continue their tertiary education in one of the seven IHE in the country. Outside these formal channels, the MOE provides adult education programmes and complementary elementary education for out-of-school children (over school age). Public and private vocational centres provide various programmes of training in diverse fields.

Some of the major challenges facing schools in Eritrea are high dropout rates and low learning outcomes. Although enrolment rates have steadily increased over the years, dropout rates have reached between 5–7% in primary schools. Many of the possible reasons for this remain understudied; the possibility of unidentified learning difficulties among children and the low acceptability among school communities of some of the home language or 'mother tongue' programmes and the effect of these on enrolment and dropout needs further attention. Another closely related problem is the low learning achievement results reported by a number of surveys, such as the Monitoring Learning Achievements and the National Reading Survey, sponsored by the MOE.

The key to facing these and other challenges in education at all levels in Eritrea was believed to be teachers and teacher education. The ELFA project attempted to contribute towards building the capacity of teacher education in the country by providing professional support and training to staff from different institutions.

Established and implemented in 2015, ELFA is a Higher Education Institutional Cooperation project between EIT and the University of Jyväskylä (JYU). The project is funded by the Ministry for Foreign Affairs of Finland. The Finnish National Board of Education coordinates it under The Eritrea Specific HEI ICI Programme (Higher Education Institutions Institutional Cooperation Instrument). The project will run up to the end of 2017.

The overall objective of ELFA is to provide support for advanced professional development of the academic teaching staff at the College of Education (COE), ACCE and MOE. Over 60 participants, of whom 10 were female, participated in different activities in the two-year life of the project.

A number of capacity-building modules were provided to develop the professional capacity of the staff involved in teacher education at COE, ACCE and MOE. The modules in the ELFA project were designed to equip the participating staff with the most current and relevant knowledge and practices required for teacher education and development in Eritrea by following a research-based teacher education model. Different assignments, such as pre-workshop assignments, self-reflection papers, and learning logs and research plans, were provided to strengthen the capacities of the participants.

The different modules were designed and delivered with the help of local and Finnish experts who provided workshops on key thematic capacity-development areas, and were followed up with participants' assignments, reflections, research plans, and article drafts. The eight capacity-development modules offered were: Research methodology; Teacher education, pedagogy and curriculum development; Literacy research and instruction; Numeracy research and instruction; Learning difficulties; Educational leadership; ICT in education; and Co-creation of learning materials.

Based on the teaching experiences within the ELFA modules and the research plans that were submitted by the participants and evaluated by JYU experts, it was clear that the participants needed additional support in the research methods before they could embark on individual data collection. Additionally, there was a lack of standardised tests to assess the basic literacy and numeracy skills of the school children. Moreover, there was now limited time to wrap up the last few modules before the end of the project. Considering the above constraints and in line with the core objectives of ELFA, a pilot research was developed aimed at supporting the participants by enhancing their capacity in research methods, i.e. data collection, data analysis, and academic writing and publishing. The emphasis was on con-

ducting a manageable field research that would still provide opportunities for the participants to exercise their research skills within a collaborative perspective.

The proposed pilot research had several thematic areas under which each of the participants was grouped to conduct research and write an academic report. These thematic areas were: parental involvement and support; pedagogy of teacher education; educational leadership and management; technology (ICT) in education; literacy research and instruction; numeracy research and instruction; and understanding and managing learning difficulties.

Five elementary schools in Asmara and one teacher training institute were selected for data collection. The respondents in the data collection were pupils of grades 1 and 5, and their teachers and parents. Other participants were the directors of the elementary schools. In addition, the technology in education module participants explored pedagogies related to ICT in education for pre-service teachers at ACCE. The research design employed various tools, such as questionnaire surveys of the teachers, student teachers, parents and educational leaders, focus group discussions, as well as assessments of first and fifth grade pupils' literacy and numeracy skills.

The original design of the last of the modules in the capacity-building project was targeted at developing literacy, numeracy and learning difficulty assessment tools based on a pilot of the instruments developed in consultation with Finnish experts. The plan was to prepare a handbook containing assessment tools, teaching materials for the COE and eLearning materials adapted from Finnish software to local languages. In light of the felt need for further research training and the time limitations, the revised project plan aimed to engage participants in practical research design, implementation and report writing.

At each stage of the data collection, analysis and report writing, the participants of the capacity-building modules worked in collaboration with local and international experts. To enhance learning and collaborative engagement, a number of workshops were held with local and Finnish experts at different stages of the research process. Around 60–80 participants, local and international experts took part in the workshops during the design and appraisal of the instruments, before fieldwork in schools, in the selection of angles or topics to adequately exploit the collected data, and during the report writing and revising processes.

Periodic and intensive meetings helped with the adaptation of the instruments by local experts and module participants, e.g. translating the questionnaire into Tigrigna, reformulating prepared or translated instruments, etc. In order to take advantage of the huge amount of quantitative data gathered, expert statistical help from a statistician was sought. To ensure

the quality of the written reports, which constitute the chapters of this volume, the participants carried out group consultations, and before submitting their manuscripts, reviewed the revisions made after at least two reviews by local and international experts.

Data was collected using the following instruments: Grade 1 Tigriga Comprehension; Grade 1 Tigrigna Pseudoword Spelling; Grade 5 Tigrigna Comprehension (Narrative passage); Grade 5 Tigrigna Comprehension (Expository passage); Grade 1 Numeracy; Grade 5 Numeracy; Grade 5 Student Engagement; Parents' Questionnaire; Teachers' Questionnaire; School Administration Questionnaire; and ICT in Teacher Education questionnaire.

Both Eritrean and Finnish experts collaborated on preparing the instruments in the research. Some of the instruments were prepared in English and others in Tigrigna. As most of the instruments were finally administered in Tigrigna, there was a substantial amount of work to translate and adapt the English instruments into Tigrigna. This was carried out by focal participants in the research groups. The Grade 1 Comprehension, the Student Engagement and Parent Questionnaire were translated into Tigrigna and refined through discussions with participants in the project. Some were prepared in Tigrigna and administered in Tigrigna. The Grade 1 Pseudoword Spelling test and the Grade 5 Comprehension instrument were prepared in Tigrigna.

The schools deliberately selected for this pilot research were all located in the centre of Asmara. This was done to save time as all the participants from the capacity-building modules were conducting the fieldwork while fulfilling their teaching and office responsibilities in their respective institutions. The schools were Dahlak, Lalimba, Mai Tesfa, Model, and Medeber elementary schools.

The school-based student assessments were conducted by the teachers and focal persons in the capacity-building modules or research projects in collaboration with the teachers, while school administrations mainly did school administration interviews during regular working days of the week. The parent questionnaires were administered by hired research assistants and by inviting parents to come to the schools during the weekend. The ICT focal participant conducted a questionnaire on ICT use in teacher preparation at ACCE.

In a one-week workshop in May 2017, in which all the Finnish experts, their local counterparts, and the participants of all the modules participated, preliminary results of the data analysis were presented. Groups had already been formed around general research topics, and with the help of Finnish and local experts, each group laid down the first draft of their research plan by writing a tentative title, research questions, keywords and the data to be used. Analysis methods were also considered. The teams were encouraged

to create this using a visual mind map. The writing process continued for several months with support from local and Finnish experts. The articles were finalised in writers' and editors' group discussions during a one-week visit to Eritrea by two experts in October 2017.

The book contains eight chapters divided into four sections. The first section deals with the general educational system in Eritrea, and furthermore, the educational system and governance to support literacy and numeracy acquisition. The second section deals with the assessment of foundation skills such as spelling, reading comprehension, and number sense, and additionally, possible learning difficulties. The third section of the book focuses on examining the interaction between parents and teachers when supporting students' learning processes. Finally, at the end of the book, the role of ICT in teacher training is explored. The chapters partially repeat methodology descriptions to allow reading the content in any order of interest.

In Asmara and in Jyväskylä 17.11.2017

Editors

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List of abbreviations

ACCE	Asmara Community College of Education, Eritrea
B	Regression coefficient
COE	College of Education of the Eritrea Institute of Technology
Df	Degrees of freedom
EIT	Eritrea Institute of Technology
ELFA	Eritrea Learning For All (project title)
Exp(B)	Odds ratio (logistic regression analysis result)
HEI ICI	Higher Education Institutions Institutional Cooperation Instrument
JYU	University of Jyväskylä, Finland
KR-20	Kuder–Richardson reliability coefficient for binary variables
M	Mean
MD	Median
MOE	Ministry of Education, Eritrea
p	p-value (statistical test significance)
SD	Standard deviation
S.E.	Standard error
Wald	Wald's χ^2 test result

Educational system in Eritrea

Educational system and its governance to support literacy and numeracy in Eritrea

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Abstract

The aim is of this chapter is to provide a general presentation of the Eritrean educational system and its governance as an overall framework for the chapters dealing with literacy and numeracy in more detail. The chapter begins with an introduction, probing into the role of school leadership to justify the educational leadership scope on literacy and numeracy. This is followed by a brief description of the Eritrean educational system and its governance based on the corresponding education policy documents in Eritrea. The main part of the chapter focuses on Eritrean school directors' views on the educational system and its governance at the school level as reported by them in a survey to a sample of school directors in the Central Region (Asmara and its vicinity). In this examination, too, literacy and numeracy are a central standpoint.

Key words: elementary education, secondary education, governance, leadership, Eritrea

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Introduction

Today, school leadership is becoming a global educational policy priority due to the belief that it plays a key role in improving school outcomes and students' achievements by creating a conducive school environment and enhancing teachers' professional development in the world of globalisation (Pont, Nusche, & Moorman, 2004). It is widely advocated by researchers in the field that effective and efficient leadership plays a vital role in narrowing the gaps between low-performing and high-performing schools and, thereby, enhances the performance of all students. For this reason, Leithwood, Louis, Anderson and Walhlstrom (2004) considered leadership as second only to classroom instruction compared to all factors that contribute to what students learn at school. Furthermore, the Wallace Foundation (2006, p. 2) asserted that 99% of the superintendents who participated in the national survey by Leithwood et al. (2004) agreed that behind every great school there is a great principal. In addition, in the same study, nearly eight out of 10 superintendents believed that the first and most essential step to turn around a troubled school is to find a strong and talented leader to lead it.

However, the roles played by school directors are complex to clearly define and understand. Their role depends on the dynamics of the environment in which they work and the complexity of the challenges faced by globalisation; thus, MacNeill, Cavanagh and Silcox (2005, p. 1) called this 'a chameleon-like quality'. To this end, Pont et al. (2004) affirmed that in many countries, there is a lack of clarity about the core tasks to which school leaders should dedicate their time.

Nevertheless, based on Leithwood et al. (2004), Pont et al. (2004), Pont, Nusche and Hopkins (2008) as well as Alava, Halttunen and Risku (2012), we can identify the following four broad groups of interrelated school leadership roles. They are: setting a direction by developing a consensus around vision, goals and direction; helping individual teachers through support, modelling and supervision; redesigning the organisation to foster collaboration and engage families and the community; and managing the organisation by strategically allocating resources and support. In a similar fashion, the Wallace Foundation (2011) identified five key functions of principal leadership: shaping a vision of academic success for all students; creating a hospitable school climate; cultivating leadership; managing people, data and processes; and improving instruction.

Based on the above, we conducted an empirical research to explore the educational system and its governance at the school level as an overall framework for the chapters dealing with literacy and numeracy in more detail. The research examined Eritrean school directors' views on the educational system and its governance at the school level as reported by them in a survey to a sample of school directors in the Central Region (Asmara and its vicinity).

Educational system and its governance to support literacy and numeracy in Eritrea

The essential policy documents on the Eritrean educational system and its governance present this in the following manner.

The Government of Eritrea considers education the cornerstone for the overall and sustainable development of the nation. In addition, it realises that the formation of all-rounded human capital is the pre-requisite for effective socio-economic and political growth. Furthermore, it considers education one of the pillars of development and a human right for all Eritrean citizens. To fulfil these bases for sound and sustainable human resource development and to promote literacy and numeracy in order to ensure lifelong learning, the Eritrean Ministry of Education (MOE) has adopted a three-band structure. This consists of basic education, secondary education, and further and higher education. The structure also allows for combinations of formal and non-formal education, as well as moving between formal and non-formal education (MOE, 2009a).

At the elementary school level (grades 1–5), the curriculum is delivered in the mother tongue, whereas in the middle school level and above, English is the medium of education. Education is primarily the responsibility of the government and it is free at all levels, including tertiary education. Basic education (grades 1–8) is compulsory for all school-age children (MOE, 2003).

According to the Eritrea Basic Education Statistics (MOE, 2014), the overwhelming majority (91.5%) of the schools are run by the Government, whereas the remaining 8.5% are owned by non-governmental organisations representing specific missions and communities, such as the Awkaf (Muslim Community Institution), or private schools. The MOE monitors the schools, and a regulatory body compiles a centralised curriculum and administers four main tasks. These are policy formulation, human resource development and management, research, and regulatory and standard setting.

At the Ministry level, five departments are responsible for monitoring and implementing the main tasks of the MOE. For the actual implementation of the MOE's policy and guidelines, each of the six Regional Education Offices have their own sub-region education office and representatives, including the school level. The Regional Education Offices are administratively under the Regional Administration Offices, which are responsible for both regional and local governance. All of these are professionally responsible for the MOE (2009b).

At the school level, there is a system of community participation through the Parent, Teachers and Students Association (PTSA). Every school forms

its own PTSA comprised of democratically elected members from parents, teachers and students. The mandate of the PTSA is mainly to participate in the work for the school development plan, to regulate students' discipline and to manage financial issues. Complementing the role of the school director and his/her support staff is a supervision system that stretches itself from the Ministry to the sub-regional level. Its main aim is to regulate, standardise and give support to teachers and the school administration (MOE, 2008).

Educational system and its governance on the school level to support literacy and numeracy

To examine how the Eritrean educational system and its governance manifested itself at the school level and particularly how the manifestations supported literacy and numeracy, we investigated the opinions and views of elementary, junior and secondary school directors. The study focused on five school leadership themes: characteristics and roles of school directors and sustainable school leadership; quality and effectiveness of education; school directors as pedagogical leaders and teacher leadership; parental involvement; and school culture. The themes were determined based on the expertise and interests of the Eritrean research team, taking into consideration the overall literacy and numeracy goals of the ELFA Project.

Methods

The survey employed a descriptive research design that embraces both qualitative and quantitative approaches. In social science studies, making specific predictions, narrating facts and characteristics concerning individuals, groups or situations, is possible through a descriptive research design (Kothari, 2004). Moreover, it allows for a rapid turnaround during data collection (Creswell, 2009).

The determined five school leadership themes were transformed into a survey. This phase was supported by questionnaires, which had been applied by the Institute of Educational Leadership, University of Jyväskylä to examine educational leadership at the municipal and school levels in Finland (e.g., Kanervio, & Risku, 2009; Risku, Kanervio, & Pulkkinen, 2014, 2016; Risku & Pulkkinen, 2016). These, in turn, had been contextualised from the questionnaires applied by the School Superintendents Association, the National Association of Elementary School Principals and the National Association of Secondary School Principals in the United States of America (USA).

The semi-structured questionnaire was first compiled in English. The final questionnaire included 53 questions comprising both multiple choice ones

mostly using a 4-point Likert scale and open-ended ones. The 4-point Likert-scale questionnaire ranged from 'not at all' to 'very much'. To make it easy for the participants and to minimise potential misunderstandings, the final questionnaire was translated into the local Tigrigna language before it was disbursed to the participants.

A sample size of 37 school directors was selected through non-probability sampling techniques (purposive sampling) from a target population of 146 elementary, middle and secondary schools in the Central Region (Asmara and its vicinity) called Zoba Maekel. The total number of school directors who were invited to participate in the survey in terms of gender were 32 (86.5%) males and 5 (13.5%) females.

The researchers disseminated the questionnaires to each school director in the selected schools and instructed both them and the sub-Zoba officers on how to fill-out the questionnaires. Assistant data collectors collected the answers five days after the disseminations. All the distributed questionnaires were returned on time except for three missed papers. Thus, the return rate was 91.9%.

The data collected through questionnaires were coded and analysed using the statistical package for social sciences (SPSS version 22.0). The study applied descriptive analysis calculating frequencies and proportions for the quantitative data. These findings were presented in the form of tables and graphs. The qualitative data from the open-ended questions were categorised and analysed according to themes to complement the quantitative data.

Of the 34 participants who answered the survey, 76.5% represented public schools, 11.8% mission schools, 5.9% community schools and 2.9% private schools, corresponding well to the general distribution of the various school types in Zoba Maekel. In addition, each of the seven sub-regions in Zoba Maekel had almost the same 14.3% representation in the final data.

Concerning highest academic qualification of the respondents, approximately 67.6% had completed grades 12+1 to 12+3. School directors with an academic degree qualification (grades 12+4) comprised 26.5% of the survey participants. Only 2.9% had a master's degree (grades 12+6). From the total respondents, 11.8% did not have any professional training in leadership. Furthermore, only 14.7% of the participants had a degree in leadership. In total, 44.1% of the respondents had less than 15 years of work experience as subject teachers and only 2.9% had more than 40 years. Furthermore, 67.6% had less than 10 years of experience as school leaders and 14.7% more than 21 years.

Results and discussion

School director's roles, characteristics and sustainable leadership

The results of the survey revealed that almost all of the school directors were of the opinion that good learning outcomes (100%), managing staff (98%), administrative management (97%), pedagogical leadership (94%), taking into account students' special needs (91.2%), working with parents (91.2%), and societal outcomes (91.2%) were among the roles they considered quite important or very important to their work. This result is consistent with the findings of Day and Sammons (2016), who assert that a clear vision and a sense of direction, leading learning and teaching, working with others, managing the organisation and strengthening the community are as key roles for effective head teachers in England.

In most cases, knowing something and doing it practically may not be aligned. Thus, the school directors were asked to give their opinion on how often they carried out the above tasks so that we could assess whether the school directors' priorities and practices were the same. The findings clearly showed that there was congruency between their priorities and practices. The responses that they rated as tasks performed quite or very often included pedagogical leadership (100%), administrative leadership (94.1%), managing staff (91.2%), good learning outcomes (100%) and taking into account students' special needs (100%). Good societal outcome (85.3%) and working with parents (85.3%) were the tasks with the lowest percentiles for these frequencies. It is possible here to align the results with the findings of Harris (2008), who asserted that effective school leaders largely share the same set of characteristics, including a strong vision, high expectations, clarity of purpose, drive and determination, and a relentless focus on teaching and learning.

The respondents were also asked to describe their autonomy in their work. About 91.2% of the school directors replied that they have 'very much' or 'quite a lot' of autonomy. Therefore, it is possible to conclude that Zoba Maekel school directors have autonomy in their work to effectively and efficiently perform their tasks as asserted by the OECD (2008), according to which school leaders with autonomy can have the capacity, motivation and support to improve teaching and learning.

The school directors noted that they made 'very much' or 'quite a lot' of effort to establish shared visions and values (94.1%), to create school culture (97.1%), to construct enabling environments (97.1%), as well as to enable participative decision-making (97.1%) and staff building (88.3%). Many researchers have identified collaboration with all stakeholders (e.g., Davis, Darling-Hammond, La Pointe & Meyerson, 2005), setting direction and developing staff (Cowie, Jones, & Harlow, 2011), developing resources to

support and build capacity (Hargreaves & Fink, 2003), and sharing decisions and practices (Lambert, 2003) as the characteristics for sustainable leadership. Thus, according to the findings, it can be expected that school leadership in Eritrea appears sustainable.

The respondents believed that teachers have 'very much' expectation from their school directors for staff management, school development, management of teaching, students' welfare, school environment, legal/ administrative problems, collaboration with parents, tasks dealing with school facilities, collaboration within school, good management of issues, and safeguarding resources. The response rate rose to over 94% with 'very much' or 'quite a lot' expectation. Staff development was among the lowest rated (89.2%) expectation of teachers from their school directors.

Finally, the school directors were asked to give their opinion whether their work as school directors included stress. Approximately 79.4% replied that their work had no stress at all or little stress. Only 5.9% replied that their work as school directors included a lot of stress due to rushing to comply with short deadlines.

Quality and effectiveness of school leadership

Leadership has been described as a process of social influence in which a person can enlist the aid and support of others in the accomplishment of a common task. For example, some understand leaders simply as those people who others follow or who serve as guides or direct others, while others define leadership as organising groups of people to achieve common goals. An educational leader is someone whose actions, both in relation to administrative and educational tasks, are intentionally geared to influence the school's primary processes and, therefore, ultimately students' achievement levels. School leadership is the most important factor for academic achievements (Witziers, Bosker, & Krüger, 2003). Schools that make a difference in students' learning are led by principals who make significant and measurable contributions to the effectiveness of staff and in the learning of pupils in their charge (Hallinger & Heck, 1998).

Regarding quality work, the respondents expressed the following. About one-third (32.9%) of the respondents replied that there was no quality of work in their schools, while another third (34.7%) assured that there was quality work. In general, there was dissatisfaction for the quality of work in the schools.

The respondents were also asked to comment on the assessments and learning outcomes of their schools. Again, about one-third (34.32%) had doubts on the assessment and learning outcomes of their schools, while another third (34.7%) were of the opinion that there were good learning outcomes and good assessments in their schools.

The main problem according to the respondents was the budget. Some (15%) said that there was no budget control, about one-third (32%) reported there was little budget control, while another third (32%) agreed that budget control was quite good in their schools. About one-fifth (21%) were very satisfied with the budget control in their schools.

The respondents were also asked if they received training to improve the quality and effectiveness of school leadership and the quality of education. All respondents regarded trainings beneficial, but their individual comments regarding the training offered to them varied. Most respondents (94%) agreed that training was vital to school directors and teaching staff. Fullan (2001), a strong proponent of this perspective, asserted: 'It has become increasingly clear that leadership at all levels of the system is the key lever for reform, especially leaders who focus on capacity building and develop other leaders who can carry on' (Fullan, 2001, p. 21).

Most of the respondents agreed that training ensures effectiveness in school leadership. As much as 85% also agreed that financial incentives ensure effective school leadership. In addition, the majority were of the opinion that career promotions are a good means of ensuring the effectiveness of school leadership. School directors appear to need recognition of the efforts they have made for their schools. However, the respondents insisted that the creation of conducive teaching and learning environments is the most important means of ensuring effective school leadership. This, they reported, would need an urgent response from the authorities.

The respondents were also asked to present their individual opinions regarding the factors behind the success of their teachers. Almost all respondents (97%) agreed that teaching skills were the most important factor for the success of teachers. Furthermore, most (91%) asserted that to individualise learning was a teacher's most important teaching skill. All respondents agreed that the ability to motivate students to learn was also crucial for a teacher's success. Similarly, all respondents agreed that the involvement of students to make lessons learner-centred was most significant. In practice, all respondents stressed that emphasising the teaching approach (97%) and the collaborative work among colleagues (94%) makes teachers successful and can provide quality learning to the students.

The respondents were also asked about their expectations of their teachers as their directors. Most respondents (82%) answered 'very much' for their teachers' ability and dedication to manage their teaching, while (18%) of the respondents replied 'quite a lot'. Others emphasised student administration tasks, and some also raised the issue of taking care of one's own classroom and equipment. The points that were not given much attention were related to extracurricular activities, taking part in compiling the school timetables and generally good management of issues.

The school directors were also asked about the availability of resources in their schools. These questions investigated funding, support for special education students, ICT and other technical equipment, including access to the internet. The respondents' responses showed dissatisfaction with their schools' resources. When they were asked about the availability of internet access for their students, 97% said there was no internet access at all in their schools. When they were asked about the accessibility of ICT materials (without the internet), half (50%) replied that they had no ICT materials in their schools. In addition, 91% of the respondents were not satisfied with the finance and funding of their schools. Furthermore, 97% expressed their dissatisfaction with the funding for teachers' professional development. Only two respondents were satisfied with the availability of ICT and other technical materials in their schools.

Pedagogical and teacher leadership

Pedagogy is derived from paidagogos (Greek), meaning the teacher of children. The intentional use of the term pedagogy, instead of instruction or teaching, reflects the focus on learning. According to DuFour (2002), educators are redefining the role of principal from an instructional leader to one with a focus on learning. Pedagogical leadership is, therefore, an act that motivates others into a broader way of thinking about the learning-teaching dichotomy.

Taipale (2004, p. 72) defines pedagogical leadership as being 'the superior's ability to guide subordinates toward the common goal, make the specified visions and objectives visible and teach people to understand and interpret, as well as discuss and manage interaction by means of positive interdependence and openness'. Abrevaya and White (2009) view principal leadership as a key mechanism for improving schools.

The second topic of this section, teacher leadership, is often not a formal role, responsibility or set of tasks. It is more a form of agency where teachers are empowered to lead development work that directly affects the high quality of teaching and learning (Harris & Muijs, 2005). Mustonen (2003) suggests that although the ultimate responsibility rests with the leader, the leader promotes his/her own leadership by sharing responsibility and working with teachers. Teachers' co-operation and their increasing ability to exercise decision-making powers related to their own work, in turn, support teachers' professional development.

Drawing on the responses from Zoba Maekel, the sample participants closely related participatory and teacher leadership with each other. This included how often they employed new strategies to numeracy and literacy proposed by subject teachers (58.8%), subject teachers participating in decision-making (55.9%) and department heads playing major roles in deciding on the best methods (61.8%). When asked about reporting to the Ministry

when their school encounters with special literacy and numeracy problems, 41.2% of the school directors said that they employed the practice quite often.

The results regarding the opinions on how best to improve the teaching capacity of staff showed that several school directors invited guest lecturers (55.9%) and employed internal projects (50%) for this purpose. The response rates also indicated that many employed individual courses (44.1%), conferences (67.1%), study visits (67.1%) and reading literature (44.1%) to support their teachers' professional development. Exchanging experiences both within the school (47.1%) and with colleagues from other schools (44.1%) were also quite common practices.

Based on our findings, the school directors established collective reflections amongst the various subjects led by themselves (50%), by the teachers themselves (47.1%), by external actors (35.3%) and with guidance (47.1%). The respondents also believed that teachers tried to develop themselves by inviting guests (64.7%) as well as attending internal projects (50%), individual courses (50%), conferences (58.8%) and study visits (55.9%). In addition, reading literature (61.8%) and exchanging experiences within their school (58.8%) were informed as ways employed by teachers to develop themselves.

The school directors believed that teachers also exchanged experiences with colleagues from other schools (47.1%) and arranged collective reflections amongst the various subjects led by the teachers themselves (44.1%). In addition, teachers quite often appeared to engage themselves in collective reflections amongst the various subjects led by their school directors and obtained guidance (both 50%). Finally, 23.5% of the school directors believed that teachers never engaged in collective reflections amongst the various subjects led by an external actor.

Moreover, the participants were asked five open-ended questions to extract the impact of pedagogical and teacher leadership on classroom instruction. The majority (79.2%) replied that professional support is considered the most important element for the current practices that the school director can support and monitor for effective classroom instruction. In line with this, team spirit (13.7%) and a flexible timetable (7.1%) were mentioned as well. The results reflect the notion by Rayan and Copper (2001, p. 35) that principals visit classrooms and ordinarily hold conferences to provide helpful suggestions. Furthermore, Guthrie and Reed (1991, p. 232) note that the effectiveness of both the school and the school system are dependent on leadership.

The participants were also asked how they assess their role in supporting their planning for classroom instruction. All of them (100%) responded that continuous weekly follow-ups through the pedagogical head were an effective means to enhance teachers' classroom instruction. Moreover, they

were asked what suggestions teachers, students, the school supervisor and parents would have for quality learning. Consistent monitoring (74.5%), quickly correcting mistakes (15.3%) and wise use of school resources (5.2%) were the school directors' responses. The yearning for learning comes, ultimately, from within the individual and within the organisation (Jay, 1992).

Furthermore, the respondents were told that buying reading and numeracy materials (50.8%) and arranging tutorial classes (49.2%) were important elements for the advancement of literacy and numeracy in their schools. Eventually, all respondents (100%) concluded that communicating with all school stakeholders was an effective means of managing change associated with ICT in their schools.

The results appear to follow prerequisites for successful development activities identified by Johnson (2006), comprising safeguarding teachers' broad participation and interaction, continuous training, and good planning and co-ordination of projects. In addition, our results are in alignment with the notion of Bryk, Sebing, Allensworth, Luppescu, and Easton (2010) that principals are willing to use their authority to break down the walls of educator isolation, and create new norms of collaboration and collective responsibility for student learning. Furthermore, our findings correspond to that of Rayan and Copper (2001, p. 35) who said, 'Principals visit classrooms and ordinarily hold conferences to provide helpful suggestions.'

In addition to the above, according to Sebastian and Allenworth, (2012), academic demand and classroom behaviours are better among those teachers who believe they have received high-quality professional development. Thus, it is important that the various ways of professional development training described by the school directors in our survey are of high quality.

Parental involvement from an educational leadership perspective in Eritrea

The provision of quality education and training is the ultimate goal of any educational system. This goal, however, cannot be achieved without the management of parental involvement, which contributes greatly to student success. This is true in that neither the parent nor the school alone can educate the child adequately. This realisation has contributed to parental involvement, although it is not a reality in many educational systems (Schalkwyk, 1987).

Parents play an important role in shaping and building the career of their children due to their immediate influence on their children's behaviour, conduct, character and personality. Parents have the right and responsibility to be included in the education of their children. According to Epstein and Rodroguez-Jansorn (2004) in Ma, Shen, Krenn, Hu and Yuan (2015, p. 20), 'students learn and grow at home, at school, and in their communities,

and they are influenced and assisted by their families, teachers, principals and others in the community.'

As to the benefits related to engaging parents in the formal education of their children, Henderson and Mapp (2002) state that students whose families are engaged are more likely to: (1) earn higher grades and test scores and enrol in higher-level programmes; (2) be promoted, pass their classes and earn credits; (3) attend school regularly; (4) have better social skills, show improved behavior, and adapt well to school; and (5) graduate and go on to post-secondary education. Moreover, Adelman and Taylor (2008), Thurston (2005) and Hoover-Dempsey and Sandler (1997) have indicated that parent involvement has a positive impact on security and school outcomes as well as on lessening chronic absenteeism among students.

Increased parental engagement in schools is cultivated by the principal, whose leadership determines whether or not a school promotes effective parental involvement. As a leader and team builder, the principal guides the school as an institution and plays a pivotal role in creating and maintaining its ethos (UNICEF, 2009). It is impossible for principals to meet all of the instructional needs of a school alone. Therefore, it is imperative that the principal distributes leadership 'across people' (Sherer, 2008). This distribution requires a high level of involvement from staff and parents.

A number of research studies have championed the idea of parental involvement; however, the task of involving parents in the school is not without challenges. Involving parents in schools is the most critical practice in the school culture (Leithwood & Jantzi, 1999). Studies by Park (2008) and Warren, Hong, Rubin and Uy (2009) indicated that the strategy of involving parents was restricted by the parents' socio-economic status.

To have a formal system for parental involvement is crucial and provides the opportunity for parents to share responsibilities and a sense of achievement (Barth, 1990). The Parents-Teachers Association (PTA) is the governance and management mechanism through which this linkage is manifested. In the Eritrean school system, the PTA is organised into a series of standing committees for various activities, such as academic, discipline, finance, technical and maintenance, extracurricular committees, etc. (MOE, 2008).

Therefore, the research was aimed at investigating parental involvement from the educational leadership perspective in Eritrea. It was guided by the following objectives: to establish the rationale for parental involvement; to examine the current status of parental involvement in schools; and to examine the challenges for parental involvement in schools and explore how it can be improved. As mentioned earlier, the participants of the survey were school directors from elementary, junior and secondary schools in Zoba Maekel.

In total, 34 school directors gave their responses on what the rationale was for involving parents in their schools. The results revealed that the majority of the school directors responded 'quite often' and 'very often' that ensuring sustainability (76.5%), identifying and addressing problems (61.7%), developing learning materials (52.9%) and increasing accountability (52.9%) were among the reasons for parental involvement, while developing relevant curriculum (73.5%), maximising limited resources (61.7%) and improving home environment (52.9%) were considered as 'never' and 'sometimes'. However, this exclusion is against the fact that it is impossible for the school and principals to meet all of the instructional needs of a school without the participation of parents (Sherer, 2008).

'How can parents' participation support teachers?' was the next question asked of the participants. Accordingly, more than half (52.9%) replied 'not at all' and 'sometimes' that parents providing accommodation for teachers who work far from school was a form of support. This indicates very low parental participation in easing teachers' living conditions, and this might affect the students' outcome. However, half (50%) replied 'quite a lot' and 'very much' to whether parents participate in supporting teachers' classroom practices. Although it is an average response rate, it agrees with the conclusion that parent involvement has a positive impact on security, school outcomes and in minimising chronic absenteeism among students (Adelman & Taylor, 2008; Hoover-Dempsey & Sandler, 1997; Thurston, 2005).

In responding to the challenges of involving parents, almost all of the participants maintained that resistance among teachers (97.1%), illiterate parents feeling uncomfortable talking to teachers (88.2%), parents' negative school experiences (82.3%), fear of losing economical labour (73.5%), and feelings of parents not having control over the school (58.8%) were considered 'no' or a 'little challenge'. However, this finding stands against findings in previous research in other contexts. For example, Warren, Hong, Rubin and Uy (2009) as well as Leithwood and Jantzi (1999) regard involving parents as the most critical practice for schools.

For the following issues asked of the school directors, they were instructed to give a 'yes' or 'no' answer. All (100%) replied that they discuss parental involvement with their staff. The majority (70.6%) also replied that they set calendars to accommodate major community events, activities and ceremonies. In addition, all (100%) were of the opinion that their staff recognise that parents play a crucial role in their children's education. Furthermore, when they specified the activities of the PTSA in their schools, all (100%) mentioned the activities under the MOE (2008) guidelines, including academic, discipline, financial, technical and maintenance, as well as extracurricular committees.

In responding to the frequency of parents-school conferences per year in their schools, almost all of the participants (91.2%) replied two to four times

while the rest (8.8%) reported a frequency of more than five times a year. This finding shows that the principals play a relatively significant role in involving the parents, and it agrees with the statement by UNICEF (2009) that principals play an important role in increasing parental engagement and promoting effective parental involvement.

Finally, the school directors were asked to give their suggestions on things that need to be done in order to improve the involvement of parents in school affairs. All (100%) suggested that understanding the nature of parents, establishing communication channels, conducting continuous assessments, and having sports and cultural events were among the needs they considered as 'quite' or 'very much' important to improve the involvement of parents.

Eritrean school culture

School culture is an important concept that has received increased attention in recent years due to the realisation that the school environment has a great deal to do with the success of its students and the morale of its staff. The concept of culture in the study of schools is not new, however.

This study focuses on characterising and describing the nature of school culture in Eritrean schools. The 34 school principals completed the questionnaire to identify their individual school cultures according to their own views and attitudes. To study school culture, it was most difficult for the researchers to decide which aspects of the school activities to include or exclude. As the research group for this chapter was working on leadership, it was decided to confine the focus on the leadership culture within the entity of school culture. In addition to the survey of the school directors, the study examined a wide range of literature, refining their analyses to those works that seemed most pertinent to the topic.

The leadership of the principal is a key factor in creating, fostering and sustaining a school culture. It is essential to study the leadership culture of the school and its development as well as the principal's symbolic role in the development process (Alava et al., 2012; Lahtero & Risku, 2012, 2014). The principal's leadership has a significant effect on the culture of the school, through which it indirectly also affects the efficiency and learning results of the school (Harris & Ogbonna, 2000).

Hoy (1990) described the importance of culture as rituals, rites of passage, ceremonies and values in the school. He emphasised school culture as an important vehicle to both resist and to redefine educational innovations. According to Fullan (2001), school culture can be defined as the guiding beliefs and values evident in the way a school operates. School culture can be used to encompass all the attitudes, expected behaviours and values that impact how the school operates. Culture does not remain static but can

change within schools. Principals can shape the culture by being willing to make the necessary changes before asking teachers or staff to undertake any change efforts. Principals must be willing to change their own thinking and practices before they can lead others in implementing the dynamic challenges of school reform, and it is then that the school culture can be inculcated in a positive way. There is substantial evidence in the literature to suggest that a school principal must be the first to understand the school's culture before implementing any change (Leithwood et al., 2004).

Bearing the above literature in mind with regard to school culture in the Eritrean context, we asked the school directors how much effort they put into the establishment of their school culture. Most of the respondents (62%) replied that they 'very often' made intensive efforts to establish school culture, while 12.4% responded 'quite often'. Thus, a majority of the school directors committed great attention and awareness in promoting school culture.

Based on the responses, 34% of the school directors were involved in whole staff meetings, 28% in management meetings, 29.9% in departmental meetings and 23.7% in parental meetings. Looking at parental involvement from the angle of leadership culture, we asked the school directors whether their school building was open for parents and communities. Half of the school directors (53%) replied that their schools were always open for parents and communities as needed. However, 47% of the school directors said that they did not open the door for parents after school hours.

We can infer that there are school directors who are weak in their relationships with parents, and they should strengthen their accessibility and their relationships with parents and the rest of community to open the lines of communication and promote a positive school culture. In addition to this, they should involve parents in the different activities of the school.

According to Leithwood and Jantzi (1999), the most critical practice in the culture of school leadership involves promoting parental and community involvement in the school. Leadership is no longer considered the stake of only the school directors; participation in decision-making should begin with all members of the school community. The ideal of strategic leadership cannot be attributed to only one person; it calls for the cooperation of key persons in the organisation (Cunningham, 1994). The leadership team members participating in decision-making enhance the understanding and commitment to the implementation stage of the chosen strategies (Yukl, 2006).

In interpreting the above findings, one must be aware of the fact that the school directors have taken an active part in meetings with the teachers, parents and the management team to make intensively effective changes in their schools. However, the school directors' awareness of the realisation

of meetings in the student context with school principals seemed weaker. Slightly less than half of the school directors (44%) replied that they engaged themselves in arranged student meetings and more than half (56%) never appeared to have meetings with students. School directors' direct communication with students in Eritrean schools is thus not satisfactory. School directors witnessed that they rarely participated with the students in the management activities of their schools.

The analysis indicated that sharing experiences and ideas among schools and between schools was not yet the habit of school directors. However, the findings regarding the culture of collaboration, collegiality, and sharing responsibility among teachers within the school indicated a high level of school directors' involvement. This is greatly significant, because sharing leadership may have its greatest impact by reducing teacher isolation and increasing commitment to the common good (Pounder, 1999).

Regarding teachers' decision-making, 62% of the respondents argued that teachers participated in decision-making and shared responsibilities in schools. However, the participation of teachers in school development planning is not strong enough (59%). This result clearly indicates that teachers' participatory capacity in planning activities is very low.

Most school directors (88%) reported that collaborative activities are very common in their schools, and almost all of them (91%) pointed out that harmony and respect of colleagues were positive in their schools. The finding indicates that school directors were aware of the collegiality, collaboration, harmony and distribution of responsibility among their staff members. Supportive interactions among teachers in school are essential so that professional communities can enable them to assume various roles. These include sharing values, a common focus on student learning, collaboration in the development of curriculum and instruction, sharing practices, and reflective dialogue (Kruse, Louis, & Bryk, 1995). Although many factors affect whether a professional community will exist in a school, one of the most significant factors is strong principal leadership (Bryk, Camburn, & Louis, 1999). It is essential to understand that different teacher cultures affect single teachers and their actions and that, in the end, the core task of the school is the education of the pupils (Luukkainen, 2005).

The concept of school culture relates to all school activities and practices conducted in schools. School culture is a product of the meaning and interpretation processes, which constitute themselves through the symbols of the principal's functional, verbal and material leadership. According to one open-ended question, 62% of the schools in our sample can be identified and characterised by a well-disciplined environment where teaching and learning can be conducted smoothly. Next to the above analysis, 17.5% of the school directors also argued that they took into consideration school sanitation and cleanliness when it supports teaching and learning. Based

on our findings, it can be noted that the school directors showed very little consideration for the performance of their school and for the positive results of their students.

To summarise our survey, we can conclude the following. The school directors understood their roles as working for learning outcomes, managing staff and pedagogical leadership. They felt autonomous but also expressed that their teachers had demanding expectations of them. The directors appreciated parents' involvement; nevertheless, they admitted that there were some challenges. According to our study, the school directors also argued that little attention had been given to their own capacity building. Regarding the school budget and management, the directors highlighted that they needed more attention. The directors were aware that opinions were not shared much among schools, such as through cooperation with colleagues. School timetables were not always suitable for the teachers' needs to enable this and the timetables lacked flexibility. Teachers complained that the timetables were not meeting their needs. In addition, there was little communication between school directors and students.

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Appendix: School Director Survey

School Director Survey for the ELFA Project

ኣብ ነኪይዶ ዘለና መጽናዕቲ **ሓላፊ ቤት ትምህርቲ** ተባሂሉ ተጠቒሱ ዘሎ፣ ንኹላቶም ኣብ ደረጃ ቤት ትምህርቲ ከም ኣገዳዲ ናይ ምምራሕ ሓላፍነት ንዘለዎ ዝምልከት እዩ። ንቁሪቡ ዘሎ ሕቶታት፣ ኣብ ናይ ምምራሕ ዕማማት ዘለካ ሓላፍነት ተሞርኩስክ ኪትምልሰሉ ምስ ልዕል ኣኽብሮት ንሓትት።

In this survey we are using the title school director to refer to all school leaders responsible for a school unit. When answering to the questions concerning the school director, please, answer based on your leadership task.

መሕትት ንሓለፍቲ ኣብያተ ትምህርቲ

Questionnaire for School Directors

A. ሓፈሻዊ ሓበሬታ **General Information**

1. ዞባ ፡- **Region**

2. ንኡስ ዞባ ***Sub Region*** 2,1 ቦረኽ Berik
2,2 ደ/ ምብራቕ s/East
2,3 ደ/ ምዕራብ s/west
2,4 ጋላነፋ, Galanefhi
2,5 ሰ/ ምብራቕ n/east
2,6 ሰ/ ምዕራብ s/west
2,7 ሰረጀቓ Serejeka

3. ስም ቤ/ትምርኺ **School Name**

4. ደረጃ ትሰርሓሉ ቤ/ትምህርኺ **School Level**
4,1 መዋእለ ህጻናት ***Kindergarten***
4,2 መባእታ ደረጃ ***Elementary***
4,3 ማእከላይ ደረጃ ***Middle***
4,4 ካልኣይ ደረጃ ***Secondary***
4,5 መባእታን ማእከላይ ደረጃ ***Elementary and Middle***
4,6 ማእከላይን ካልኣይን ደረጃ ***Middle and Secondary***
4,7 መባእታን ማእከላይን ካልኣይን ደረጃ ***Elem, Jun and Secondary***

5. ዋንነት ቤ/ትምህርቲ **School Ownership**
5,1 መንግስታዊ ***Government***
5,2 ብሕቲ ***Private***
5,3 ሚስዮን ***Mission***
5,4 ከሚኒቲ ***Community***

6. ብዝሒ ህሉዋት ተማሃሮ ኣብ 2016/17 **Number of Students**
6.1 ተባ ***Male*** _____ 6.2 ኣን ***Female*** _____ 6.3 ድምር ***Total*** _____

7. ዝተዋህቦ ህጡጥ ተ/ መማህራን ኣብ 2016/17 **Number of Teachers**
6.1 ተባ ***Male*** _____ 6.2 ኣን ***Female*** _____ 6.3 ድምር ***Total*** _____

8. ጾታ **Gender**
8.1 ተባ ***Male*** ☐ 8.2 ኣን ***Female*** ☐

9. ዕድመ Age _____

10. **ዝለዓለ ኣካዳምያዊ ደረጃ ትምህርቲ** ዝበጽሕኦ/ኦ/ኦ ***highest academic qualification***
10,1 ትሕቲ ካልኣይ ደረጃ ***Not completed Secondary level***
10,2 ካልኣይ ደረጃ ወዲእ ***Competed secondary level***
10,3 12+1
10,4 12+2
10,5 12+3
10,6 12+4
10,7 12+5
10,8 12+6
10,9 12+6 ን ልዕሉን ***above 12+6***

11.ዓመተ ምህረት ዝለዓለ	አካዳምያዊ ትምህርቲ ዝወሰደኮቦ/ኮቦ	Year of Completion Academic highest level
11,1 ቅድሚ 1975	Before 1975	
11,2 1975-1990		
11,3 1991-2000		
11,4 2001 - 2006		
11,5 2007 - 2010		
11,6 2011- 2016		

12. ዝለዓለ ዝወሰደኮቦ/ኮቦ ሞያዊ ትምህርቲ highest professional training attended

11.1 ሞያዊ ትምህርቲ ኣይወሰደንኩን No professional Training attended

11.2 ሰርትፊከይ ምስልጣን መማህሪ Certificate from Teacher Training

11.3 ዲፕሎም ኣብ ኮለጅ ትምህርቲ Diploma from College of Education

11.4 ዲፕሎማ ብምፈልጣኒ ትምህርቲ Diploma by Distance learning on Education

11.5 ዲግሪ ኣብ ኮለጅ ትምህርቲ Digree from College of Education

11.6 ዲግሪ ብምፈልጣኒ ትምህርቲ Digree by Distance learning on Education

11.7 ማስተርን ኣብ ኮለጅ ትምህርቲ Masters from College of Education

11.8 ማስተርን ብምፈልጣኒ ትምህር Masters by Distance learning on Education

13.ዓመተ ምህረት ዝለዓለ	ሞያዊ ትምህርቲ ዝወሰደኮቦ/ዪ	Year of highest professional training attended
13,1 ቅድሚ 1975	Before 1975	
13,2 1975-1990		
13,3 1991-2000		
13,4 2001-2006		
13,5 2007-2010		
13,6 2011-2016		

14. ተመክሮ ስራሕ ከም መምህር ብዓመታት	Work Experience in Years as a subject teacher
14,1 ትሕቲ 5 ዓመት	less than 5 years
14,2 5- 10 ዓመት	5-10 years
14,3 11-15 ዓመት	11-15 years
14,4 16-20 ዓመት	16-20 years
14,5 21-30 ዓመት	21-30 years
14,6 31-40 ዓመት	31-40 years
14,7 ልዕሊ 40 ዓመት	above 40 years

15	ብኽመይ ጻይረክተር ቤት ትምህርቲ ኪትክውን በቒዕካ ። ኩሉ ቅኑዕ እዩ ትብሉ ኪትመርጹ ትኽእሉ።	How do you happen to become a school director? Please, Choose all that apply.
15,1	ኣብቲ ሞያ ተገዳስነት ስለዝህበረኒ	I was intersted in the profession
15,2	ኣብነታዊ መምህር ስለዝነበርኩ	I was an exemplary teacher
15,3	ናይ ጻይረክተርነት ስልጠና ስለዝወሰድኩ	I was trained for it
15,4	ብዝለኒ ናይ ስራሕ ተሞክሮ	Because of my experience
15,5	ጻይረክተር ቤት ትምህርቲ ኪኸውን ስለዝተመደብኩ	They just appointed me
15,6	ካልእ_____	Any other specify

16. ተመክሮ ስራሕ ከም ጻይረክተር ብዓመታ	Work Experience in Years as a School Director
16,1 ትሕቲ 5 ዓመት	less than 5 years
16,2 5- 10 ዓመት	5-10 years
16,3 11-15 ዓመት	11-15 years
16,4 16-20 ዓመት	16-20 years
16,5 21-30 ዓመት	21-30 years
16,6 31-40 ዓመት	31-40 years
16,7 ልዕሊ 40 ዓመት	above 40 years

B. ተራ ሓላፊ ቤት ትምህርቲ ንቀጻልነት መረሕነት

School Director's Roles and Sustainable Leadership

17. ከም ሓላፊ ቤት ትምህርቲ እዞም ዝስዕቡ ነጥብታት ኣገዳስነቶም ብኽመይ ትረኣዮም። How important are the following roles to you in your work as as a school director.

	ኣገዳስነት Role				
	ዮብሉን not at all	ውሑድ a little	ብቅሕ Quite	ኣዝዩ	Very
17,1 ምምራሕ ስነ ምምህርና Pedagogical Leadership					
17,2 ምሕደራዊ ስርሓት Administrative management					

17,3 ምምሕዳር ሰራሕተኛታትን መማህራንን *Staff manage*				
17,4 ጽቡች ትምህርታዊ ውጽኢት *Good learning outcomes*				
17,5 ጽቡች ማሕበራዊ ውጽኢት *Good societal outcomes*				
17,6 ፍሉይ ሓገዝ ንዝደልዩ ተማህሮ ኣብ ግምት ምእታው *Taking into accounting students' special needs*				
17,7 ምስ ወለዲ ምስራሕ *Working with parents*				
17,8 ካልእ እንተሉ *Other, what* _____				

18 . ከም ሓላፊ ቤት ትምህርቲ ኣብ ስራሕካ ዘለካ ነጻነት ከመይ ትገልጾ ?
How would you describe your autonomy as a school director

	ነጻነት የብለይን no autonomy	ቁሩብ ነጻነት ኣሎኒ a little	ደሓን ዝኾነ ነጻነት ኣሎኒ Quate a lot	እኹል ነጻነት ኣሎኒ very much

19. ከም ሓላፊ ቤት ትምህርቲ ዕማማት ማዕረ ክንደይ ተተግብሮም ? ***How often do you carry out the following tasks as a school director.***

	ብፍጹም never	ሳሕቲ sometimes	ብዙሕ ግዜ Quite often	ኣዝዩ ብዙሕ ግዜ Very often
19.1 ስነ ምምህርናዊ ዕማማት *Pedagogical tasks*				
19.2 ምምሕዳራዊ ዕማማት *Administrative tasks*				
19.3 ምምሕዳር ሰራሕተኛታት *Staff management tasks*				
19.4 ምርግጋጽ ጽቡች ትምህርታዊ ውጽኢት *Ensuring good learning outcomes*				
19.5 ምርግጋጽ ጽቡች ማሕበረ ሰብኣዊ ውጽኢት *Ensuring good societal outcomes*				
19.6 ምርግጋጽ ዲሲፕሊን ተማህሮ *Ensuring student discipline*				
19.7 ምስ ወለዲ ምስራሕ *Working with parents*				
19.8 ካልእ እንተሉ *Other , what* _____				

20. ኣብ ቤት ትምህርትካ/ኺ ዝተም ዝስዕቡ ንጥፈታት ክተተግብር ክንደይናይ ጻዕሪ ተካይድ=
How much effort do you put to establish the following activities in your school?

	ፈጺሙ not at all	ትሑት a little	እኹል Quite a lot	ኣዝዩ ብዙሕ Very much
20.1 ሓባራዊ ራኢይ ክብርታትን ኣብ ምስራጽ *Having a shared vision and value*				
20.2 ባህሊ ትምህርቲ ኣብ ምኹስኳስ *Creating school culture*				
20.3 ምቕላ ሃዋህው ኣብ ምፍጣር *Creating an enabling environment*				
20.4 ኣሳታፈ ውሳኔ ኣብ *Participative decision making*				
20.5 ዓቅሚ መማህራን ኣብ ምህናጽ *Building staff capacity*				

21. ብርእይቶኻ፡ ከም ሓላፊ ቤት ትምህርቶም መማህራን ክገሽ እንታይ ይጽበዩ?
In your opinion, what do teachers expect from you as their school director?

	ፈጺሙ not at all	ትሑት a little	እኹል Quite a lot	ኣዝዩ ብዙሕ Very much
21.1 ምስ ወለዲ ብሓባር ምስራሕ *Collaboration with parents*				
21.2 ምምዕባል መሳለጥያ ትምህርቲ *Tasks dealing withschool facilities*				
21.3 ኣብ ምሕደራ መማህራን ሰራሕተኛታትን *Staff management*				
21.4 ምምዕባል ቤት ትምህርቲ *School development*				
21.5 ፈናንሳዊ ምሕደራ *Financial management*				

21.6 ምሕደራ ምምህርን ምስትምህርን *Management of Teaching*				
21.7 ሞያዊ ዕበት መማህራን *Staff professional development*				
21.8 ስትራተጂካዊ ምዕባለ *Strategic development*				
21.9 ምሕደራ መተኪኢታ ንዝሰርሑ መማህራን *Management of substitute teachers*				
21.10 ድሕንትን ውሕስንትን ተማህሮ *Students welfare*				
21.11 ንምጋም ቤት ትምህርቲ ምኽያድ *School environment*				
21.12 ሕጋውን ምሕደራውን ጸገማት ምፍታሕ *Legal/administrative problems*				
21.13 ምትሕግጋዝ ኣብ ውሽጢ ቤት ትምህርቲ *Collaboration within school*				
21.14 ጽቡቕ ምሕደር ጉዳያት *General good managemnet of issues*				
21.15 ምዕቃብ ጸጋታት *Safeguarding resources*				

22. ከም ሓላፊ ቤት ትምህርቲ ስራሕ ጸቅጢ ይፈጥረልኩ?= *Does your work as a school director include stress*

	ፍጹም not at all	ውሑድ a little	ብዙሕ Quite a lot	ኣዝዩ ብዙሕ much Very

23.ናይ ስራሕ ጸቅጢ እንተለካ ብኽመይ ይብከስ = *If you have stress what causes it to you?*

	ፍጹም not at all	ውሑድ a little	ብዙሕ Quite a lot	ኣዝዩ ብዙሕ much Very
23.1 ዘይ ምጥርናፍ ስራሕ *Disjointedness of work*				
23.2 ጸገም ዘለዎ ስርሓት *Problematic duties*				
23.3 ሀጹጽ ስራሕ *Rush*				
23.4 ተስፋ ምቑራጽን *Frustration*				
23.5 ምስ መማህራን ዘይምስናይ *Problems with staff*				

C. ብሉጽን ኣድማዕን ምሕደራ ቤት ትምህርቲ
Quality and Effectiveness Of School Leadership

24 .ካብዞም ዝስዕቡ ዓወት ናይ ቤት ትምህርቲ ንምርግጋጽ ዝያዳ ዘገድስ ኣሎኻ እዮም።ከኸም ኣገዳስነቶም ካብ 1 ሲታብ 9 ዘርዝሮም (1 ኣዝዩ ኣገዳሲ 9 ትሑት ኣገዳሊ)።ኣደ ቁጽሪ ሓንሳብ ጥራይ ጸሓፍ። *In your opinion, which of the following are the most important for successful school directorship? Rank according to the relative importance so that 1 is the most important and 9 the least important. Use one rank only once.*

24,1 ምኽእ ናይ ምምህር ኩነታት ዝፈጥር ውሳኔ *Deciding who creats the learning environment*	
24,2 ሓባራዊ ስራሕ ምዝውታር *Practicing collaborative work*	
24,3 ሓባራዊ ራእይ ምፍጣር *Creating a shared vision*	
24,4 ጻሊፕለን ተማህሮ ምቁጽጻር *Controlling students discipling*	
24,5 ጻሊፕለን መማህራን ምቁጽጻር *Controlling teachers discipling*	
24,6 ምኽራብ ናውቲ ትምህርቲ ንመማህራን *Providing materials to teachers*	
24,7 ፊናንሳዊ ምትብባዕ ንመማህራን *Providing financial reward to teachers*	
24,8 ነጻ ርእሰ ምሕደራ ምህዉታር *Having autonomy*	
24,9 ውክልና ስራሕ ንመማህራን *Delegating tasks to teachers*	

25. እሞም ዝስዕቡ ንጥፈታት ከም ሓላፊ ቤት ትምህርቲ ኣብ ስራሕኽ ከመይ ይጸልዉኻ ? *How Do the following activities affect your work as a school director?*

	ፍጹም not at all	ውሑድ a little	ብዙሕ Quite a lot	ኣዝዩ ብዙሕ much Very
25.1 ዓይነት ስራሕ ኣብ ቤት ትምህርት *Quality work in your school*				
25.2 ምኽራብ ዓይነት ጽብጻብ ስራሕ ቤት ትምህርቲ *Quality report by the school*				
25.3 ውጺኢት ተማህሮ ኣብ ናይ ቤት ትምህርቲ መርመራ *Tests/student learning outcome measurements*				
25.4 ውጺኢት ተማህሮ ኣብ ሃገራዊ መርመራ *National tests/student learning outcome measurements*				
25.5ምክትታልን ምቁጽጻርን ባጀት ቤት ትምህርቲ *Budget monitoring of your school*				

25.6 ትጽቢት ኣብ ብቕዓት ቤት ትምህርቲ
Effectiveness demands on your school

26. ካብዘም ዝስዕቡ ንጥረታት ኣድማዒ ምሕደራ ቤት ትምህርቲ የረጋግጽ ኢዩ ኢልካ ትሓስብ።
How do you think the following activities ensure effective school leadership in your school?

	ፍጹም not at all	ውሑድ a little	ብዝሓ Quite a lot	ኣዝዩ ብዝሓ Very much
26,1 ስልጠና ***Training***				
26,2 ፈናንሳዊ መተባብዒ ***Financial incentives***				
26,3 ሞያዊ ዕቤት ***Career promotions***				
26,4 ኣፍልጦ ምህባ ***Recognition***				
26,5 ምቹእ ናይ ምምህር ምስትምህር ነዋህዩ ምፍጣር ***Conducive teaching environment***				
26,6 ካልእ እንተሉ ***Other, what*** _____				

27. ካብዘም ዝስዕቡ ኣብ ቤት ትምህርትኻ ንብሉጽ መምህርትኽ ኣዘዩ ኣገዳሲ ኣሎናይ ትብል?
In your opinion, which of the following are the most important for successful teachers in your school?

	ፍጹም not at all	ውሑድ a little	ብዝሓ Quite a lot	ኣዝዩ ብዝሓ Very much
27,1 ናይ ምምህር ክእለት ***Teaching skills***				
27,2 ናይ ውልቀ ተማህሮ ዓቕሚ ኣለኺ ናይ ምምህር ዓቕሚ ***Skills to individualise learning***				
27,3 ተማህሮ ናይ ምትብባዕ ክእለት ***Ability to motivate students***				
27,4 ተማህሮና ናይ ምስታፍ ክእለት ***Ability to involve students***				
27,5 ኣብ ዘተ ዝኣምን ***Ability for value discussions***				
27,6 ክእለት መረሕነትን ምሕደራን ***Leadership and management skills***				
27,7 ክእለት መሳርሕትኻ ተሓባቢርካ ምስራሕ ***Ability to collaborate among colleagues***				
27,8 ፍልጠቱን ክእለቱን ዘማዕብል ***Ability to develop one's knowledge and skills***				
27,9 ጽቡቕ ናይ ምውሃድ ክእለት ምስ ኣለይቲ ተማህሮን ካልኦት ኣወሃህድቲ ደገፍን ***Good collaboration skills with student care and other support staff***				
27.10 ካልእ እንተሉ ***Other, what*** _____				

28. ደረጃ ብቕዓት ተማህሮ ኣብ መሰረታዊ ምንባብን ምጽሓፍን ከምኡውን ምቕማር ቁጽሪ ንምምላኽ እንታይ መምዘኒ ትጥቀም
What measures/indicators do you have to ensure the quality of literacy and numeracy education?

29. ደረጃ ብቕዓት ተማህሮ ኣብ መሰረታዊ ምንባብን ምጽሓፍን ከምኡውን ምቕማር ቁጽሪ ንንምሕያሽ እንታይ ሜላ ትጥቀም?
What strategies/methods have you used in your school to improve the effectiveness of literacy and numeracy education?

30. ብርኢይቶኻ ብቑዕ ሓላፊ ቤት ትምህርቲ ካብ ምኼን ዝዕንቅፈካ እንታይ እዩ።
In your opinion, what hinders you most from becoming an effective school director?

31 ከም ሓላፊ ቤት ትምህርቲ ካብ መምህራትካ/ኪ እንታይ ትጽበሉ/ይ
What do you expect from your teachers as their school director?

		ቕሊ ኣንቲ ኣይተገነን	ውሑድ a little	ብዙሕ Quite a lot	ኣዝዩ ብዙሕ Very much
	ዝምድና ወላዲን ቤት ትምህርትን				
31,1	***Home school collaboration***				
	ምክንኻን መምህራ ክፍልን ናውትን				
31,2	***Taking care of their own classrooms and equipment***				
	ምሕደራ ተማህሮ ምክትታል				
31,3	***Student administration tasks***				
	ተሳትፎ ኣብ ምዕባለ ቤት ትምህርቲ				
31,4	***School development***				
31,5	ተሳትፎ ኣብ ቁጠባ ምሕደራ ቤት ትምህርቲ ***Taking part in managing school economy***				
	ኣተኽሮ ኣብ ምምህሃር ምስትምሃር				
31,6	***Managing their teaching***				
	ተሳትፎ ኣብ ሞያዊ ምዕባለ				
31,7	***Taking part in professional development***				
	ተሳትፎ ኣብ ምድላው ሰሌዳ ግዜ				
31,8	***Taking part in compiling the school timetables***				
31,9	መማህራን ኣብ ዝቦኽሮሉ መተካእታ ምቕራብ ***Getting their own substitute teachers***				
	ኣብ ድሕነት ውሕስነት ተማህሮ ምውሳእ				
31.10	***Student care***				
31.11	ኣብ ንምጋም ስራሕ ቤት ትምህርቲ ምስታፍ ***Taking part in school evaluation***				
31.12	ኣብ ናይ መማህራን ምህደራውን ሕጋውን ጸገማት ምፍታሕ ምውሳእ ***Dealing with their own legal/administrative problems***				
	ኣብ ተውሳኺ ካረክለማዊ ንጥፈታት ምስታፍ				
31.13	***Extra-curricular activities***				
31.14	ኣብ ውሽጢ ቤት ትምህርቲ ዝወሃብ ስርሓት ብሓላፍነት ምስታፍ ***Taking part in distributed leadership within the school***				
	ኣብ ጥዑይ ምሕደራ ጉዳይ ምስታፍ				
31.15	***General good management of issues***				

32. ኣብ ቤት ትምህርትኻ ዘሎ ጸጋታት እንታይ ከም ዝመስል ንምጋም ሃብ ። ምስዚ ዝስዕብ በዚ ዝስዕብ ።
What do you think about the resources of your school? ***I agree with the following***

		ፈጺሙ ኣይሰማማዕን not at all	ትሕቲ ዝበለ እየ a little	ብዙሕ እየ Quite a lot	ኣዝዩ እየ Very much
32,1	ቤት ትምህርተይ ንዝተፈላለየ ንጥፈታት መካየ እኹል ገንዘብ ኣለዎ ***My school has enough funding for good activity***				
32,2	ብሓባት ፍሉይ ትምህርቲ ንዝደልዩ ተማህሮ እኹል ጸጋታት የፍስስ። ***I have quite often spent resources to meet the needs of special education students***				
32,3	ቤት ትምህርተይ ዝተፈላለየ ንጥፈታት ዘድሊ መካየድ እኹል ገንዘብ ኣለዎ። ***My school has enough resources to teach the students***				

32,4	ሞያዊ ዕቢት መማህራን ንምርግጋጽ ብዘሎኒ ጸጋታት ቤት ትምህርቲ ዕጉብ እዩ። **I am happy with the resources for teachers' professional development**				
32,5	ሞያዊ ዕቢተይ ንምርግጋጽ ብዘሎ ጸጋታት ቤት ትምህርቲ ዕጉብ እዩ። ***I am satisfied with the resources for my own professional development***				
32,6	ቴክኖሎጂ ንዋየን ኪጥቀሙ ጽቡች ዕድልን ባይታን ኣለዎም ***The staff has good opportunities to get ICT and other technical equipment***				
32,7	ኩላቶም ተማህሮ ናይ ኮምፒዩተር ኣገልግሎትን ቤት ትምህርቲ ይረኽቡ። ***All students have access to computers at school***				
33,8	ኩላቶም ተማህሮ ናይ ኢንተርነትን ኣገልግሎት ኣብ ቤት ትምህርቲ ይረኽቡ። ***All students have access to the internet at school***				
32,9	ቤት ትምህርቲና ንመማህራንን ናይ ምምሕዳር ሰራሕተኛታትን ዘድልዮም እኹል ጸጋታት ኣለዎ ***Our school has enough resources for the staff who need them***				

D. ስነ ምምህርናዊ ምሕደራን መራሕነት መምህረን

Pedagogical and Teacher Leadership

33 ከም ሓላፊ ቤት ትምህርቲ ኣድማዕን ውጺኣውን ምምሃር ምስትምሃር ንኪህሉ እንታይ ናይ ደገፍ መቆጻጸሪን ኣገባብ ትጥቀም
What are the current practices you have as a school director to support and monitor effective classroom instruction?

34. መማህራን ኣብ ዘጻፅውዎ ውጥን ምህሮ፡ ተራኽን ኣብ ትህበ ሞያዊ ደገፍ ከም ሓላፊ ቤት ትምህርቲ ከመይ ይግምግምዎ።
How do teachers assess your role as a school director in supporting their planning of classroom instruction?

35 ንምምሕያሽ ዓይነት ምህሮ ኣብ ትንብሮ ጻዕሪ ፡ መማህራን ፡ሱፐርቫይዘራትን ተማህሮን ዉሊድን እንታይ ርኢይቶ የቕርቦልካ።
What suggestions do teachers, school supervisors, students and parents have to improve your support for quality learning?

36. መባእታ ንብብን ምጽሓፍን ከምኡውን ምችማር ቁጽርን ንምድንፋዕ እንታይ ስነ ምምህርናዊ ውጥን ኣለካ
What pedegogical plans do you have for the advancement of literacy and numeracy education in your school?

37. ኣብ ቤት ትምህርትኻ ዝሓሸ ኣገባብ ምሕደራ ሓበሬታ ኮሙኒኬሽን ቀስዮሎጂን (ICT) ንምእትታው እንታይ ዓይነት ደገፍ ተብርክት።
How do you support in choosing appropriate methods of managing change associated with ICT use in your school?

38. ዝዞም ዝስዕቡ ንጥፈታት አብ ቤት ትምህርትኻ ማዕረ ክንደይ ተተግብሮም ።
How often do you employ the following activities in your school?

		ፈጺሙ ኣይተግበሮን never	ሳሕቲ sometimes	ብዙሕ ግዜ Quite often	ኣዝዩ ብዙሕ ግዜ often	Very
38,1	ናይ መባእታዊ ንባብን ምጽሓፍን ከምኡውን ምቕማር ቁጽሮን ***New strategies of literacy and numeracy proposed by subject teachers***					
38,2	ተሳታፍነት መማህራን ኣብ ውሳኔ ጉዳያት ቤት ትምህርቲ ***Subject teachers participating in decision making***					
38,3	ተራ ሓለፍቲ ደፓርትመንት ኣብ ምምራጽ ዝበለጸ ኣገባብ ኣመሃህራ ***Department heads playing a role in deciding which method is the best***					
38,4	መባእታ ንባብን ምጽሓፍን ከምኡውን ምቕማር ቁጽሮን ፍሉይ ጸገም ኣብ ዝጋጥመሉ እዋን ንሓለፍት ትምህርቲ ምሕባር ***Reporting to the Ministry when your school encounters a special literacy or numeracy problem***					

39.ዓቕሚ መማህራንካ ኣብ ምምህር ምስትምህር ንምዕባይ ተራ ናይዞም ስዒቦም ዘለዉ ክመይ ትግምግሞም።
In your opinion, how can you best improve the capacity of your staff in relation to the teaching provided by your school?

		ጽልዋ Effect			
		ፈጺሙ ዮብሉን No	ትሑት a little	ብዙሕ quite a lot	ኣዝዩ ብዙሕ very much
39,1	ኣስተምህሮ ብዕዱማት ኪኢላታት ***Guest lecturilers***				
39,2	ውሽጣዊ ፕሮጀክት ቤት ትምህርቲ ***Internal projects***				
39,3	ብውልቂ ስለጠና ብምውሳድ ***Individual courses***				
39,4	ዓውደ ጽተ ምስታፍ ***Conferences***				
39,5	ብትምህርታዊ ዕደት ***Study visits***				
39,6	ጽሑፋት ብምንባብ ***Reading literature***				
39,7	ኣብ ውሽጢ ቤት ትምህርቲ ተመኩሮ ብምልዉዋጥ ***Exchange of experiences within your school***				
39,8	ምስ ናይ ካልኦት ኣብያተ ትምህርቲ መማህራን ተሞክሮ ምልዉዋጥ ***Exchange of experiences with colleagues from other schools***				
39,9	ብሓላፊ ቤት ትምህርቲ ዝምራሕ ንዝተፈላለዩ መማህራን ዝጥርንፍ ሓቢራዊ ዘተ ምግባር ***Collective reflections amongst the various subjects led by myself***				
39.10	ብመማህራን ዝምራሕ ሓቢራዊ ዘተ ምግባር ***Collective reflections amongst the various subjects led by teachers themselves***				
39.11	ምዕዳን መምርሒ ብምህባብ ***Guidance***				
39.12	ብኣባላት ቤት ትምህርቲ ዘይኮኑ ዝከየድ ሓቢራዊ ዘተ ***Collective reflections amongst the various subjects led by an external actor***				
39.13	ካልእ እንተሎ ***Other, what*** _____				

40 ***How often do the teachers in your school try develop themselves by using the following?***
ኣብ ቤት ትምህርቲ ዘለዉ መማህራን በዚኦም ዝስዕቡ መንገድታት ክእለቶም ንምዕባይ ማዕረ ክንደይ ይጽዕሩ።

	ፈጺሞ አይጥቀሙኘ never	ኣሕቲ sometimes	ብዙሕ ግዜ Quite often	ኣዝዩ ብዙሕ ግዜ Very often
40.1 ኣስተምህሮ ብዕዳጣት ኪኣላታት ***Guest lecturilers***				
40.2 ውሽጣዊ ፕሮጀክት ቤት ትምህርቲ ***Internal projects***				
40.3 ብውልቂ ስልጠና ብምውሳድ ***Individual courses***				
40.4 ዓውደ ዙተ ምስታፍ ***Conferences***				
40.5 ብትምህርታዊ ዑደት ***Study visits***				
40.6 ጽሑፋት ብምንባብ ***Reading literature***				
ኣብ ውሽጢ ቤት ትምህርቲ ተመኩሮ ብምልዋዉጥ 40.7 ***Exchange of experiences within your school***				
ምስ ናይ ካልኦት ኣብያተ ትምህርቲ መማህራን ተሞክሮ ምልውዋጥ ***Exchange of experiences with colleagues from other schools*** 40.8				
ብሓላፊ ቤት ትምህርቲ ዝምራሕ ንዝተፈላለዩ መማህራን ዝጥርንፍ ኣቢራዊ ዙተ ምግባር ***Collective reflections amongst the various subjects led by myself*** 40.9				
ብመማህራን ዝምራሕ ኣቢራዊ ዙተ ምግባር ***Collective reflections amongst the various subjects led by teachers themselves*** 40.10				
40.11 ምዕዳን መምርሒ ብምህባብ ***Guidance***				
ብኣባላት ቤት ትምህርቲ ዘይኮኑ ዝከየድ ኣቢራዊ ዙተ ***Collective reflections amongst the various subjects led by an external actor*** 40.12				
40.13 ካልኦት እንተሉ ***Other, what*** _____				

E. ተሳታፍነት ወለዲ *Parental involvement*

41 ወለዲ ኣብ ጉዳያት ቤት ትምህርቲ ዝሳተፉሉ ቀንዲ ምኽንያት እንታይ እዩ ? ***What are the rationale for involving parents in your school?***

	ፈጺሙ ምኽኒያት ኣይህሉን not at all	ቅሩብ a little	ብዙሕ Quite a lot	ኣዝዩ ብዙሕ Very much
41,1 ምምቕራሕ ድሩት ጸጋታት ***Maximizing limited resources***				
41,2 ካርኩለም ኣብ ምምዕባል ***Developing relevant curriculum***				
ናይ ትምህርቲ መሳርሒታት ምምዕባል 41,3 ***Developing learning materials***				
ጸገማት ምልላይን ንምፍታሕን 41,4 ***Identifying and addressing problems***				
41,5 ተሓታትነት ምዕባይ ***Increasing accountability***				
ቀጻልነት ዕቤት ቤት ትምህርቲ ንምርግጋጽ 41,6 ***Ensuring sustainability***				
ምምሕያሽ ስድራቤታዊ ኩነታት 41,7 ***Improving home environment***				

42. ናይ ወለዲ ተሳታፍነት ንመማህራን ከመይ ይሕግዝ ኢልካ/ኪ ትግምት/ቲ ***In your opinion, how can parents' participation support teachers?***

	ፈጺሙ ኣይሕግዝን not at all	ቅሩብ a little	ብዙሕ Quite a lot	ኣዝዩ ብዙሕ Very much
ካብ ስድርኦም ርሒቖም ንዝሰርሑ መማህራን ኣብ መነባብሮ ምሕጋዝ 42,1 ***Providing accommodation for teachers who are working far from school***				
ኣብ ከፍሊ ንክሉ ምምህር ምስትምህር ንመማህራን ምሕጋዝ 42,2 ***Supporting teachers' practice in***				

43 ወለዲ ኣብ ምስታፍ ዘሉ ብድሆታት እንታይ እዩ ***In your opinion, what are the challenges of involving parents?***

ጽልዋ Effect

	ፈጺሙ ብደህና ኣይከነን No	ትሑት a little	ብጥሕ quite a lot	ኣዝዩ ብጥሕ very much
43,1 ተቓውሞ ካብ መማህራን *Resistance among teachers*				
43,2 ናይ ወለዲ ኣሉታዊ ተመኩሮ ካብ ቤት ትምህርቲ *Parents' negative school experiences*				
43,3 ትምህርቲ ዘይብሉም ወለዲ ምስ መማህራን ክራኸቡ ደስ ዘይብሉም *Illiterate parents do not feel comfortable to talk to teachers*				
43,4 ወለዲ ናይ ቤት ትምህርቲ ዋንነት ኣለፍነቶም ምኺኑ ዘይስምዖም *Feeling that some parents do not have control over the school*				
43,5 ቁጠባዊ እቶቶም ዘጥሽነ ኮይኖም ስለዝሰምዖም *Fear of losing economical labour*				

44. ምስ መማህራንኩም ናይ ወለዲ ተሳታፍነት ጥቕሚ ትዛራረቡሉ'ዶ *Do you discuss the definition of parental involvement with your staff?*
እወ /*Yes* ☐ ኣይፋል/*No* ☐

45. በዓላትን ካልኦት ኣገደስቲ ጉዳያት ከሀሉ እንከለዉ ዓመታዊ ካላንደር ምትዕርራያት ትገብሮዶ
Do you set calendars when possible to accommodate major community events, activities and ceremonies?
እወ/*Yes* ☐ ኣይፋል/*No* ☐
ኣብነታት ሃብ/*Please, give us some examples* _____

46. ወለዲ ኣብ ትምህርቲ ናይ ደቆም ልዑል ተራ ከምዝዛወዉቁ መምህራን ይፈልጡዶ *Do you think that your staff recognize that parents play a crucial role in their children's education?*
እወ/*Yes* ☐ ኣይፋል/*No* ☐

47. ኮሚቴ ወለዲ ተማህሮን መማህራንን ዘከይደዎ ንጥፈታት ጥቐስ። *Please, specify the activities of the PTSA in your school.*

48. ናይ ወለድን ቤት ትምህርትን ኣኼባ ኣብ ዓመት ክንደይ ግዜ ይካየድ *How often do you hold parents-school conferences?*

ፈጺሙ ኣይካየድን /*never*	☐	ሓደ ግዜ ኣብ ዓመት *once a year*	☐
ሰለስተ ግዜ ኣብ ዓመት *three times a year*	☐	ኣርባዕተ ግዜ ኣብ ዓመት *four times a year*	☐
ሽዱሽተ ግዜ ኣብ ዓመት *six times a year*	☐	ሸውዓተ ግዜ ኣብ ዓመት *seven times a year*	☐
ክልተ ግዜ ኣብ ዓመት *twice a year*	☐	ሓሙሽተ ግዜ ኣብ ዓመት *five times a year*	☐
		ሸሞንተ ግዜ ኣብ ዓመት *eight times a year*	☐

49. ካብ ምዱብ ናይ ስራሕ ግዜ ወጻኢ ኣብ ቤት ትምህርትኹም ንወለዲን ንማሕብረ ሰብ ንክጥቀመሉ ክፉት ድዩ *Is your school building open for use by parents and community after school hours?*

ፈጺሙ *never*	☐	ሳሕቲ *sometimes*	☐	ብዙሕ ግዜ *quite often*	☐
				ኩሉ ግዜ ኣብ ዝደለየሉ *always when needed*	☐

50. ናይ ወለዲ ተሳታፍነት ኣብ ቤት ትምህርትካ/ኺ/ኺ ንምምሕያሽ እንታይ ክግበር ኣለዎ። *What needs to be done in order to improve the involvement of parents in your school?*

	ፈጺሙ ኣይሕግዝን not at all	ቅሩብ a little	ብጥሕ Quite a lot
ኩነታ ናይ ወለዲ ምርዳእ 50,1 *Understanding the nature of parents*			
ናይ ርክባት ኣገባብ ምፍጣር 50,2 *Establishing communication channels*			
ብዛዕባናይ ወለዲ ተሳታፍነት ቀጻሊ ንምጉም ምክያድ 50,3 *Conducting continuous assessment*			

ስፖርታዊን ባህላውን ንጥረታት ምክያድ 50,4 ***Having sports and cultural events*** 50,5 ካልእ እንተሉ ***Other what*** _____			

F. ባህሊ ቤት ትምህርቲ *School Culture*

51. ኣብ መጀመርታ ማዜ ኣብ ቤት ትምህርትኻ ዝመጽእ ሰብ ብዘዕባ ሃዋህው ናይ ቤቲ ትምህርትኻ/ኺ እንታይ ይዕዘብ?
What do you think people coming to visit your school notice first about your school atmosphere?

52. ባህሊ ቤት ትምህርትኻ/ኺ ብመንጽር ቀሪቦም ዘለዉ ሓሳባት ብምዝመጅ ከመይ ትግምግሞ?
How would you evaluate the culture of your school in relation to the following statements?

		ፈጺሙ ዮለን not at all	ቁሩብ a little	ብዙሕ quite a lot	ኣገዳሲ ብዙሕ very much
52,1	ተሳትፎ መማህራን ኣብ ምድላው ውጥን ምዕባለ ቤት ትምህርቲ ይሳተፉ ። ***Teachers participate in the preparation of school development plans***				
52,2	መማህራን ኣብንዳያት ቤት ትምህርቲ ኣብ ውሳኔ ይሳተፉ ። ***Teachers participate in the decision making affair of the school***				
52,3	ናይ ምትሕግጋዝ መጋረስ ኣብ ቤት ትምህርትና ልሙድ እዩ ። ***Collaborative activities are very common in my school***				
52,4	መማህራን ካብ ላዕለዎት ሓለፍቶም መልስ ፅንጋሎ ይረኽቡ ። ***Teachers get feedback from their higher officials in the school***				
52,5	ኣብ ቤት ትምህርትና ኣብ መንነ መሳርሕቲ ምክብባርን ስኒትን ኣሉ። ***Harmony and respect of colleagues are positive in my school***				
52,6	ተማሃሮ ኣብ ምሕደራ ቤት ትምህርቲ ይሳተፉ ። ***Students participate in the Management of the school***				
52,7	ወለዲ ኣብ ምሕደራ ቤት ትምህርቲ ይሳተፉ ። ***Parents involve in the management activity of the school***				
52,8	ምምሕዳራዊ ቅርጺ ቤት ትምህርቲ ንመማህራን ስርሖም ብግቡእ ንከሰላሱሉ የኽእሎም። ***Structure of the school enables teachers to perform the job well***				
52,9	ምምህርን ምስትምህር ንምስልጣል መማህራን ድርኺትን ምትብባዕን ኣለዎም። ***Teachers are inspired and motivated to facilitate teaching and learning in the school***				
52.10	መማህራን ኣብ ስርሖም ዘሰላስልዎ ንጥረታት ኣብ ስሩዕ እዋን ጸብጻቦም ይህቡ። ***Teachers report the activities performed in the school regularly***				
52.11	ከም ሓላፊ ቤት ትምህርቲ ካብ መማህራን ዝተፈለየ ሞያዊ ክብርታት ኣሊኒ። ***As a principal my professional values differfrom those of my teachers***				

53. ከም ሓላፊ ቤት ትምህርቲ ኣብዚኦም ዝስዕቡ ክሳዕ ክንደይ ማዜ ትንጥፍ? ***How often do you involve yourself in the following?***

	ፈጺሙ never	ሳሕቲ Sometimes	ብዙሕ quite often	ኣዘውቱ ብዙሕ very often
53,1 ሓፈሻዊ ናይ ሙምህራን ኣኼባ ***Whole staff meetings***				
ኣኼባ ምስ ናይ ምሕደራ ኣካላት				
53,2 ***Management team meetings***				
53,3 ኣኼባ ምስ ሓለፍቲ ደፓርትመንት ***Department meetings***				
ስሩዕ ኣኼባ ምስ ነፍሲ ወከፍ ክፍሊታት ተማሃሮ				
53,4 ***Arranged meetings with student classes***				
ኣኼባ ብዛዕባ ውሕስነትን ድሕነትን ተማሃሮ				
53,5 ***Student welfare meetings***				
ኣኼባ ምስ ናይ ክልኦት ሓለፍቲ ኣብያተ ትምህርቲ				
53,6 ***Meetings with other school directors***				
53,7 ኣኼባ ምስ ሓለፍትኻ ***Meetings with own superior***				
ኣኼባ ምስ ኣመሓደርቲ ከባቢ				
53,8 ***Meetings with local administrators***				
53,9 ኣኼባ ምስ ወለዲ ***Meetings with parents***				

የቐንየልና

Thank You

Foundational skills

Analysis of first graders' spelling of Tigrigna pseudowords

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Abstract

This study explored elementary school learners' spelling ability in their mother tongue, Tigrigna, through a test consisting of 25 selected pseudowords. The test was conducted in four elementary schools located in Asmara. There were a total of 241 participants in this study, all of whom were 6–7 years of age. Data was analysed by using regression and correlation analysis of various background and linguistic variables. Gender, school, syllable complexity, syllable weight, gemination and syllable length were taken into account when interpreting the results. Further, the results of the pseudoword test were compared with the participants' reading comprehension test results. The correlation of these two different tests was positive.

Keywords: spelling, pseudoword, reading comprehension, first graders

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Introduction

In Eritrea, elementary education is carried out by using the learners' mother tongue where all Eritrean children from nine ethnic groups learn their elementary school subjects in their respective first languages. English is the instructional language from grade 6 onward. Using a pseudoword test to assess learners' spelling ability is a unique experience in the Eritrean context, especially for those who use Tigrigna as the medium of education. Spelling is relatively easy to learn in transparent languages (Aro, 2004), and Tigrigna is among the regularly spelt languages with a transparent and systematically consistent writing system, like the Finnish language (e.g., Lyytinen, Erskine, Kujala, Ojanen, & Richardson, 2009). In its basic definition, spelling refers to the relationship between the graphemes and phonemes of a language (Montgomery, 1997). Spelling is also referred to as the presentation, surface, secretarial, mechanical, technical, or transcription skills. Spelling is multi-dimensional (Burns, 2006) and, thus, learning the spelling of languages is not very easy; it puts a lot of demands on the learner. This is a rather more difficult task than recognising all the letters when they are present in context. Spelling requires the recall of spellings from the memory store or lexicon of the brain in exactly the correct order and the ability to construct spellings that are not stored. Learning to spell places demands on many areas of the brain, and the resulting messages have to be integrated and coordinated with the writing or transcription machinery (Montgomery, 1997).

It takes a very long time for learners to learn to spell words well (Browne, 1999). This makes it imperative for learners, especially beginners, to be given many opportunities to see the orthography of a language being used and to practise it, as mastering it is not a matter of overnight work (see Seymour, Aro, & Erskine, 2003). Learners consolidate their spelling ability as they navigate through the writing system of their language and as their awareness of written languages develops.

One of our goals in the present study was to determine if pseudoword spelling test results in Tigrigna are in line with other studies conducted in other regular languages (Seymour & Aro, 2003). The test was implemented/carried out in two different phases. To enrich the findings, the learners' pseudoword spelling skills were compared with their comprehension ability. The research holds that the spelling skill has some form of correlation with comprehension. In order to make a comparison, the results of the pseudoword spelling test were correlated with the results of the comprehension test, which was administered some time earlier.

Access to kindergarten is an added value for those children who mainly

live in cities or towns. The participants in this study all live in Asmara and are thus expected to have gone through kindergarten education. In kindergarten, the children do some literacy practices of prewriting patterns, and in some cases, they read the alphabet in their mother tongue, in addition to physical activities such as games, songs, etc. This experience, coupled with what they do in grade 1, is believed to help learners with tackling the two tests given in the present study.

The pseudowords (25 in total) were prepared with an increasing level of difficulty in terms of the number of syllables in the words. Six of the pseudowords were replicas of Tigrigna nouns, two were adjectives, and the other 17 were verbs. Seven of the verbs were imperatives, such as 'Tell her', 'Let's respect one another', etc. All of the pseudowords only differed from their real word equivalents in just one sound/syllable. Their pronunciations and their real word equivalents have been transcribed (see appendix 1).

Pseudowords

Knowledge of spelling is good for both reading and writing, and as such, good spelling knowledge is likely to lead to good reading and writing skills. In order to measure learners' spelling ability, therefore, teachers make use of real word and pseudoword spelling tests. A pseudoword is a string of phonemes or graphemes that looks like a real word, but is non-existent and meaningless in a given language. It is pseudo in the sense that it does not exist in the lexis of a language, but it follows the orthographic system of that language.

Pseudowords are almost exclusively used for test purposes rather than instructional purposes (Khalifeh, 2014). However, where they have been rarely used as instructional tools, they also have proved to be effective to a certain degree in helping with learners' decoding and reading skills (Khalifeh, 2014). Most tests that make use of pseudowords seem to focus more on reading than on writing (e.g., see Aro, 2004; Juel, 1988; Mann & Wimmer, 2002; Saiegh-Haddad, 2004; Torppa, Georgiou, Lerkkanen, Niemi, & Poikkeus, 2016). A few studies have used pseudowords to measure spelling accuracy in a language with a transparent orthographic system, such as Tigrigna. For example, Eklund, Torppa, Aro, Leppänen, and Lyytinen (2015) used a pseudoword spelling test in Finnish, which has a transparent orthography, to determine the spelling accuracy of learners with and without familial risk for dyslexia. They found that dyslexic learners with familial risk for dyslexia continuously exhibited deficiency in reading speed, and to a limited degree, in reading and spelling accuracy.

Reading Comprehension

Reading seems to elude definition (Perfetti & Stafura, 2014). Perfetti and Marron (1998) stated that there could be narrower or broader definitions

of what reading is. There is no theory of reading, because it has too many components for a single theory. There are theories of word reading, theories of learning to read, theories of dyslexia, and theories of comprehension at various grain sizes (sentence comprehension, text comprehension), appropriately targeted to a manageable part of reading (Perfetti & Stafura, 2014, p. 22).

Ghahraki and Sharifian (2005) highlighted the fact that, despite the century-long research done on reading, researchers do not share the same understanding about the nature of the skills in comprehension for both L1 and L2. They further noted that some hold the view that reading is a unitary, holistic or indivisible skill while others, such as Munby (1978) who identifies 19 reading micro skills, believe that reading is divisible in that it involves a number of subskills. Others also hold the middle ground position that early reading involves the learning of different subskills, which later develop into a whole as learners progress into skilled readers. 'According to this position, sub-skills of reading comprehension are induced and developed separately in children and later, by constant practice, they are fused into an integrated and holistic skill' (Ghahraki & Sharifian, 2005, p. 37).

Reading comprehension can be considered the product of reading a given text while the subskills are viewed as components of the overall process of reading (Liu, 2000). It is apparent that these differing views on reading will continue for years to come, and no matter what position one takes, the idea that reading is a sum of subskills seems to dominate. Thus, the current trend on the nature of reading seems to be divided into the components of decoding (word recognition) and comprehension (Liu, 2000). Test developers, based on the assumptions they hold about the nature of reading, prepare reading tests to measure whatever skills/subskills they are looking, thereby leaving their marks on the reading debate.

According to Sure Start (2005), reading comprehension comprises the following: understanding the text; engaging with the text; critically evaluating the text; monitoring one's own understanding; making decisions about which strategies will help clarify understanding; making connections with existing knowledge; and reflecting upon the response.

Word recognition as a subskill of reading comprehension and spelling as a part of reading are assumed in this study to contribute to reading comprehensions skills. The relationship between word spelling and reading comprehension is explored using correlation analysis.

Tigrigna syllabic structure

In Tigrigna, the following letters/syllables seem to be complex sounds and are envisaged as creating difficulty: pharyngeals (ዐ-ʿ& ሐ-ḥ); glottals (ሀ-h & ኣ-ə); velars (ቐ-q̱ & ኸ-k̲); dental (ጸ-ṣ); and palatal (ፅ- č & ጀ-ǧ). Some of

the sounds, such as the pharyngeals, demand more effort in the vocal tract for their production while others, such as the dental, palatal and velars, in addition to being produced with effort, are combinations of two sounds.

As can be seen from appendix 1, all of the pseudowords were multisyllabic. It is generally believed that longer words/syllables are more difficult to study or write than shorter ones.

Gemination is the doubling of a consonant (Matthews, 2007), but according to Tewolde (2002), vowels can also pass through this elongation process of sounds. 'Longer duration of identical segments, or adjacent consonants or vowels that are the same can form gemination' (Tewolde, 2002, p. 42). In Tigrigna, gemination brings about changes in the meaning of some words, and because geminated sounds are represented by one letter in the Tigrigna orthography, speakers stumble over pronunciations while reading when they encounter words with geminations. It is only by making use of the context that they get the correct pronunciation. The present study, therefore, hypothesises that those words with gemination (see appendix 1) will be problematic for the participants of the study.

Syllables function as organisational entities for the sequence of sounds, and they are important segments in a language (Roach, 1987). Tigrigna mostly uses a single letter or syllable symbol (commonly called fidel) to represent a syllable. Syllable weight refers to how light or heavy the syllable is. A heavy syllable consists of a syllable with a branching nucleus or rime. On one hand, a heavy nucleus (branching nucleus) means the syllable contains a long vowel or a diphthong, which signifies its duration and follows the pattern CVV (Consonant-Vowel-Vowel). On the other hand, a branching rime contains a closed syllable with one or more consonants at the end of the syllable (a coda), and it follows the pattern CVC (Consonant-Vowel-Consonant).

The research questions were as follows:

1. How does the pseudoword test function in assessing first graders' spelling skills?
2. What kind of differences, such as gender, in spelling skills are observed among first graders?
3. How does pseudoword spelling correlate with reading comprehension?

Method

Participants. The four schools involved in the present research were located in the centre of Asmara and were selected for their proximity. The schools were: Dahlak, Lalimba, Mai Tesfa and Model elementary schools.

Their sizes differ with Mai Tesfa Elementary having a total of 60 learners and Lalimba Elementary comprising a total of 271 learners. The total sample number was originally 241, but some were absent from class during one or more of the test administrations (see table 1). The plan was to include a sample of half the population in grade 1 from each of the four schools. That is, if there were two grade 1 classes in a school, one was randomly selected as a representative with all the learners in that class taking the test. However, out of the total population of 614 in all the schools, the final total sample size was 241 (39.3%).

Table 1. Demographic characteristics of students

		n	%
Gender			
	Male	120	50.8
	Female	116	49.2
	Total	236	100
Age			
	6	162	58.4
	7	69	29.1
	8	6	2.5
	Total	237	100
School			
	Dahlak	48	19.9
	Lalimba	107	44.4
	Mai Tesfa	30	12.4
	Model	56	23.2
	Total	241	100

Note. Totals differ due to missing information.

Instruments. The participants were grade 1 learners from the four aforementioned schools, and they were tested, in addition to the pseudoword spelling, for their abilities in reading comprehension. The pseudowords (25 in total) were prepared with an increasing level of difficulty in terms of the number of syllables.

All instruments were prepared by considering the content in the grade 1 textbooks in order to avoid testing children outside the expected learning outcomes of the curriculum. Specifically, before making the final set of words for the test, the test administrator consulted the grade 1 Tigrigna textbook to check which letters/syllables the students were familiar with at the particular time of the academic year when the test was administered. In doing so, the children would not be expected to write letters/syllables they did not know. As much as possible, an attempt was made to represent the seven order syllables (vowel sounds) found in Tigrigna (Î, U, I, Ã, e, ö, and â), and an attempt was also made to diversify the consonant sounds in the selected pseudowords.

Procedure. During the implementation of the pseudoword test, the test administrator first explained to the learners what they were going to do, and why and how they were going to do it. He then asked for volunteer learners to come up and write on the blackboard example pseudowords that he dictated to them. After making sure that they understood what was expected of them, the real test was delivered. Each learner was given a two-page test paper where numbers 1–25 were listed, followed by empty spaces for the learners to write the dictated pseudowords. Words were dictated one after the other, with each word repeated four times and an approximate interval of three seconds in between each repetition. After repeating a word two times, the students were given some time to write the word, and then the words were read another two times. If the learners were not able to write a particular word, the test administrator told them to simply move on to the next number. In the case of the longer words (four syllable-words), the test administrator used his fingers to show students that they had four syllables. On average, the test took approximately 30 minutes.

For the reading test, which was administered separately and earlier, the students were told to choose the sentence that best described a given picture. Before they started answering the questions, the test administrator gave them an example on the blackboard and asked volunteer learners to come up and circle the letter of their choice. After making sure that they had comprehended what to do and how to answer the questions, the test administrator instructed them to do their test. The test took, on average, approximately 20 minutes. In total, there were 25 questions and each question had three options that described a given picture. See the following example in figure 1.

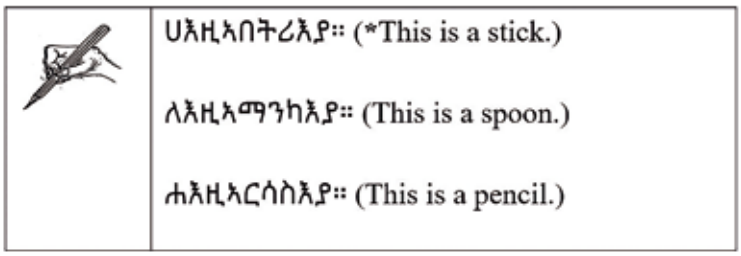

Figure 1. Reading test examble

Results

Table 2 shows the results of the 25 pseudoword spelling test items in terms

of correct or wrong parameters. To avoid any complications and interferences of unforeseen circumstances, the two raters who were responsible for correcting the test papers agreed to consider the spelling of a given word correct if it was completely free of any errors. Thus, 1 was given for a totally correct word, and 0 was given for any word that contained even a minor error in spelling one of the letters or syllable symbols.

Table 2. Pseudoword Test results

Question	n	%
1 Wrong	22	9.9
Correct	201	90.1
Total	223	100
2 Wrong	47	21.1
Correct	176	78.9
Totall	223	100
3 Wrong	53	23.8
Correct	170	76.2
Total	223	100
4 Wrong	45	20.2
Correct	178	79.8
Total	223	100
5 Wrong	36	16.1
Correct	187	83.9
Total	223	100
6 Wrong	126	56.5
Correct	97	43.5
Total	223	100
7 Wrong	108	48.4
Correct	115	51.6
Total	223	100
8 Wrong	78	35.0
Correct	145	65.0
Total	223	100
9 Wrong	70	31.4
Correct	153	68.6
Total	223	100
10 Wrong	106	47.5
Correct	117	52.5
Total	223	100

Question	n	%
11 Wrong	84	37.7
Correct	139	62.3
Total	223	100
12 Wrong	88	39.6
Correct	135	60.5
Total	223	100
13 Wrong	132	59.5
Correct	90	40.5
Total	222	100
14 Wrong	89	40.1
Correct	133	59.9
Total	222	100
15 Wrong	125	56.3
Correct	97	43.7
Total	222	100
16 Wrong	118	53.2
Correct	104	46.8
Total	222	100
17 Wrong	126	56.5
Correct	97	43.5
Total	223	100
18 Wrong	111	49.8
Correct	112	50.2
Total	223	100
19 Wrong	93	41.7
Correct	130	58.3
Total	223	100
20 Wrong	107	48.0
Correct	116	52.0
Total	223	100

Question	n	%
21 Wrong	99	44.6
Correct	123	55.4
Total	222	100
22 Wrong	84	37.8
Correct	138	62.2
Total	222	100
23 Wrong	108	48.6
Correct	114	51.4
Total	222	100
24 Wrong	106	47.7
Correct	116	52.3
Total	222	100
25 Wrong	130	58.6
Correct	92	41.4
Total	222	100

As shown in Table 2, the best result the participants of this study scored, as is generally expected with a fewer number of syllables, was on the two-syllable word kälä, where 90.1% of them wrote the correct spelling. The worst score the students achieved was on the three-syllable pseudo word sətärro (see appendix 1) with 59.5% of them spelling the word incorrectly. It was in-

teresting to see the learners find this word more difficult than other words with four syllables, complex syllables and more heavy syllables.

The 25 pseudoword spelling test items were further computed for detailed discussion, as can be seen from the regression table (table 3) below, in terms of differences in gender, school, syllable complexity, number of syllables, and the existence of gemination and heavy syllables.

Table 3. Logistic regression analysis of Pseudoword test as a function of demographic and linguistic variables

	B	S.E.	Wald	Df	p	Exp(B)
Gender	-0.13	.06	5.65	1	.017	0.88
School			60.82	3	<.001	
Lalimba	-0.16	.08	4.71	1	.030	0.85
Mai Tesfa	-0.72	.10	55.08	1	<.001	0.49
Model	-0.31	.09	12.70	1	<.001	0.74
Complexity(C vs NC)	-0.22	.06	12.09	1	.001	0.80
Number of syllables			107.87	2	<.001	
Syllables(3)	-0.73	.08	96.34	1	<.001	0.48
Syllables(4)	-0.94	.12	67.30	1	<.001	0.39
Gemination (G vs NG)	0.19	.08	5.73	1	.017	1.21
Syllable weight			32.81	2	<.001	
Heavy syllables(1)	-0.09	.07	1.68	1	.195	0.91
Heavy Syllables(2)	-0.41	.08	28.66	1	<.001	0.67
Constant	1.34	.10	168.38	1	<.001	3.83

Note. Modified logistic reagression analysis (dependent variable as repeated variable). Gender: female = 0, male = 1. Schools: Dahlak = 0 (reference category); Lalimba = 1; Mai Tesfa = 2; Model = 3. Complexity: wrong = 0, correct = 1, C = complex character, NC = non-complex character. Number of syllables: Ordinal variable taking values 2, 3 or 4. Gemination: wrong = 0, correct = 1. G = gemination, NG = no-gemination. Syllable weight: number of heavy syllables – ordinal variable taking values 0, 1 or 2.

Gender. Table 3 shows that the odds of getting a correct answer for a male student are 0.88 times greater compared to the odds for a female student, keeping the other independent variables in the model constant. In other words, female students are more likely to score higher compared to male students. The difference is significant and it can be concluded, at least for the schools studied, that females are relatively better spellers than their male counterparts. It would be too bold to conclude that female learners in general are good spellers, but the results shown in this study suggest that future studies on spelling need to consider gender as a factor.

School. Learners also showed differences according to which school they

attended. The point of departure for their comparison is Dahlak Elementary School and the results are as follows: a student in Dahlak is more likely to score higher compared to a student in Lalimba, Mai-Tesfa and Model, and the differences are significant.

In general, learners in Dahlak Elementary are better spellers followed by learners from Lalimba, Model and Mai-Tesfa. Keeping the other factors constant, the study suggests that the school environment has its own effect on the outcome of learners, in this case the spelling of pseudowords.

Complexity. The odds of getting a correct answer for a word with a complex character are 0.80 times greater compared to the odds for a word with no complex characters, keeping the other independent variables in the model constant. In other words, words with no complex characters are more likely to be answered correctly than words with complex characters. This finding seems consistent with the popular view that those letters/syllables designated as difficult, those containing the pharyngeals and velars, and those with syllables that combine two sounds are very complex. Therefore, syllable symbols with such sounds deserve extra time and effort on the part of teachers and learners for a better command. Syllabus designers also need to give such syllable symbols extra coverage in planning materials for learners.

Number of Syllables. As can be seen in appendix 1, the pseudowords comprised two, three or four syllables. The odds of getting a correct answer for a word with three syllables are 0.48 times greater compared to the odds for a word with two syllables, keeping the other independent variables in the model constant. Furthermore, the odds of getting a correct answer for a word with four syllables are 0.39 times greater compared to the odds for a word with two syllables, keeping the other independent variables in the model constant. Thus, as the number of syllables increases, it can be deduced from the result that the likelihood of a learner spelling the word correctly decreases. Once again, the findings call for more emphasis on multisyllabic words during the preparation and implementation of teaching and learning materials.

Gemination. Eighteen of the pseudowords in the test had gemination with one word having two geminating consonants (lättəššo). The odds of getting a correct answer for a word with gemination are 1.21 times greater compared to the odds for a word with no gemination, keeping the other independent variables in the model constant. In other words, words with gemination are more likely to be written correctly than words with no gemination, and the difference is statistically high. In Tigrigna, geminated sounds are represented using a single syllable symbol (compared to doubling letters in other orthographies); thus, one might expect to see learners struggling to write the correct spelling of pseudowords with geminating sounds. The result, however, proved that gemination positively contributes

to correct spelling.

Syllable weight. From table 3, it can be seen that as the number of heavy syllables increases in a word, the more likely the student is to spell the word incorrectly. The odds of getting a correct answer for a word with one heavy syllable are 0.91 times greater compared to the odds for a word with no heavy syllables, and it is statistically significant. At the same time, the odds of getting a correct answer for a word with two heavy syllables are 0.666 times greater compared to the odds for a word with no heavy syllables, keeping the other independent variables in the model constant. Here, too, the difference is statistically very significant. In other words, these results, show that heavy syllables pose difficulties for learners in spelling words correctly. If this result is viewed against the one from the existence of gemination, they look contradictory. Most of the words with heavy syllables also shared the characteristics of gemination, but they did not share the results of the geminated syllables. That is, geminated syllables eased the spelling task for the participants, but at the same time, they did not help learners in syllable weight. This seems contradictory and should be studied further.

Correlation between Pseudoword and Comprehension Tests. The comprehension test was limited to the sentence level. When the comprehension test was given in the second semester, the students would have covered more than half of the content in their textbooks where they start reading texts beyond the sentence level. Despite the poor results in the comprehension and spelling tests, analysis was done on correlating both results.

The Pearson correlation coefficient between the pseudoword spelling test and the sentence comprehension test was .58 ($p<.001$) indicating that a positive, linear and moderate correlation exists between the two variables. In other words, although not very strong, the given coefficient indicates that, as the results for a pseudoword test increase, the results for comprehension also increase.

Discussion

The study set out to find answers for the three specific questions listed earlier. For the first question, to a certain extent, the pseudoword test has shown what learners can or cannot do in spelling Tigrigna words. With a mean score of 14.71, the participants have proved that they are far from being good spellers.

For the second question, from the statistical results above, we can see that differences in gender, schools attended, syllable complexity, number of syllables and syllable weight, and the existence of gemination in words bear effects on spelling ability. According to the results, females seem to

be better spellers than their male counterparts, and learners from Dahlak Elementary were better spellers than learners in the other schools. In addition, multisyllabic words and those with complex syllables pose more difficulties for learners than those without. Gemination, however, contributed positively to the outcome of learners' pseudoword spelling. Pseudoword spelling results can also predict learners' sentence comprehension, as both tests showed positive, linear and moderate correlation.

The third research question tried to determine if testing spelling through pseudowords was relevant to Tigrigna. In general, pseudowords are mainly used to test spelling abilities for learners who use the alphabetic writing system, such as English. For Tigrigna, a language that follows the alphasyllabic orthography, the use of pseudowords to test the spelling ability of learners is a unique phenomenon. This new experience needs further research for better understanding and consolidation. However, as a testing instrument, it fitted the language well and no observable difficulties or problems were experienced. It helped to see where grade 1 learners of the particular schools lie in terms of their Tigrigna spelling ability. The study by Eklund et al. (2015) from Finland is further proof that pseudowords can be used as a testing instrument for transparent languages. The third research question also dealt with the existence or nonexistence of a correlation between the pseudoword test results and the comprehension test results. The two tests correlated linearly, positively and moderately.

In general, students' spelling ability, at least for the participants of the current study, is far from satisfactory and a lot needs to be done. However, as mentioned elsewhere in this article, when the pseudoword test papers were corrected, the raters had decided to consider only those words that were error-free as correct. Apart from the statistical analysis discussed above, a more qualitative error analysis can be done in the future to explore further angles. Some of the spelling errors were very close to the correct pseudoword spelling. Others were further away from the correct spelling of the required pseudowords. Further still, some learners left blank spaces where they did not write anything at all. An analysis of these responses has the potential to give a complete picture of the spelling of Tigrigna pseudowords.

Some students were observed replacing one syllable/letter instead of the correct one, probably because they misheard the examiner who was reading the words as they sound similar, or perhaps as a result of some noise interference because guaranteeing complete silence around the schools was not possible. For example, for test item 5, one student (Student 003) wrote 'täddäsä' instead of the correct pseudoword 'täggäsä' as the /d/ and /g/ are voiced alveolar and velar consonant sounds, respectively. This student has shown that he knows the difference between the two sounds as he correctly wrote the spelling of test item numbers 7 and 9 (qäššädä and hə**gä**rra). The last and middle syllables of the words, which are in bold, are the same

sounds that the student mixed up in test item 5, but got them right here. In other words, the error the student made is not necessarily an indication that he did not know the correct syllable or the correct spelling of the phoneme within the syllable. The same student, which was also the case with some other students, also made a similar error in that instead of writing the correct spelling of the pseudoword ʾəmmu, he wrote ʾ**u**mmu, which seems to come from the same source of not differentiating between the second and sixth order of syllables/letters in Tigrigna. Many Tigrigna speakers are observed committing this kind of error in their writing as the two syllables sound very similar.

The errors some students made were systematic in that they either wrote the real word equivalents of their pseudoword counterparts or words that rhymed with the required pseudowords, which again could be that they misheard them. For instance, Student 005, for test item 1, wrote the real word equivalent (kädä – he left) instead of the required pseudoword (kälä), which was also observed with many other students. Other similar examples were also observed in students' papers where they replaced the pseudoword həgärra with its real word equivalent nəgärra (tell her).

These are just a few examples reminding one that, upon closer analysis, additional findings can be unearthed to complement the statistical analysis. The pseudoword test has shown learners mistakenly putting one syllable for another, which might be the result of inadequate phonemic awareness exercises. More exercises on phoneme differentiation should be given to learners in order to develop their spelling abilities.

The textbook for grade 1 lacks word-level writing exercises. It mainly emphasises reading words, sentences and paragraphs. Learners can develop their spelling ability if they are provided with such activities; thus, ensuring that learners get enough spelling exercises can minimise the problems observed in the study.

Words that have complex syllables, such as the pharyngeals and velars, need special attention. Teachers should give extra time and effort when they teach such sounds.

Syllable weight and gemination also need special attention. Heavy syllables proved to be difficult for learners while words with geminated syllables tended to be helpful in spelling. Both of these factors call for attention to syllable boundary. In order to positively utilise their phonemic awareness, learners need to be acquainted with the idea of segmenting and blending phonemes/syllables. Exercises specifically aimed at parsing and combining syllables are needed as they are either missing in the textbook or inadequately given.

As with any other study, the present project has limitations that could have

changed the picture if they were avoided. The study did not include private schools; all four were government schools. In addition, the schools were very close to each other, located in the heart of Asmara, the capital. Other schools on the periphery of the city or villages could have been included for better representation. Eighteen of the pseudowords had geminated syllables, which leaves only seven of them without. Perhaps these needed to be balanced. Moreover, the dictation was done in person where variations in delivery (for example, voice clarity) between schools was unavoidable. Such variations could have been avoided or minimised if the test was recorded and delivered using a computer with headphones, as Eklund et al. (2015) did in their research.

This study is a preliminary one and the results could not be generalised to all Eritrean schools and learners. A bigger and more detailed project on the spelling test using pseudowords is needed. Such a research project could be one that compares the results of learners' spelling through pseudowords and real words, for example. This future project also needs to explore the reason(s) why learners are good or bad spellers to either consolidate the good results or rectify the problems if they happen to be unsatisfactory, as well as to see if the reasons mentioned in Allcock (2000) could manifest themselves in the Eritrean context.

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Appendix 1. Properties of Pseudoword Test

SN	PSW	PRO	RW	PRO	C	NS			G	SW	
						2	3	4		H1	H2
1	ከለ	kälä	በለ	bälä		√					
2	ሃነ	hanä	ሃበ	habä		√					
3	ናሹ	naššu	ዓሹ	ʿaššu		√			√	√	
4	እሙ	ʾəmmu	ድሙ	dəmmu	√	√			√	√	
5	ተገሰ	täggäsä	ለገሰ	läg**gä**sä			√		√	√	
6	ፈሸነ	fäššänä	ከሸነ	käš**šä**nä			√		√	√	
7	ቀሸደ	qäššädä	ቀሸሸ	qäš**šä**šä			√		√	√	
8	ብካሾ	bəkaššo	ብራሾ	bə**ra**ššo			√		√	√	
9	ሀገራ	həgärra	ንገራ	nə**gär**ra	√		√		√	√	
10	ጀበረ	ǧäbbärä	ገበረ	gäb**bär**ä	√		√		√	√	
11	ወሊሕ	wälliḥ	በሊሕ	bäl**liḥ**	√	√			√		√
12	ጋሊሙ	gallimu	ዓሊሙ	ʿal**li**mu					√	√	
13	ስጦሮ	səṭärro	ስገሮ	sə**gär**ro			√		√	√	
14	ሰሚቱ	sämmitu	ሰሚሩ	säm**mi**ru			√		√	√	
15	ለትሾ	lättəššo	ፈትሾ	fät**tə**ššo			√		√		√
16	ፈጫሲ	fäčasi	ፈሳሲ	fä**sa**si	√		√				
17	ጥሕድ	ṭəḥəd	ጥሕር	ṭə**ḥər**	√	√				√	
18	ብስራኽ	bəssəraḵ	ብስራት	bəs**sə**rat	√		√		√		√
19	ለውማት	läwmat	ለውሃት	läw**hat**		√			√	√	
20	ዋቅርባ	waqrəbba	ኣቅርባ	ʾa**qrəb**ba	√		√		√		√
21	ተከካሪ	täkäkkari	ተዘካሪ	tä**zäk**ka**ri**				√	√	√	
22	ቀሪባቆ	qäribaqqo	ቀሪባቶ	qä**ri**bat**to**				√	√	√	
23	ንድሰፈሉ	nədsäfällu	ንድረፈሉ	nəd**räfäl**l**u**				√	√		√
24	ሕርጻታት	ḥərṣatat	ሕንጻታት	ḥən**ṣa**tat	√		√				√
25	ንዘባበር	nəzzäbabär	ንከባበር	nək**kä**ba**bär**				√	√		√

Note. PSW = pseudoword; PRO = pronunciation; RW = real word equivalent; C = complexity; NS = number of syllables; G = gemination; SW = syllable weight; H1 = one heavy syllable; H2 = two heavy syllables.

Reading comprehension skills in different text types among fifth graders in Tigrigna mother tongue

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Abstract

This study examined the performance level in reading comprehension among fifth graders. More precisely, this study focused on an analysis of the text types provided in Tigrigna textbooks and the associations between reading comprehension ability in narrative and expository text types in Tigrigna. The study was conducted in four elementary schools located in Asmara. There were 249 participants, and all were approximately 10 years of age (M=10.61, SD=0.80). Study one focused on analysing different text types according to subskills in reading. This data was analysed according to qualitative theory-driven content analyses. Study two focused on the associations between different text types and subskills in reading among fifth graders. This data was analysed quantitatively. Most parts of the textbooks' texts were represented by the narrative text type. Literal subskills are the most prominent reading subskills. In reading the narrative text types, the students performed best in literal subskills. In the expository text types, the students performed best in implied subskill items. Overall, the results indicated that students performed at a higher level in the narrative texts than in the expository texts. The students also had a higher performance level in those reading skills in which they had more practice.

Keywords: reading comprehension, narrative text type, expository text type, textbooks, fifth graders

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Introduction

In Eritrea, in the elementary education cycle (grades 1–5), the medium of education is mother tongue. So, learners from the nine ethnic groups follow curricula prepared in their respective languages: Tigrigna, Nara, Saho, Tigre, Bidaawyeet, Afar, Kunama, Rashaida, and Bilen.

Eritrea has a relatively long history of putting education through the mother tongue (especially Tigrigna) into practice (Hailemariam, 2002). The decision to provide education in the elementary schools in the mother tongue has led to having three different orthographies within the same curriculum. That is, Latin is for the Bilen, Kunama, Nara, Saho, Afar, and Bidaawyeet languages, Arabic is for the Arabic language and Geez script is for the Tigrigna and Tigre languages (Asfaha, Kurvers, & Kroon, 2008). Tigrigna, along with Tigre, is one of the major languages spoken in the country (Tewolde, 2002).

According to Nuttall (1982), reading comprehension questions can be generally classified into five types: questions of literal meaning; questions involving reorganisation or reinterpretation; questions of inference; questions of evaluation; and questions of personal response. Questions of literal meaning refer to those that are straightforward and simple and which can be answered even verbatim from the text. The ability to answer such questions is the first step for learners to be able to answer more demanding questions. Questions involving reorganisation or reinterpretation are more difficult than the first type above, as these require learners to get information from different parts of the text and then assemble it together or reinterpret it. These questions help the learner to look at the text in its entirety, instead of focusing on each sentence. Terms such as 'reading between the lines' and 'implications' go hand-in-hand with questions of inference. The learners are required to find out information from a text which is not openly stated, but rather implied. Questions of evaluation are very advanced and go beyond merely understanding the text; these demand the learner to do some form of judgment of the text and the writer's ability in achieving his/her goal. They are the most sophisticated type and include literary appreciation of texts. Questions of personal response require the learner to show his/her reaction based on the text in that he/she personalises the content and expresses his/her impressions. In this case, the learner expresses personal opinions using phrases, to borrow Nuttall's (1982) words, such as 'I'm convinced', 'I'm not interested', etc. Questions of literal meaning are labelled 'reading the lines', while questions of inference are 'reading between the lines' and questions of evaluation mean reading 'beyond the lines'. Nuttall (1982) claims that most questions in textbooks represent questions of literal meaning, along with a few questions involving reorganisation or reinterpretation and a few representing questions of personal response. She also adds that questions of Types 2, 3 and 4 deserve more focus because they

force the reader to think about not just what the writer has written, but also how he or she has written it. Unless our students think about that, they are not likely to become as competent as we would like in tackling difficult texts. (Nuttall, 1982.)

Although Davis (1968) identifies eight reading skills, only four reading subskills have been pointed out as they are relevant to this research. These are: drawing inferences, which is about the meaning of a word in context; finding answers to questions answered explicitly or in paraphrase; drawing inferences from the content; and weaving together ideas in the content. Similarly, Munby (1978) presents a long list of reading micro skills. To mention a few, reading subskills are deducing the meaning and use of unfamiliar lexical items, understanding explicitly stated information, understanding information when not explicitly stated, understanding relationships between parts of a text through lexical cohesion devices, understanding cohesion between parts of a text through grammatical cohesion devices, using basic reference skills, skimming, scanning to locate specifically required information and identifying the main point or important information in discourse.

It should be noted that, as Alderson (2000) maintains, the existence of discrete skills of reading such as the above is not without its disputes and is not necessarily embraced by all scholars.

Based on the literature cited above, the present study focuses on the following subskills or questions that are relevant to the grade specified. These are: 1) literal meaning, a skill that requires a direct meaning; 2) reorganisation, a skill that demands getting meaning from different parts of a text; 3) implied, a skill that involves inferences and interpretation; 4) guessing, a skill that asks learners to determine the meaning of words with the help of context; and 5) the reference, a skill that requires understanding cohesive devices, such as pronouns.

The main objectives of the current study are to:

1. Determine what reading comprehension skills grade 5 learners who use the Tigrigna medium of education can demonstrate;
2. Investigate what reading comprehension skills are provided in learners' textbooks; and
3. Explore whether the text type (narrative and expository) influences comprehension results.

In this study, we will analyse the kinds of text types students have used in grades 1–5. We continue with an analysis of the reading comprehension level of fifth graders, according to their reading comprehension subskills.

Based on these research objectives, we set the following two specific re-

search foci. Study one focuses on the associations between different text types and subskills in reading among fifth graders. Study two focuses on analysing different text types according to reading subskills.

The research questions are as follows:

Study one:

1. How are text types represented in Tigrigna textbooks in grades 1 to 5?
2. How are the reading (comprehension) subskills represented in the Tigrigna mother tongue textbooks from grades 1 to 5?

Study two:

3. What is the level of reading comprehension of narrative texts in terms of reading subskills among fifth graders?
4. What is the level of reading comprehension of expository texts in terms of reading subskills among fifth graders?
5. Are there gender differences in reading comprehension?

Research design and methodology

Both quantitative and qualitative methods were employed to gather and analyse the data. To find answers to the research questions, the following processes were carried out:

Reading comprehension test

Two reading texts (narrative and expository) of appropriate length were given to learners to answer reading comprehension questions that put different demands on them. The decision of having two texts instead of one was taken in order to contain the intervention of text genre in the learners' outcomes. That is, it would be inconclusive to determine what learners can answer based on just one type of text. The texts were taken directly from the learners' textbook in order to keep the difficulty level age appropriate. Both texts were the last two reading exercises in the textbook. However, some amendments, such as shortening them in order for them to be finished within one hour or so, were made to the original texts so that they fit the purpose/s of the present study. However, none of the questions were taken directly from the textbook itself. Each text had 12 questions, which demanded the ability to answer questions of literal meaning, reorganisation, implied meaning, reference skills and contextual guessing. The two tests were administered on different days, with the narrative test given first because it was believed that it would be easier than the expository one. Each test was expected to be finished in about 45–60 minutes, but in reality,

each of them lapsed for approximately 15 minutes.

As shown in table 1, the students were asked 12 multiple choice comprehension questions in each of the reading comprehension tests – narrative and expository.

Table 1. Question types (subskills) in tests

	Number of questions		
Subskills	Narrative	Expository	Total
Literal	3	2	5
Quessing	2	2	4
Reference	2	3	5
Implied	4	4	8
Reorganisation	1	1	2
Total	12	12	24

We also analysed the text types and the reading comprehension questions provided in their Tigrigna textbooks from grades 1 to 5. We gave marks and analysed the data to see the students' level of reading comprehension in two different text types in general, and their ability to answer questions that demand different kinds of skills. The reason is that, as proved in recent research, the subskills and the text types affect the readers' performance considerably (Dennis, 1982; Lumley, 1993).We used both data to answer our research questions.

The overall results for both the narrative and the expository tests were far from satisfactory as shown in tables 5 and 6 below. The mean score for both tests and individually remained at around 0.5 or 50%.

School background and sampling

The schools involved in the study are located in the centre of Asmara, the capital for convenience sake within a kilometre of distance between them. All of them are governmental schools and are elementary and junior schools of varying sizes as shown in table 2.

Table 2. End semester test results of the students in their respective schools

	Passed				Failed			
School	M	F	Total	%	M	F	Total	%
Model	58	60	118	96.7	2	2	4	3.3
Lalimba	87	190	277	97.5	2	5	7	2.5
Dahlak	90	92	182	92.4	9	6	15	7.6
Mai Tesfa	26	37	63	96.9	2	-	2	3.1
Total	261	389	640	95.9	15	13	28	4.1

Note. M=male, F=female

Participants

Out of this total number of 668 learners in the four schools, a sample of 249 participated in the present study. There were 129 males (51.8%) and 120 females (48.2%), and 54.2% were 10 years of age (M=10.51, SD=0.80).

Results

Document analysis

The Tigrigna textbooks at the elementary level (grades 1–5) have been analysed to look for activities that demand different reading skills from learners. The 2004 document produced by the Department of General Education under the Ministry of Education (MOE) outlines the expected learning outcomes that Eritrean learners at the elementary level are expected to achieve in their mother tongues in all of the language skills (see Appendix). The following are some of the expected learning outcomes from all five grades that are found to be relevant to the present study.

The Department of General Education supplies schools with textbooks and teachers' guides. The textbook is compulsory material for all grades and the subjects taught in the classroom. It depicts the curriculum areas that need to be covered in order to attain the expected learning outcomes. It incorporates different designed activities that have to be completed within the allotted time according to the students' grade level. As a result, teachers' lesson plans are expected to cover the contents and help their students use the textbooks to achieve the expected outcomes effectively in the allotted academic year. The teacher's guide also gives teachers guidance on practical areas of learning and teaching, including classroom management, pair or group work, and assessment and testing. It gives them detailed suggestions

for using the units and lessons in the textbook effectively. In addition to these, it shows teachers how to deal with lessons in relatively detailed steps.

When we analyse the reading comprehension questions provided in the textbooks for grades 1–5 in Tigrigna, it is assumed that the students have developed the various skills with the help of the different text types provided. As indicated in table 3, the students have started to become familiar with different text types from the earliest grade, i.e. grade 1. For example, in grade 2, they encounter four different text genres – descriptive, narrative, persuasive and expository. These text types make 5.1%, 84.6%, 2.6% and 7.7%, respectively, of the reading found in that grade. The narrative text type takes the lion's share. In that vein, students are expected to perform well in narrative text types as they practice more of this type, although the question types for subskills also have a great impact on the students' overall comprehension ability.

To a varying degree, students from grades 1 to 5 become familiarised with these five different text genres. They are expected to have read narrative (61.7%), expository (18.3%), descriptive (15.7%) and argumentative (3.5%) text types throughout the elementary level. At the very least, they must have read a persuasive text that makes up 0.8% of the elementary curriculum in Tigrigna. As a result, they are expected to perform well in the narrative text type because they have spent much of their reading time with this type of text. Research has also confirmed that this type of text is the easiest for readers to visualise in their mind (Dennis, 1982; Nuttall, 1982), and as it is stratified hierarchically in the first layer of comprehension, it does not require deep thinking on the reader's part to comprehend. Argumentative and persuasive text types, however, are not practiced as much as needed in their instructional time. The students have only practiced these two types to a lesser degree (3.5% and 0.8%, respectively) in the whole cycle of their elementary schooling.

Students have spent more of their instructional time on reading, and precisely the narrative text type, during their time at the elementary level. So, they are expected to perform well or score higher results with this type than the other type. Basically, learning is practicing. The more they practice something, the more they are expected to achieve. This was evident from their scores in the narrative and expository tests, as they scored 52% in the former and 44% in the latter. As shown in table 3 below, the test results are congruent with the amount of time the students spend reading the two text types in school. That is, there is also a big gap between coverage of these two types of text in the learners' textbooks, with narrative comprising 60.5% and expository comprising 18.4% of the textbooks' composition.

Table 3. Text types provided in grades 1 to 5 Tigrigna textbooks

	Grade 1		Grade 2		Grade 3		Grade 4		Grade 5		Total	
Text type	n	%	n	%	n	%	n	%	n	%	n	%
Descriptive	-	-	2	5.1	4	19.0	5	16.7	7	30.4	18	15.7
Argumentative	-	-	-	-	4	19.0	-	-	-	-	4	3.5
Narrative	2	100	33	84.6	13	62.0	15	50.0	8	34.8	71	61.7
Persuasive	-	-	1	2.6	-	-	-	-	-	-	1	0.8
Expository	-	-	3	7.7	-	-	10	33.3	8	34.8	21	18.3
Total	2	100	39	100	21	100	30	100	23	100	115	100

Students' reading performance can be greatly influenced by their reading subskills and text types. These students have practiced various reading subskills in their instructional time during their study at the elementary level. An analysis of the textbooks shows that the literal reading subskill comprises 65.8% of the content coverage with guessing the meaning of words, implied meaning, reorganisation and reflection subskills making up 10.4%, 11.5%, 7.1% and 3.0% of the coverage, respectively (see table 4 below). These numbers suggest that the students have practiced these subskills very much.

Table 4. Reading subskills in the Tigrigna mother tongue textbooks from grades 1 to 5

	Grade 1		Grade 2		Grade 3		Grade 4		Grade 5		Total	
Text type	n	%	n	%	n	%	n	%	n	%	n	%
Literal	-	-	223	76.4	83	61.9	130	59.4	101	60.1	537	65.8
Guessing	-	-	30	10.3	7	5.2	24	11.0	24	14.3	85	10.4
Reference	-	-	-	-	-	-	-	-	-	-	-	-
Implied	-	-	15	5.1	15	11.2	40	18.3	24	14.3	94	11.5
Reorganisation	1	33.3	7	2.4	22	16.4	18	8.2	10	5.9	58	7.1
Irrelevant	-	-	17	5.8	1	0.7	-	-	-	-	18	2.2
Reflection	2	66.7	-	-	6	4.6	7	3.2	9	5.4	24	3.0
Total	3	100	292	100	134	100	219	100	168	100	816	100

From an analysis of the textbooks, one gets the impression that they have spent more of their reading time answering questions of literal meaning. This is because the questions for literal meaning ask the reader about surface level information and are supposed to be asked in the lower level for beginner readers. Similarly, it could also be deduced that students have practiced questions that require surface level information, such as guessing the meaning from context and reorganisation. However, they have never practiced questions that demand the reference reading skill in the elemen-

tary cycle. They have also practiced questions that need deep thinking from the reader, such as implied and reflection reading subskills. Both of these two subskills are supposed to be asked of experienced readers, as they need detailed and careful thinking from the reader. They have practiced such types of questions starting from the lower grade, i.e. grades 1 and 2. As a result of this practice, the students performed well in the exam in the literal meaning in both text types. Their scores are higher in implied subskills than in guessing and reorganising subskills in the narrative genre, while the same is true in guessing, reorganisation and reference in the expository genre. Although these skills (guessing, reorganisation and reference) are easier to teach at the basic level and students can learn them easily, no matter what the text type is, better performance is perceived in reading subskills that require extra effort from the reader. This is because they have practiced them more than the others during their instructional time since grade 1. Students have not practiced the reorganisation reading subskill enough in their textbooks as it only comprises 7.1%. As a result, they had the lowest marks for this subskill in the exam.

Narrative text

The students have practiced answering reading comprehension questions that demand different reading subskills throughout the elementary level of various text types. These reading subskills develop gradually and systematically from low level thinking to higher level thinking through the five years of learning time at the elementary level. However, their instructional time confirms that most of the comprehension questions are practically dominated by questions of low level thinking. As can also be observed from table 5 below, the students obtained 52% in the overall result of the narrative test. The low score of these reading skills has been linked to weaknesses in phonics and phonemic awareness, and this can affect both reading fluency and comprehension level. Reading skills are foundational building blocks at lower levels. If students demonstrate low reading skills at this level, this will definitely have a negative impact in their future reading ability.

In the narrative reading text, the questions were designed to ask both surface level information (namely literal, guessing and reference reading subskills) and critical thinking information (implied and reorganisation reading subskills) from the text. As can be observed from table 5 below, within the low overall result, the students performed far better in the literal reading subskill than the remaining four subskills, and this score has elevated the overall result of their reading comprehension result in general. The answers for the comprehension questions of this type were designed to be obtained relatively easily as they were explicitly given in the text. It is also confirmed from their textbooks (grades 1–5) that most classroom reading tasks focus on the literal reading subskill. So, it is not a surprise that the students performed relatively better in this skill.

Table 5. Results of the subskills in the narrative text (N=214)

Subskill	Items	M	SD
Literal	3	0.82	0.25
Guessing	2	0.51	0.32
Reference	2	0.57	0.39
Implied	4	0.55	0.27
Reorganisation	1	0.17	0.37
Total	12	0.52	0.19

The students obtained the lowest score in the reorganisation subskill. There was only one question out of 12 that asked for the reorganisation reading subskill. From this one question, which was only 8.3% of the overall questions asked, we cannot conclude whether or not the students are good in that subskill. Had there been two or more, as in the other subskills, the conclusion would have probably been different.

Nevertheless, the students' scores were average for guessing, reference and implied reading subskills (0.51, 0.57 and 0.55, respectively). Guessing words from context and reference subskills both require the students to obtain surface information, whereas the implied subskill requires critical reading of the text. This suggests that the students are at an average level of reading ability to find out information that is stated explicitly or inexplicitly in a given text in a narrative text. Their results on these subskills suggest that the students do not differ in these areas, and the demand they exert on them is balanced.

Reading subskills are classified in accordance with the ideas they convey. They are listed hierarchically according to the level of cognitive ability they demand. Literal, guessing the meaning of words from the context, reference and reorganisation reading subskills are classified under the category of low level cognitive ability. The implied subskill, however, falls into the list of higher level cognitive ability, because it demands a more in-depth analysis and processing of the information the reader obtains from the text. However, the result on this subskill was found to be slightly better than the subskills that are classified as lower level cognitive ability. This could probably be due to the time the students spent on this subskill in their instructional time.

Expository text

Learning to read in a broader sense, i.e. learning to get meaning from a text or the interaction between the reader and the writer, can be hindered or fostered by the reader variables and text variables (Alderson, 2000). Although the language used in the text variables can play a major role ei-

ther as a barrier or promoter, the content of the text, the text type, the text organisation, the sentence structure and the like also have a great impact in helping the reader understand a given text. For example, it is easier to understand a text describing real things than abstract texts. This is because abstract texts need more skilful explanations from the writer in order to make the concepts concrete and imaginable in the reader's world. However, if the writer fails to create a visual image in the reader's mind, it will not be easily or entirely understandable. As a result, researchers have claimed that expository texts are harder to process than narrative texts (Alderson, 2000).

In our second research question, the students were asked 12 items of multiple choice questions of the same subskills given in the narrative text, namely the literal, the word guessing from the context, the reference, the implied and the reorganisation subskills. The students' overall result in comprehension is not encouraging. They scored below the average, as shown in table 6, with a result of 44 out of 100. This poor result in comprehension can be attributed to different reasons. Perhaps the students have not practiced enough reading comprehension tasks of different genres in general, or maybe their mother tongue reading textbooks do not have enough content for them to practice expository texts, or the comprehension questions were not designed or set properly to the grade level in terms of age and level of difficulty. However, the analysis of the textbooks from grade 1 to grade 5 has shown that the students have been provided with enough expository texts.

Repeated reading of a text improves scores in comprehension. The question items given in their textbooks seem to be more difficult than those asked in the research questions. Nevertheless, the length and the text type, the language used in the text and the types of questions in their textbooks are not perceived to be designed well. Also, the teachers' guide does not inform the teachers about the appropriate teaching approach to follow in order to help their students learn to read.

In the expository text type, finding answers to questions that asked literal and implied meanings seemed easier for the students. This result suggests that, despite the overall poor result, the students are relatively better in those skills, which might also mean that they have practiced them more. The scores from these two types of reading subskills improved the overall test result; otherwise, the picture would have been totally different, since the students did not have satisfactory marks in the reference and reorganising subskills. In both subskills, the mean scores registered were 0.30 and 0.34, respectively. Although the guessing result seems better than these two skills, it is not yet satisfactory. It is below the average, i.e. 0.42. The results in these three reading subskills indicate that students are not in a good position to answer questions that require surface meaning. A learner is not expected to achieve a better result in questions that require higher level thinking before lower level thinking. Questions requiring lower level

thinking are expected to be studied earlier, before questions of higher level thinking are introduced. This is because they are the earliest stage of thinking and do not demand critical and deeper thinking from the reader.

Table 6. Results of the subskills in the expository text (N=237)

Subskill	Items	M	SD
Literal	2	0.54	0.37
Guessing	2	0.42	0.35
Reference	3	0.30	0.25
Implied	4	0.59	0.28
Reorganisation	1	0.34	0.48
Total	12	0.44	0.21

Analysis of the subskills in narrative and expository texts

As there is a great difference in the overall result of the readers' performance in both text types, there is a significant difference among the subskills of literal meaning, guessing the meaning of words, reference and reorganising meanings. Generally speaking, the students did not perform well in both text types. They scored 52% in the narrative text type and 44% in the expository text type. This is not a pleasing result compared to the time spent reading in their instructional time. However, comparatively speaking, higher performance was being achieved in the literal reading subskill in both text types than in the other reading subskills. The result for the narrative text was higher than the expository text type with mean results of 0.82 and 0.54, respectively. Similarly, the same trend was shown with the guessing and reference reading subskills. In guessing the meaning of words, the students scored means of 0.51 and 0.42 in the narrative and expository text types, respectively. The narrative result was better than the expository. Regarding the subskill of reference, there was a big gap in the two types of texts. The narrative mean (0.57) was by far better than the expository genre (0.30).

Performance in the reorganisation reading subskill was also unsatisfactory for both text types, even though this skill asks questions about outer surface information. Whereas the students performed better on questions that required harder effort on the part of the reader. In both text types, they scored mean results of 0.17 and 0.34 for the narrative and expository genres, respectively, for questions of reorganisation. Relatively speaking, they achieved a better result in the expository than in the narrative genre. This is the subskill where the students' result was found to be higher in the expository text type than in the narrative one. The trend is similar for implied subskill but the differecence between the means is small.

The study had two limitations. First, all the questions were of the same

format, i.e. multiple choice questions. Some other formats that could have eliminated guess work would have been instrumental in giving a good picture of the learners' abilities. Second, the questions were not balanced. For example, there was only one question on the reorganising subskill in each of the tests, which makes it difficult to generalise.

This preliminary research has tried to answer the questions raised in the research questions earlier. It has studied students' reading performance in their mother tongue. Students' reading performance can be greatly influenced by text variables, that is, the language used in the material, the sentence structure, text content, text types and the organisation of content. This research, therefore, has looked at students' performance in reading subskills and text types using a test and documenting the analysis.

The overall results in both tests were unsatisfactory. The students only achieved 52% and 44% in both reading comprehension tests. Within these low scores, relatively speaking, better performance in the overall reading ability was seen in the narrative text type than the expository one. As many researchers believe and this research confirms, expository texts are harder to process and visualise in the readers' mind than narrative text types.

A careful analysis of the textbooks for grades 1–5 suggested that students have been familiarised with five different text types since grade 1. They have also practiced many question types (such as multiple choice, matching, true/false, short answer and so on) since that grade. Most of their instructional time was also spent on reading. The contents or topics of the reading passages are varied, which can raise the students' interest in reading. Most of the topics are related to their lives. If a text is about a familiar setting, it would be more readable and interesting because it will be easier to process.

Various reading subskills have also been introduced since grade 1. Students have already been familiarised, as the analysis has shown, beyond what was asked in the exam with an additional skill of reflection. Reflection and reorganisation subskills were introduced earlier on from grade 1. The literal subskill was introduced in grade 2, and most of the comprehension questions (76.4%) provided in that grade are of this type. The students have never been left without being asked of this type, and it continues until grade 5 at the same rate. Questions of reference have never been introduced in the whole cycle of learning. As a result, they are not expected to comprehend questions of this type, although it is classified under lower level thinking and, thus, easier to comprehend. This lack of practice showed its effect on the learners' reading outcomes in the given tests. In the expository text, the learners scored poorly on this subskill. The students did not perform well, demonstrating that they cannot do well on what they have not practiced totally or partially. Questions of guessing the meaning of words, implied and reorganisation reading subskills were also practiced in their textbooks. A total of 10.4%, 11.5% and 7.1%, respectively, of all questions pro-

vided in their textbooks cover these types of questions. The students were also asked repeatedly throughout their instructional time at the elementary level to write their reflections after reading a given text. However, this was not assessed in the present study.

In general, the students did not perform well on the reading comprehension exams. Part of the problem seems to come from the lack of training on how to tackle reading comprehension tasks. During the test sessions, most students were observed reading one question at a time and answering it from the text, and they continued in this way until the end. They never grasped a global understanding of the text first. Upon seeing this practice, the test administrator advised them to first read the text as a whole before answering. But a habit is a habit! They fell back into their old habit. This needs to be rectified sooner.

Most elementary school teachers in Eritrean schools are either less trained or not trained at all. Therefore, perhaps the teachers were not good at helping the students with tackling the reading activities. The teachers' guides do not seem to help teachers in using a scaffolding reading experience (SRE) for the less able students in their reading instructional time. As Graves states, 'A scaffolding reading experience (SRE) is a set of pre-reading, during-reading, and post-reading activities specifically designed to assist a particular group of students.' The texts were not developed gradually in terms of their length. Some of passages are three or four pages long while others are not. There were even lengthy texts without any comprehension questions at all or which had irrelevant comprehension questions, i.e. they either had nothing to do with the given text or could be answered without the text by using common sense.

Although the textbooks had texts of various types, most of them were too long and the comprehension questions were too few. It has been noted that the textbooks comprised mainly reading texts of different kinds. However, availability is one thing and practicing them is another thing. There was no evidence that the students had practiced all of what is provided in their textbooks. In other words, it was difficult to confirm that the students had practiced the test types and subskill types as often as possible.

Gender Differences in Reading Comprehension

The performance of the students with respect to gender shows that female students performed better than male students on both exams. On the narrative exam, the difference in performance between the female and male students is statistically significant at the 5% level of significance, with females ($M=0.55$, $SD=0.18$) performing better than males ($M=0.50$, $SD=0.19$); $t(239)=-2.08$, $p=.039$. Similarly, on the expository exam, female students performed better than the males, but the observed p-value is a little bit higher than the 5% level of significance ($p=.057$).

Conclusions

Based on the findings of the present study, therefore, the following are recommended.

Reading is one of the skills of a language. A skill means something that is learned through doing. There is no alternative to reading other than reading itself. Therefore, teachers and students need to put in extra effort for the fulfilment of these major skills.

Teachers need to ensure that they give their learners enough reading comprehension tasks that require the use of different subskills, as reading comprehension is not only about answering questions of literal meaning.

Teachers need to receive training on how to tackle reading comprehension tasks. It was obvious that the students were unaware of how to handle reading tasks. Answering reading comprehension questions by going back and forth between questions and texts is not the best strategy.

Questions of reference and reorganisation need to be emphasised more as they were very problematic for the participants in this study.

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Appendix 1. Expected learning outcomes (MOE, 2004)

Grade 1:

TOPIC 3: READING: Word Recognition, Fluency and Vocabulary Development
Read fiction, non-fiction and poetry for pleasure and/or information; and
Discuss meanings of words and develop vocabulary through meaningful/ concrete experiences.

TOPIC 4: READING: Reading Comprehension
Use prior knowledge to anticipate meaning and make sense of texts;
Make and explain inferences from texts such as determining important ideas and causes and effects, making predictions and drawing conclusions; and
Draw conclusions from information gathered.

TOPIC 5: READING: Literary Response and Analysis
Understand a simple story structure; and
Connect ideas and themes across texts.

Grade 2:

TOPIC 2: READING: Word Recognition, Fluency and Vocabulary Development

Read classic and contemporary works;
Read a variety of genres for pleasure and to acquire information; and
Read to accomplish various purposes, both assigned and self-selected.

TOPIC 3: READING: Reading Comprehension
Use prior knowledge to anticipate meaning and make sense of texts;
Monitor his/her own comprehension and act purposefully when comprehension breaks down, using strategies such as rereading, searching for clues and asking for help;
Make and explain inferences from texts, such as determining important ideas and causes and effects, making predictions and drawing conclusions;
Produce summaries of text selections;
Distinguish different forms of texts, including lists, newsletters and signs, and the functions they serve; and
Identify text as written for entertainment (narrative) or for information (expository).

Grade 3:

TOPIC 2: READING: Reading/Word Identification, Fluency and Vocabulary Development
Read available written materials;
Read a variety of genres for pleasure and to acquire information from both print

and electronic sources;

Read to accomplish various purposes both assigned and self-selected; and

Demonstrate knowledge of synonyms, antonyms and multi-meaning words (for example, by sorting, classifying and identifying related words).

TOPIC 3: Reading: Reading Comprehension

Make and explain inferences from texts, such as determining important ideas and causes and effects, making predictions and drawing conclusions.

TOPIC 4: Reading/Literary Response and Analysis

Respond to stories and poems in ways that reflect understanding and interpretation in discussing (speculating, questioning) in writing, and through movement, music, art and drama;

Demonstrate an understanding of informational texts in a variety of ways through writing, illustrating, developing demonstrations and using available technology;

Support interpretations or conclusions with examples drawn from the text;

Connect ideas and themes across texts; and

Recognise the distinguishing features of familiar genres, including stories, poems and informational texts.

Grade 4:

TOPIC 2: READING/Word Identification, Fluency and Vocabulary Development

Read classic and contemporary works, as available;

Select varied sources such as non-fiction, novels, textbooks, newspapers and magazines when reading for information or pleasure; and

Read for varied purposes such as to be informed, to be entertained, to appreciate the writer's craft and to discover models for his/her own writing.

Sub-Topic 2.4: Reading/Vocabulary Development

Develop vocabulary by listening to selections read aloud;

Draw on experience to bring meanings to words in context, such as interpreting figurative language and multiple-meaning words;

Use available reference aids, such as dictionaries, a synonym finder and software, to clarify meanings and usage;

Determine meanings of derivatives by applying knowledge of the meanings of root words of the language in education, i.e. more likely, the MT; and

Study the meanings of words systematically, from cross-curricular content areas and current events.

TOPIC 3: READING/Reading Comprehension

Determine a text's main ideas and how those ideas are supported with details;

Summarise the text to recall, inform and organise ideas;

Draw inferences, such as conclusions or generalisations, and support them with text evidence and experience;

Answer different types and levels of questions, such as open-ended, literal and interpretative, as well as test-like questions, such as multiple choice, true-false

and short answer;

Draw conclusions from information gathered from multiple sources; and

Use compiled information and knowledge to raise additional questions and resolve unanswered questions.

TOPIC 4: READING/Literary Response and Analysis

Understand literary forms by recognising and distinguishing between various types of texts, such as stories, poems, myths, fables, tall tales, plays, biographies and autobiographies;

Analyse characters, including their traits, motivations, conflicts, points of view, relationships and the changes they undergo;

Recognise and analyse story plot, setting and problem resolution; and

Describe how the author's perspective or point of view affects the text.

Grade 5:

TOPIC 2. Reading: Word Recognition, Fluency and Vocabulary Development

Apply knowledge of letter-sound correspondences, language structure and context to recognise words;

Locate the meanings, pronunciations and derivations of unfamiliar words using dictionaries, glossaries and other sources;

Draw on experience to bring meanings to words in context, such as interpreting figurative language and multiple-meaning words;

Use various available reference aids, including a thesaurus, a synonym finder, a dictionary and software, to clarify meanings and usage;

Determine the meanings of derivatives of the respective languages by applying knowledge of the meanings of root words; and

Study word meanings systematically from across curricular content areas and through current events.

TOPIC 3: READING: Reading Comprehension

Represent text information in different ways such as in an outline, timeline or graphic organiser;

Use the text's structure or progression of ideas, such as cause and effect or chronology, to locate and recall information;

Determine a text's main (or major) ideas and how those ideas are supported with details;

Draw inferences, such as conclusions or generalisations, and support them with text evidence and experience;

Distinguish fact and opinion in various texts;

Use his/her own knowledge and experience to comprehend;

Establish and adjust purposes for reading, such as reading to find out, to understand, to interpret, to enjoy and to solve problems; and

Answer different types and levels of questions, such as open-ended, literal and interpretative, as well as test-like questions, such as multiple choice, true-false and short-answer.

TOPIC 4: Reading: Literary Response and Analysis

Read classic and contemporary works;

Select various sources, such as non-fiction, novels, textbooks, newspapers and magazines, when reading for information or pleasure;

Read for various purposes, such as to be informed, to be entertained, to appreciate the writer's craft and to discover models for his/her own writing;

Support responses by referring to relevant aspects of the text and his/her own experiences;

Connect, compare and contrast ideas, themes and issues across texts;

Understand literary forms by recognising and distinguishing between various types of texts, such as stories, poems, myths, fables, tall tales, limericks, plays, biographies, and autobiographies;

Use text organisers, including headings, graphic features and tables of contents, to locate and organise information;

Summarise and organise information from multiple sources by taking notes, outlining ideas and making charts; and

Draw conclusions from information gathered from multiple sources;

The number sense level in the Eritrean classroom – A pilot study in grade 1 and grade 5

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Abstract

Number sense development in elementary school is crucial. Therefore, the aim of this study was to investigate the number sense level and gender performance in the Eritrean context. The participants included a total of 464 students – 220 in grade 1 and 244 in grade 5. The data were collected in four selected elementary schools using a convenience sampling technique. In this study, grade 1 was selected as the focus of the study to get a picture of children's numeracy level at the beginning of five years of elementary schooling. In addition, grade 5 was selected as the focus of the study to get a picture of the impact of the curricula at the end of five years of elementary schooling. The data was analysed via the SPSS programming instrument. The results suggest that numeracy distribution was distributed along the normal curve in both grades and that no significant gender differences emerged in this sample.

Keywords: number sense, problem solving, constructivist learning theory, learner centred and interactive pedagogy

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Introduction

In relation to mathematics learning, children engage in mathematical activities in their daily lives from a very early age. They are motivated and eager to discover the world around them via play and social interactions with adults and peers close to their living environment (Aqudelo-Valderrama, 2008; Datta, 1993; Kaartinen & Kumpulainen, 2012). The role of education, therefore, is to determine children's level of reasoning and support the building of a continuum from children's informal knowledge to children's formal instruction (Cobb & Bauersfeld, 1995). In this chapter, we will discuss factors related to children's number sense development in the Eritrean context.

Number sense

According to McIntosh, Reys, Reys, Bana, and Farrell (1997), there are three strands to children's good number sense development: knowledge of and facility with numbers; knowledge of and facility with operations; and applying knowledge of and facility with numbers and operations to computational settings. In short, number sense refers to the ability to use numbers and quantitative methods as a means of communicating, processing and interpreting information. Furthermore, number sense requires the construction of a rich set of relationships among the actual geometries that exist in space and time, counting numbers in the spoken language, and formal symbols such as written numerals and operations.

In everyday and school activities, this is practiced when counting with one-to-one correspondence in a play situation using visual jigs, using familiar objects of the child's interest, and comparing groups of objects using math language, i.e. more, less, same, equal, all of which support number sense development and understanding (Bell, 2002).

Like learning in all other areas, number sense learning begins informally in the home, usually with the help of parents, siblings and tutors, and nursery school contributes through counting, songs and rhymes. As children move to primary school, they use numeracy both formally and informally within a wide range of everyday activities at school, in the playground, and in social interactions and cultural surroundings (Kaartinen & Latomaa, 2012). In addition, number sense involves the ability to compare numbers, sequence numbers in meaningful forms, relate the values the numbers represent, compute mentally, and use the appropriate strategy to understand the impact of certain operations mathematically, which are facilitated by conventional procedures, semiotic signs and symbols (Kaartinen & Latomaa, 2012). Moreover, age appropriate teaching approaches and guidance, enforcement and regular practice need to be used to instil critical and creative thinking apart from memorising mathematical algorithms and procedures (Tajul & Nor, 1992).

The interplay between learners' participation, the mediated role of mathematical tools and teacher scaffolding, positive feedback, social participation, symmetric interaction, social negotiation, sense of belonging, guiding, participation initiated by the teacher, etc. offer an environment to learn number sense and gradually to mathematisation (Kaartinen & Kumpulainen, 2012).

The core pedagogical approach to mathematisation is problem solving through which children learn basic skills and facts. Central to this process is to model and play what it is doing and learning mathematics. However, this is sometimes problematic, as has been evidenced in research literature. In the following, the questions related to problem solving will be discussed.

Problem solving

Markovits and Sowder (1994) have stated that students who are taught in the traditional way do not show an understanding of number sense in problem-solving situations involving numbers. A number of mathematics educators seemed to agree that the difficulties experienced by children in solving mathematics exercises is closely related to the development of number sense thinking (Burns, 1989). Higher level conceptual structures in mathematics depend on the core concepts that students typically acquire at the age of 5 or 6. Students whose core structure is not in place at the expected age experience serious delays, have difficulty catching up with their peers (Griffin, 2004), and continue to underperform on all measures. He has stated that three instructional principles lie at the heart of teaching number sense and the Number Worlds program: i) providing rich activities for making connections; ii) exploring and discussing concepts; and iii) ensuring an appropriate sequence of concepts.

Mere problem solving as a strategy is insufficient to change pedagogical practices. We need to also elaborate our learning theory. An applicable learning theory for the learning of mathematics is constructivist learning theory which is elaborated in the following.

Constructivist learning theory and the curriculum

The specific principles of the constructivist learning theory integrate procedural and conceptual elements (Tall & Vinner, 1981) of mathematical knowledge through an age appropriate pedagogical approach with a holistic perspective that considers the learner's interests, cognitive strategies, numerical concepts, collaboration and social interaction. This is related to the process of how humans generate knowledge and meaning from their experiences. This theoretical thinking has further developed to the pedagogical solution for mathematics teaching in which the stress is on a learner-centred and interactive approach (Gilakjani, Leong, & Ismail, 2013). According to the constructivist thinking, the regulative principle for math-

ematical discourse is to model, make visible and construct mathematical entities in mathematics classrooms. In this view, mathematics is an exercise of human intuition, not a game played with meaningless symbols. Most approaches that have grown from constructivism suggest that learning is best accomplished using a hands-on approach. Learners learn through experimentation, instead of by being told what will happen. Teachers offer support and make suggestions so that students make their own inferences, discoveries and conclusions. It is constructivism that initiated the learner-centred and interactive approach in education. As a pedagogical and administrative document, the curriculum is the sum of all ideas, values and visions transmitted through the teaching-learning process. An essential feature of the new national curriculum in the Eritrean context (as indicated in the national curriculum framework, 2008) is learner-centred and interactive pedagogy. The new national curriculum policy framework stipulated for 'broad, balanced and relevant learning provided to all students in the educational system' based on the needs and interests of the individual, which is essential for lifelong learning. From an international point of view, it has also been argued that there is a need to develop mathematics education towards instruction that is coherent, focused on central concepts in mathematics, and which is well articulated across the grades (National Association for the Education of Young Children [NAEYC]). In the Eritrean application for this thinking, there are five content areas in the mathematics curriculum, namely:

1. Numbers, operations and quantitative reasoning
2. Patterns, relationships and algebraic thinking
3. Geometry
4. Measurement
5. Statistics and probability

These content areas are also represented in the Finnish Curriculum (OPH, 2014).

The research questions posed for the study are:

1. What is the level of first grade students' number sense in the Eritrean context?
2. What is the level of fifth grade students' number sense in the Eritrean context?

Methods

In the present study, both quantitative and qualitative methods were applied. The quantitative data were collected using a numeracy test, which was arranged in four Eritrean schools. The data were collected in April 2017.

The pupils were given 100 minutes to take the tests, which were administered under supervision. The origin of the development of the numeracy test applied in this study is based on research-oriented instruction (Hannula & Lehtinen, 2005; Kaartinen & Latomaa, 2012; Koponen, 2008; Mattinen, 2006). Also, practical knowledge of numeracy testing was applied (LukiMat, n.d.). The final test was developed in collaboration with Finnish and Eritrean experts. In the first phase of test development, suitable tasks for a numeracy test were selected in the Finnish context and supporting visual pictures were attached. The pictures were selected on the basis of the nature of semiotic scaffolding (Kaartinen & Latomaa, 2012). After this phase, Eritrean experts modified the tasks as related to semiotic scaffolding in the Eritrean context. The tests for number sense level in grade 1 and grade 5 consisted of 25 items, with some of them having sub-items. The test was developed to get an idea of children's number sense level, such as number sequencing, comparing, problem solving, number sentencing and the concept of part/whole relationship (appendix 1 and 2). Altogether, 220 grade 1 pupils and 244 grade 5 pupils participated in the study by using a convenience sampling technique. Data were analysed and presented in tabular as well as graphical form.

Demographic characteristics of students in grade 1 and grade 5 indicate that there was almost equal participation in the number sense test by both male and female pupils (table 1). This shows that gender equality is maintained in Eritrean elementary school classrooms.

Table 1. Demographic characteristics of students in grade 1 and grade 5

	Grade 1		Grade 5	
	n	%	n	%
Gender				
Male	120	50.8	129	51.8
Female	116	49.2	120	48.2
Total	236	100	249	100
Age				
6	162	68.4		
7	69	29.1		
8	6	2.5		
9			1	0.4
10			135	54.2
11			83	33.3
12			21	8.4
13			9	3.6
Total	237	100	249	100

(continued)

Table 1. (continued)

	Grade 1		Grade 5	
	n	%	n	%
School				
School 1	48	19.9	52	20.9
School 2	107	44.4	106	42.6
School 3	30	12.4	30	12.0
School 4	56	23.2	61	24.5
Total	241	100	249	100

Results and discussion

In the following, the statistical data are reported and interpreted according to the students' achievement in relation to the content analysis of the tests. Parental support is also discussed.

The numeracy distribution of the data for grade 1 number sense shows a normal distribution (figure 1) with a mean value of 24.10 (out of 43) and a standard deviation of 6.97 (table 2). The other information observed from the distribution is that there were 10 very low achievers (P5 = 5th percentile), 21 low achievers (P25 = 25th percentile), 29 high achievers (P75 = 75th percentile) and 34 very high achievers (P95 = 95th percentile) out of 220 students. Twenty-one of them were missing, and 160 students (66.4 % of population) scored in the interval of one standard deviation from the mean.

The numeracy distribution of the data for grade 5 number sense shows a normal distribution (figure 2) with a mean value of 16.54 (out of 49) and a standard deviation of 8.97 (table 2). The other information observed from the distribution is that there were 57 low achievers (20th lowest percentile) and 46 high achievers (20th highest percentile) out of 244 students. This means that 60% of the population scored in the interval of one standard deviation from the mean.

Table 2. Descriptive statistics of grades 1 and 5 Early Numeracy Test results by gender

	N	M	MD	SD	Min	Max	Sknewness	Kurtosis
Grade 1								
All	220	24.10	25.00	6.97	1	40	-0.59	0.67
Male	108	23.87	25.00	7.99	1	40	-0.54	0.24
Female	109	24.55	25.00	5.69	8	39	-0.54	0.85
Grade 5								
All	236	16.54	15.00	8.97	0	46	0.59	-0.05
Male	119	16.48	15.00	8.79	0	41	0.57	-0.06
Female	117	16.61	16.00	9.19	1	46	0.61	-0.02

Note. Gender of 3 first graders was not reported. There were not statistically significant differences between male and female students' means.

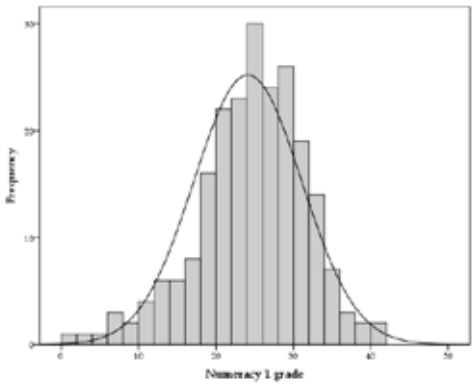

Figure 1. Distribution of 1st grade numeracy results

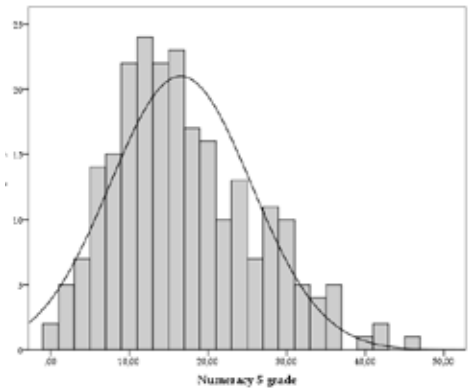

Figure 2. Distribution of 5th grade numeracy results

For the purpose of analysis, for grade 1 students, the questions were categorised in the themes of: sequencing or pattern; comparison; operations on addition and subtraction; converting word problems into mathematical sentences; part-whole relationship; and place value (table 3).

For part-whole relationship, 80% of the students answered the questions correctly. This was due to presenting the tasks pictorially.

The results suggest that the students performed well in finding the sums and differences in basic addition and subtraction problems (appendix 3, questions 12 and 18), when both addends/minuend and subtrahend were given. In that sense, their subitising ability is high, with 64. 8% of the participants answering correctly. However, when responding to the questions by how many more or less, difficulties were observed.

As number sense includes issues of comparison, questions related to comparisons were given to grade 1 students in the numeracy test. In the

comparison area, each question had two parts. After all of the students attempted the first part, some of them skipped the second part. As a result, the average of correct answers was 57%.

Another area that the children found somewhat challenging was converting word problems into mathematical sentences. As a result, they faced real challenges in addition and subtraction tasks. Their answers to questions 10 and 11 (appendix 3) depict this situation.

Table 3. Descriptives of Early Numeracy Test for first graders (N=220)

Themes	Task number	Items	KR-20 reliability coefficient	M	MD	SD
Sequencing/Pattern	1, 2, 3, 9, 22, 23	10	.56	.46	.40	.17
Comparison	4, 5, 6, 7, 14	9	.74	.57	.56	.24
Operations on addition and subtraction	8, 12, 15, 18, 24	13	.78	.65	.69	.21
Converting word problems into mathematical sentences	10, 11, 13, 16, 17	7	.65	.45	.43	.27
Part-whole relationship	19, 20, 21	3	.87	.80	1.00	.35
Place-value	25	1	-	.41	0.00	.49
Total		43	.87	.56	.58	.16

This research reveals the fact that grade 1 students have problems in skip counting. About 91.4% of them did not answer questions 2 and 3 correctly. Particularly in the item analysis, it was found that if a question had two or more parts, almost all of them only answered the first part. This can be seen from their responses to questions 4−2, 5−2, 6−2 and 7−2 shown in Appendix 1.

According to McIntosh, Reys, and Reys (1992) there are three strands to children developing good number sense: knowledge of and facility with numbers; knowledge of and facility with operations; and applying knowledge of and facility with numbers and operations to computational settings. In short, number sense refers to the ability to use numbers and quantitative methods as a means of communicating, processing and interpreting information. Furthermore, number sense requires the construction of a rich set of relationships among the actual geometries that exist in space and time, counting numbers in the spoken language, and formal symbols such as written numerals and operations.

The identification of small quantities without counting, known as subitising, appears to develop after children have had repeated practice in count-

ing, such as sets. In order for students to extend their use of subitising, it is helpful to have many different tasks by changing the arrangement of the objects in the sets (Chapin & Johnson, 2006).

For grade 5 students, in addition to those given for grade 1, writing numbers in words and numerals, and operations on fractions were included. In grade 5, students are expected to work with multi-digit numbers (table 4). About 50% of the grade 5 students correctly wrote the numerals in words. However, when asked to write the number words in numerals, the majority of them (58%) did not write these correctly (refer to questions 1 and 8 in Appendix 2). This means that students need to practice a lot to write numbers in different forms. The study conducted by the Department of General Education (DGE) in Eritrea confirms this result (MOE, 2015).

Table 4. Descriptives of Early Numeracy Test for fifth graders (N=236)

Themes	Task number	Items	KR-20 reliability coefficient	M	MD	SD
Writing numbers in words and numerals	1, 8	6	.75	.42	.33	.32
Sequencing/pattern	2, 7, 12	10	.82	.20	.17	.25
Comparison	5, 6	2	.41	.05	.00	.17
Basic operations	3, 13, 14	4	.49	.37	.25	.27
Place value	4, 9, 10, 11	13	.82	.47	.46	.25
Part-whole relationship	22	1	-	.27	.00	.44
Operations on fractions	23	4	.50	.16	.00	.25
Problem solving	15, 16, 17, 18, 19, 20, 21, 24, 25	9	.69	.27	.22	.21
Total		49	.91	.34	.31	.18

It seems that students' understanding of the concept of place value is relatively better compared to other thematic areas of number sense (47%). Still, it is not at the level expected. In writing numbers in expanded form, most of them did this incorrectly.

The students' achievement in adding and subtracting multi-digit numbers was low with the exception of one case. Specifically, this occurred when there was no exchange during the subtraction process, compare to the following question: 'In a box, there are 2584 mathematics and English books. If the number of mathematics books is 1756, how many of them are English books?'

In questions 5 and 6, in relation to comparison, students' performance was very low (5%). The questions require students to have more of a conceptual understanding on how to write the largest and smallest five-digit numbers. The inclusion of these questions in this research was to get a better picture of students' understanding of multi-digit numbers. The vast majority did not attempt these questions. The majority of them suggested that the numbers to be compared were not given. They expected the numbers to be compared to be given in the question itself, rather than having to refer to the previous exercise.

To find the missing numbers in a given sequence (when the difference can easily be detected), the students' performance was average. This does not mean that they are at an average level in sequencing. When we see the students' responses to question 7, only about 20% answered correctly. This shows students' sequencing ability using large numbers is still at its lowest level.

Rewriting word problems into mathematical sentences was a serious problem for the larger population of grade 5 students. Their answers to questions 18, 20, 21, 24, and 25 indicate that they face difficulty with relating real-life situations involving mathematical sentences. The same situation was observed in the Monitoring Learning Achievement Test III (MLA III) conducted by DGE in 2015.

In tasks related to operations in part-whole relationships, such as 'the perimeter of a square is 1 meter – find the side of the square', common errors, such as treating the addition and subtraction of fractions the same as the addition and subtraction of whole numbers, were observed. That is, while performing adding fractions with different denominators, the majority of them were adding numerators with numerators and denominators with denominators. The same procedures were applied in the process of subtraction.

There is also evidence that many students demonstrate little understanding of numerical situations in solving number problems (Burns, 1989).

Conclusions

The findings of this research indicate that the number sense level of students in both grade 1 and grade 5 is unsatisfactory. So, in order to reverse the existing situation, a lot needs to be done in the teaching/learning process. This includes revising the current curriculum, strengthening the relationship between teachers, parents and the school administration (PTA) as well as a pedagogical change. The pedagogical change needs to be done because although the learner-centred and interactive approach is

the method to be employed, the dominant practice in most of the schools is the teacher-centred approach. To bring about the required change, teachers should be given continuous updating through workshops, seminars and courses on what the learner-centred and interactive approach is and how to implement it in relation to real-life situations with mathematical concepts.

According to Bell, there is no fixed teaching approach that is successful for any class of mixed ability grouping (Bell, 2002). However, there are variety of conventional math programs and ideas that can be modified according to an individual child's profile of skills and interests. To help the child learn math concepts with meaning, the success in teaching depends largely on concrete manipulatives and visual structures and demonstrations. Within this, the connection between visual concepts, numbers and number equations and languaging the situations becomes crucial. Also, the connection between math activities and the child's representations for the real world is an important conceptual understanding. Counting with a one-to-one correspondence in a play situation using visual jigs, using familiar objects of the child's interest, comparing groups of objects using math language, i.e. more, less, same, equal, support number sense development and understanding (Bell, 2002).

To teach number sense to young children using a powerful set of tools, all schools and educational institutions need to develop strategies and appropriate pedagogies about what to teach and how to teach in the Eritrean context.

Constructivism involves the regulative principle that only mathematical entities that can be explicitly constructed in a certain sense should be admitted to mathematical discourse. In this view, mathematics is an exercise of human intuition, not a game played with meaningless symbols. Instead, it is about entities that we can create directly through mental activity.

Most approaches that have grown from constructivism suggest that learning is best accomplished using a hands-on approach. Learners learn through experimentation and not by being told what will happen. They are left to make their own inferences, discoveries and conclusions. It is constructivism that initiated the learner-centred and interactive approach in education.

The specific principles of the constructivist learning theory integrate procedural and conceptual elements (Tall & Vinner, 1981) of mathematical knowledge through an age appropriate pedagogical approach with a holistic perspective that considers the learner's interests, cognitive strategies, numerical concepts, collaboration and social interaction.

In conducting this research, a number of challenges were observed. First, the selected time period was not convenient for both the students and the

researcher as it was the mid-semester exam week. Second was problems in reading and writing in the local language, Tigrigna (in grade 1). To overcome these difficulties, the researcher administering the exam read all the items; then, afterward, students tried to give their responses. Also, the test duration caused challenges, which was 100 minutes for both grade 1 and grade 5 students. This was too much time for grade 1 students, with continuous interruptions occurring throughout the test. Some of them wanted to have a rest or go to the toilet. In such situations, the researcher needed to wait until all were back, resulting in at least 15 to 20 minutes elapsing. This was additional time that was not part of the 100 minutes. During the test, some children were doing other activities and leaving the test items aside. The grade 1 numeracy tests were given in the morning hours in all schools. However, in one school, it was conducted from 9:30 am until 11:20 am, which was found to be a difficult time to administer the test. The reason was that school buses arrived at about 11 am, so all of the students were anxious to leave. This situation created a serious problem to administer the test, because some left the exam room without finishing their tasks.

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Appendix 1. Early Numeracy Test, grade 1

1. Numbers are arranged as seen in the following table. Find the missing numbers

1	2	_____	4	5	_____	7	8	_____	10

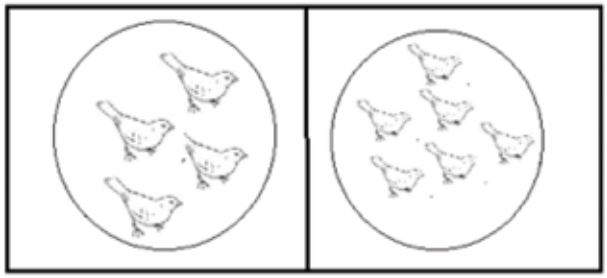
2. Numbers are arranged as seen in the following table. Find the missing numbers

2	4	_____	8	10	_____	14	16	_____	20

3. Numbers are arranged as seen in the following table. Find the missing numbers

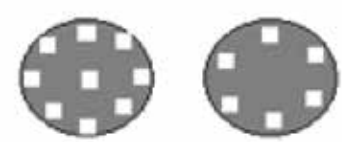
1	3	_____	7	9	_____	13	15	_____	19

4. Select the circle where there are more birds. How many more?

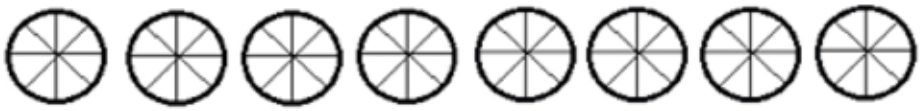


5. Select the button where there are more holes. How many more?

7. Select the button where there are fewer holes. How many less?



8. We change tyres on two bikes. Select the correct number of tyres.

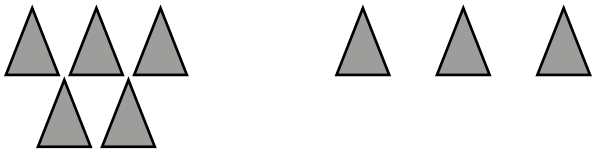


9. Continue the number sequence.

0	1	2	
5	6	7	
6	8	10	
10	20	30	
8	6	4	

10. Make a number sentence for the following situation. 'I have 6 pencils. I'll get 2 more pencils. How many pencils do I have altogether?

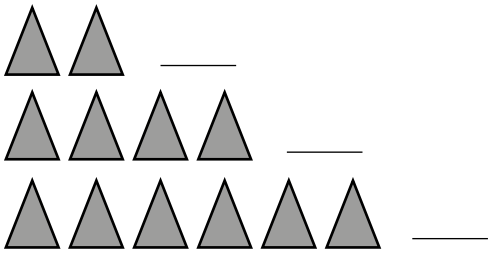
11. Make a number sentence for the following situation. 'I have 5 triangles. I'll get 3 more. How many triangles do I have altogether?



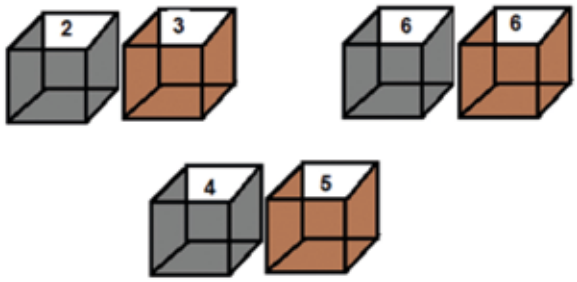
12. Add the following.

6 + 2 = _____
3 + 1 = _____
2 + 4 = _____
5 + 3 = _____

13. Altogether, there are 9 triangles. How many triangles are hidden in each case?



14. Find the biggest sum:



15. Find a number which is two more:

3	
5	
8	

Make a mathematical sentence for the following situations:

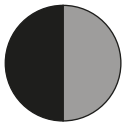
16. I have 5 bottle tops. I'll give 4 bottle tops away. How many bottle tops will I have then?

17. I have 7 buttons. I'll give 3 buttons away. How many buttons will I have then?

18. Find the results of the following operations:

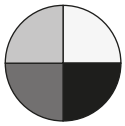
4 − 2 = _____
6 − 1 = _____
5 − 2 = _____

19. In the following picture, how many equal sizes are there?



20. How many parts of equal size are there?

21. How many parts of equal size are there?



22. Rearrange the following numbers in ascending order:

17, 5, 13, 9, 16, 8

23. Rearrange the following numbers in descending order:

24, 42, 35, 53, 19, 6, 16

24_1. Find two whole numbers whose sum is 11.

$\square + \square = \boxed{11}$

24_2. Find two whole numbers whose subtraction is 7.

$\square - \square = \boxed{7}$

25. Write in expanded form.

$\boxed{74} = \square - \square$

Appendix 2. Early Numeracy Test, grade 5

1. Write the following numbers in words:
   A. 1002005
   B. 192006
   C. 1000043

2. Arrange the numbers given in 1 in ascending order.

3. Find the difference between the largest and the smallest number given in 1.

4. By using the numbers in the following flashcards, make four different five-digit numbers:

5	1	3	6	9	4	0

5. What is the largest five-digit number that can be formed?

6. What is the smallest five-digit number that can be formed?

7. Find the missing numbers in the following table.

1000000		5000000		9000000
				8500000
7000000		7400000		8000000
		7700000		
105678		8000000		
305678				6500000
505678				
		8900000		
				5000000
		9800000		
1505678				3500000

8. Write the following number words using numerals:
   A. One hundred sixty four thousand two hundred forty five
   B. Three million four hundred six
   C. Two million nine hundred fifty one thousand

10. Write the place value for each of the following numbers:
   A. 2364591 B. 345906 C. 2587136

11. Write each of the following in expanded form:
   A. 304935 B. 4000325 C. 23545000

12. Find the missing numbers in each of the following sequences:
   A. 997, 998, 999, _____, _____, _____

B. 9997, 9998, 9999, _____, _____, _____
C. 99997, 99998, 99999, _____, _____, _____
D. 999997, 999998, 999999, _____, _____, _____

13. Add the following numbers
34809 + 246+ 8957 + 200367

14. Subtract the following numbers

A. 1349725 − 1150983

B. 47679 − 3245

15. In a box, there are 2584 mathematics and English books. If the number of mathematics books is 1756, how many of them are English books?

16. Haile's first semester total was 869. Asmerom exceeds Haile by 12 points. What is Asmerom's total?

17. A house costs 1, 465, 000. Ahmed has 749853 Nakfa. How much should Ahmed add to buy the house?

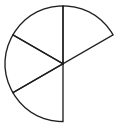
18. Nejat got 18560 Nakfa by selling her 12 sheep all at the same price. What was the selling price of each sheep?

19. In one school, there are 262 students learning in Grade 5. 148 students are girls. How many are boys?

20. Solomon has 70 goats. He sold each goat for 700 Nakfa. How much money did he get?

21. In one store, there are 6888 books. These books are distributed equally to 56 schools. What will each school's share be?

22. Which part of the whole is missing?



23. Fractional mathematical operations:

A. $\frac{5}{12} + \frac{4}{15}$ B. $\frac{1}{4} - \frac{1}{10}$ C. $\frac{9}{10} \times \frac{5}{12}$ D. $\frac{13}{121} \div \frac{39}{132}$

24. The perimeter of a square is $1\frac{3}{5}$ meters. Find the side of the square.

25. Sara bought $\frac{1}{2}$ liter of oil. She used $\frac{2}{5}$ of what she bought. How much is left?

Appendix 3. Item Difficulty Index and Item Discrimination Index of first grade students' results of Early Numeracy Test (N=220)

Item nnumber	Item Difficulty Index (% of correct answers)	Item Discrimination Index (r_{pbis} with total)
1	.96	.35
2	.08	.30
3	.08	.34
4_1	.93	.34
4_2	.36	.38
5_1	.86	.53
5_2	.25	.31
6_1	.78	.52
6_2	.36	.42
7_1	.84	.54
7_2	.20	.26
8	.63	.33
9_1	.91	.31
9_2	.91	.24
9_3	.16	.00
9_4	.51	.30
9_5	.29	.32
10	.19	.33
11	.23	.33
12_1	.91	.48
12_2	.95	.48
12_3	.92	.47
12_4	.93	.46
13_1	.59	.25
13_2	.46	.39
13_3	.44	.47
14	.56	.35
15_1	.44	.56
15_2	.42	.55
15_3	.40	.44
16	.94	.39

(continued)

Appendix 3. (continued)

Number	Item Difficulty Index (% of correct answers)	Item Discrimination Index (r_{pbis} with total)
17	.58	.41
18_1	.78	.54
18_2	.76	.58
18_3	.76	.55
19	.86	.42
20	.78	.37
21	.76	.38
22	.41	.52
23	.28	.47
24_1	.44	.41
24_2	.13	.22
25	.41	.38

Appendix 4. Item Difficulty Index and Item Discrimination Index of fifth grade students' results of Early Numeracy Test (N=249)

Item nnumber	Item Difficulty Index (% of correct answers)	Item Discrimination Index (r_{pbis} with total)
1_1	.39	.45
1_2	.40	.58
1_3	.45	.50
2	.39	.46
3	.07	.47
4_1	.51	.47
4_2	.48	.41
4_3	.47	.48
4_4	.45	.48
5	.07	.24
6	.02	.21
7_1	.15	.27
7_2	.12	.43
7_3	.23	.40
7_4	.07	.39
7_5	.20	.54
8_1	.57	.48
8_2	.34	.61
8_3	.24	.49
9_1	.18	.46
9_2	.20	.51
9_3	.18	.50
10_1	.82	.37
10_2	.78	.40
10_3	.74	.43
11_1	.35	.47
11_2	.36	.47
11_3	.27	.44
12_1	.59	.53
12_2	.44	.52
12_3	.39	.58

(continued)

Appendix 4. (continued)

Number	Item Difficulty Index (% of correct answers)	Item Discrimination Index (r_{pbis} with total)
12_4	.34	.55
13	.37	.42
14_1	.33	.44
14_2	.66	.33
15	.46	.49
16	.57	.40
17	.20	.54
18	.10	.54
19	.48	.47
20	.25	.38
21	.12	.48
22	.25	.30
23_1	.11	.33
23_2	.20	.37
23_3	.13	.30
23_4	.06	.38
24	.01	.26
25	.12	.14

Learning difficulties in literacy and numeracy learning in Eritrean context – A document analysis study

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Abstract

This study was focused on describing how learning difficulties in numeracy and literacy are identified in the Eritrean context, and the kinds of challenges that are faced within those difficulties. We also studied the teacher's role in supportive processes and, furthermore, the parents' supportive role among children who suffer from learning difficulties. This study was conducted through document analysis of educational policy papers and relevant research papers in both print and electronic form. For the main result, we replicate international findings that both the parents' and the teacher's roles are crucial. Intensive learner-centred co-operation between home and school is essential when supporting children with learning disabilities. We conclude that such partnerships should be strengthened in the Eritrean context.

Keywords: learning difficulties, literacy, numeracy, education policy, Eritrea

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Introduction

Learning difficulties refer to children who experience learning problems independent of physical and intellectual impairments (Abosi, 2007). Children with learning difficulties, however, have the ability to learn, but they require different approaches and learning support (Tomlinson, 2004). Therefore, early identification of learning difficulties in literacy and numeracy is important, because it provides a basis for the instructional planning and immediate remediation that academically weak students need to accelerate learning and prevent academic failure (Gunn & Wyatt-Smith, 2011).

In line with national development demands, in the past decades, Sub-Saharan African countries, including Eritrea, have expended considerable efforts to expand educational opportunities for all citizens. In the academic year 2013/14, for instance, enrolment in Eritrea in primary and middle school reached more than 510,000 (Ministry of Education [MOE], 2014) for the 7–14-year age group. Moreover, the Government of the State of Eritrea initiated educational reforms that envisage the provision of '. . . a broad, balanced and relevant curriculum', delivered in 'learner-centered and interactive pedagogic' (LCIP) approaches (MOE, 2008) for basic and secondary school levels. These policy guidelines also pronounce that elementary school children (grades 1 to 5) attend their schooling in their mother tongue (MOE, 2008).

However, children in both the basic and secondary school educational levels exhibit weak progression in learning achievement or outcomes and are faced with challenges. For instance, statistics show that approximately 10% of the lower elementary population repeated or failed the 2013/2014 academic year. Similarly, the overall elementary-level grade repetition figures do not significantly differ from lower levels (MOE, 2014).

The recent Monitoring Learning Achievement III (MLA) study corroborates these concerns. This study indicates that a national sample of students in grades 3 and 5, who were tested for mother-tongue (or language) literacy and mathematics, failed to attain the minimum mastery level, i.e. at least 80% of learners should attain 50% or above in each tested area according to the curriculum's defined expectations (MOE, 2016). These research results clearly show that children are faced with learning difficulties in our schools.

A multitude of factors lead to students' underachievement, which are vividly depicted in academic and practical deliberations. How to identify students who are underachieving, what counts as a factor, what are the effects, i.e. nature and extent, of the different factors, etc., have been major issues of deliberation, which have been pursued in various research approaches and theoretical lenses.

In the search for explanations, literacy and numeracy learning and respective aspects of learning difficulties have received the most attention. The growing focus on these dimensions is evident, recognising the fact that literacy and numeracy learning pose a significant barrier to achievement across the curriculum.

Apparent characterisations of 'functional' literacy and numeracy, such as reading, writing, vocabulary and computing, are strong predictors of later conventional literacy skills and success in learning other school subjects (Nag & Snowling, 2012). Research evolving from cross-linguistic inquiry and action, for instance, shows that children who struggle with reading in grade 1 would have persistent difficulties with reading in subsequent grades (Matafwali, 2010).

However, what is literacy and numeracy? Refraining from the captivating and overwhelming deliberations in defining literacy, literacy is referred to as a context-bound continuum of reading, writing and numeracy skills, acquired and developed through processes of learning and application, in schools and in other settings appropriate to youth and adults (UNESCO, 2005). Numeracy has been defined as ensuring that students are aware of the role of mathematics in the world and have the dispositions and capacities to use mathematical knowledge and skills purposefully (Australian curriculum, n.d.). What characterises literacy and numeracy education in the Eritrean context, and who are the learners deviating from the expected literacy or numeracy learning standards and to what extent? These questions remain ominously obscure in the Eritrean academics' and practitioners' discourse.

The research questions are as follows:

1. How are learning difficulties in literacy and numeracy characterised in the Eritrean context?
2. What are the challenges in identifying children with learning difficulties in literacy and numeracy in the Eritrean context?
3. To what extent are teachers aware of and support children with learning difficulties in literacy and numeracy?
4. How do the teaching and learning resources affect the education of children with learning difficulties in literacy and numeracy?
5. What is the extent of parents' school involvement in supporting the education of children with learning difficulties in literacy and numeracy?

Method

This study is a document analysis type of research using electronic and hardcopy resources. As indicated by Bowen (2009), document analysis is a

systematic procedure for reviewing or evaluating documents, both printed and electronic (computer-based and internet-transmitted) materials.

Results

Learning difficulties in literacy and numeracy

Characterising and identifying learners' learning difficulties in general, and in the context of literacy and numeracy learning in particular, provides insights into various paradigmatic and theoretical orientations and positions (Gunn &Wyatt-Smith, 2011). These insights span from those who consider the 'child as a deficit' to those who view the classroom or educational operatives as the challenges or 'deficits' that lead to the student's failure. Historically, different terms have been used around the world in reference to children faced with learning difficulties, including slow learners, specific learning disability, learning impairment, perceptually impaired, aphasic, etc. This multiplicity of terms has been a source of discussions, particularly in the discourse of developing countries' education.

In national contexts, where the orientations of the 'psycho-medical approach' inform the process of classifying needs and intervention, learning difficulties '. . . are constructed as reflecting a deficit in the ability (internal capacity) of individual students' (Gunn & Wyatt-Smith, 2011, p. 18). For instance, the re-authorised Individuals with Disabilities Education Act of 2004, IDEA (2004) in the United States (US) identifies children with specific learning disabilities as:

> ... a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, and developmental aphasia. [The] disorder ... does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

Unlike the medical model of difficulties in learning, which views these as produced by personal deficiencies (such as impairment), the social model sees difficulties in learning as arising out of an interaction between learners and the human and material resources available to support learning (Muthukrishna & Schoeman, 2000). South African education, shaped by such orientations and embracing 'socio-ecological' perspectives, exhibits a move away from categorising learners as a result of their disability to acknowledging the various factors (intrinsic and extrinsic) that create barriers

to learning and development, and hence assume:

> ... that a learning difficulty ... as mostly extrinsic in nature ... can be alleviated. Learning difficulties are only experienced in certain subjects, or certain aspects of subjects and when receiving more qualitative support from teachers the learners' achievement improves relatively quickly. A learning disability, or impairment, is primarily caused by intrinsic factors, and these learners continue to experience learning problems despite good teaching and additional support. (Nel & Grosser, 2016, p. 80)

An OECD (2003) summary of 'special educational needs' or barriers in learning in OECD countries adopts three broad cross-national categories of disabilities (category A), difficulties (B) and disadvantages (C). The construct is based on additional resources students receive to help them access the curriculum.

Disability (Category A) ... refers to educational needs of students where there is substantial normative agreement – such as blind or partially sighted, deaf and partially hearing, severe and profound mental handicap, multiple handicaps ... adequate measuring instruments and agreed criteria are available, ... considered in medical terms to be organic disorders attributed to organic pathologies (e.g. in relation to sensory, motor or neurological defects). Category C refers to educational needs of students which are considered to arise primarily from socio-economic, cultural and/or linguistic factors. There is some form of disadvantaged or atypical background for which education seeks to compensate ... Category B, refers to educational needs of students who have difficulties in learning which do not appear to be directly or primarily attributable to factors which would lead to classification as A or C.

In most Sub-Saharan African countries, the discourse of learning difficulties in the local academic and practitioners' domain is scant and sometimes fuzzy, with conceptualisations and interpretations traded inaptly (Aro, Jere-Folotiya, Hengari, Kariuki, & Mkandawire, 2011; Nel & Grosser, 2016). Thus, characterising learners' learning difficulties in general, and in the context of literacy and numeracy learning in particular in the Eritrean educational context requires consideration of many statuses. Hence, for the purpose of this study, learning difficulties are defined as the learning support needs of children, which do not appear primarily attributable to obvious organic disorders (such as sensory or motor impairments) or local contextual challenges (such as social, cultural, etc.), manifested in the low literacy and numeracy learning outcomes of the children. A complex interaction of environmental and individual constitutional processes present as the locus of these difficulties.

The International Classification of Functioning, Disability and Health (re-

ferred as ICF, http://www.who.int/classifications/icf/en) of the United Nations' World Health Organization (WHO, 2001) addresses multi-dimensionality of the consequences of disabilities or learning difficulties (figure 1). The model is extended to cover children as ICF-CY (i.e., Children and Youth (WHO, 2007). Rather than focusing on diagnosis of a child with special educational needs a more useful approach may be to view child's functional skills in his or her developmental context (Hollenweger, 2011; Simeonsson, 2009). ICF-CY is a coding schema that offers common terminology ground for different measure and assessment instruments (e.g., Adolffson, 2013).

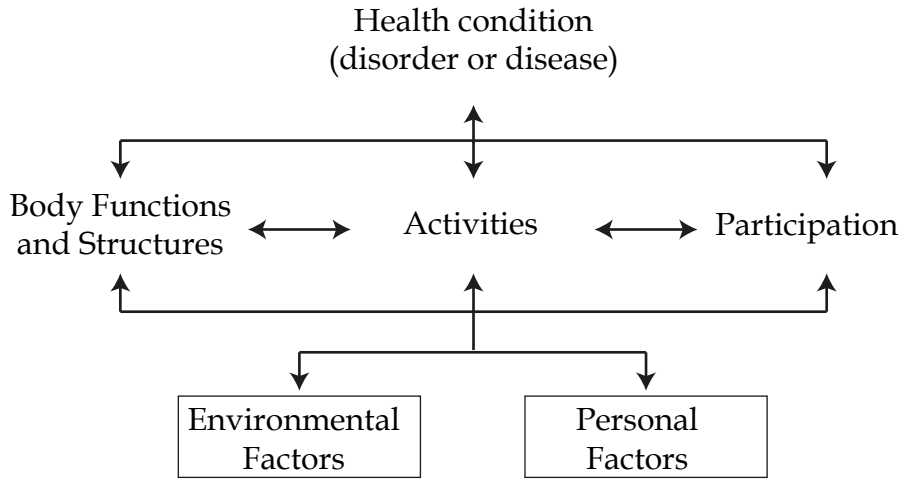

Figure 1. International Classification of Functioning, Disability and Health (WHO, 2001)

Challenges of Identifying Children with Learning Difficulties

In most Sub-Saharan African countries, the discourse of learning difficulties in the local academic and practitioners' domain is evolving (Nel & Grosser, 2016). Similarly, in the Eritrean educational context, special needs education is apparently associated with special school services for children with observable sensory impairments and a few special class arrangements in regular schools for children with intellectual and autistic impairments (see Michael, 2016). However, there is wide recognition of social, economic and cultural barriers or challenges in the educational system. Thus, identifying learners' learning difficulties in the context of literacy and numeracy learning in the Eritrean educational context requires consideration of many statuses.

On the basis of expected learning outcomes identified in the syllabi, the national curriculum guidelines propose various assessments tools and mechanisms to gather information on students' learning and development

holistically, and to assist them accordingly [intervene]. The tools include planed systematic observations, continuous assessments, and examinations. The guidelines also encourage teachers to allow ample time for assessing students for it provides the teacher with opportunities to interact with the students, to challenge and support them when necessary, and to discuss with them how they could improve (MOE, 2013). However, recognising the challenges associated with class size, time and the toll of the task in the course of continuous assessments, the following frequencies for different dimension, in the teaching-learning of the mother tongue are proposed.

If a student has not achieved a specified outcome(s), the guide advises that the teaching methods or learning activities in that process must be reconsidered and altered to help the student achieve that outcome. Providing adequate time and assistance to each student, providing 'quality feedback' in the learning process, and assigning experienced and committed teachers at the lower grades of the elementary level are recommended to improve students' outcomes (performance). However, the details of such feedback, by and large, remain administrative in orientation.

Promisingly, the guidelines recognise that the first three or four years of elementary schooling form the basis of a solid foundation on which the future of the child will depend. However, it prompts for normal progression in the lower elementary grades, presuming that:

> ... these grades outcomes that have not been achieved can still be met in the next grade with support from teachers and parents. However, students who were absent from school for a long time (due to illness, family problem, neglect by parents, displacement etc.) or students with special needs who as a result of their disabilities were unable to complete the course in due time will repeat the grade. (MOE, 2013)

Monitoring Learning Achievement III (MOE, 2016) aimed at assessing the level of performance of grade 3 and grade 5 students in the mother tongue, the English language and mathematics, including the teaching-learning environmental conditions. The mother tongue tests, for instance, covered the major skills in which learners' mastery was measured, such as vocabulary, reading comprehension, writing and grammar. The survey revealed that, by and large, children at the elementary level did not learn much of the material expected of them in the curriculum. Moreover, the study identified associations between a student's poor outcome (test underachievement) and the learner's age, language of instruction, the school's human and material resources (such as the experience and qualifications of teachers, availability of teaching aids, etc.), and the availability of textbooks and supplementary reading materials. This large-scale assessment arbitrarily considered a mark below 50% as a basis for categorising unsatisfactory achievement results. The psycho-pedagogical implications of such a cut-point, 'derived from international education indicators', remained elusive.

However, the study recommended important points in the literacy and numeracy domains within the intellectual framework of children aged 7 to 12, including the production of good quality supplementary reading materials in all Eritrean languages, and for elementary school mathematics education to consist of the acquisition and application of mathematical knowledge and mathematical thinking. Thus, teachers need to focus on developing an understanding and obtaining training in basic numeracy skills, rather than the memorisation of mechanical processes that provide little motivation for students.

A similar pilot literacy and numeracy test conducted by 'Eritrea – Learning for All' study team (2017) exhibits analogies with the MLA studies. This pilot study revealed that differences between schools and parents' educational background, as well as their involvement in the school's activities, were associated with academic achievements in literacy and numeracy among first and fifth graders. The results indicated that there were children with learning difficulties who had not achieved their learning goals. However, international literature notes that, in African countries, assessments of learning disabilities and discerning those caused by external factors is challenging (e.g., Abosi, 2007).

Teachers' Awareness of Learning Difficulties and the Support They Provide to Students with Learning Difficulties

According to UNESCO (2009), many children with learning difficulties are ignored. These children account for a large proportion of children who drop out and do not complete primary education. They have no obvious disability but may experience extreme difficulty with learning in one or more areas. In light of this, a comprehensive teacher education programme is required. Such a programme should include pre-service education, which prepares all teachers for inclusive education and with the attitudes and skills to enable them to teach all children, irrespective of their characteristics, abilities and disabilities. In addition, extensive in-service training programmes are needed to achieve a rapid increase in teachers' attitudes and competencies that are pre-requisites for successful inclusive education (UNESCO, 2009). Recent research data collected from South African primary school teachers shows that their overall knowledge of learning difficulties is still poor. According to Aro and Ahonen (2011) in Zambia, many teachers are ignorant of attention deficit hyperactivity disorder (ADHD) among their students, resulting in the teacher punishing such children instead of helping them to manage their affliction.

The above idea is based on the assumption that teachers' attitudes and expertise could be barriers to learning. Further evidence from South Africa has indicated that this lack of attitude hampers learning (Department of Education, 2002; Samkange, 2013). To address this, a holistic approach is required that calls for flexible measures in the curriculum, training teach-

ers in different special needs areas, providing appropriate materials and requisite human resources, and making these accessible to all learners. In addition, Donohue and Bornman (2014) indicated that for teachers to cope with more diverse classes, their skills need to be strengthened by building an integrated system for all, using a curriculum that is more flexible and suitable to the needs and abilities of learners. They also recommend developing district-based support teams to provide systemic support for all teachers. With regard to reading difficulties, Aro and Ahonen (2011) hold a similar view in that teachers should be equipped with the knowledge and skills to assess reading difficulties in order to be able to translate the results into more effective classroom instruction and intervention.

Teachers' attitudes could be coupled with other factors, which make them reluctant to help children with learning difficulties. One Zimbabwean case showed that in addition to the teachers' attitudes, the teacher-pupil ratio resulted in work overload; hence, when given pupils with special education needs, they sometimes became resentful towards students with learning difficulties (Samkange, 2013). In such a situation, children who are at risk, including those with learning difficulties, may not respond to teacher-directed instruction in the normal classroom setting (Aro & Ahonen, 2011). Zambian experience also indicates that most parents want their children to stay in mainstream schools, but they also realise that mainstream teachers are often too busy and pressurised to cope.

Lack of knowledge from the teachers' side makes them fail to understand that they are not alone in the process of identifying and helping students with learning difficulties. Teachers need to know that they along with psychologists need to closely examine the child's mistakes in regards to place values, numbers, borrowing, storing to memory, basic knowledge, calculations and symbols. During a learning difficulty assessment, a volume of information is gathered about the child. This information is used by the psychologist, teachers and parents to plan how to support the child in the future or to determine what possible further assessments should be made (Aro & Ahonen, 2011).

Assessment should be a comprehensive process that evaluates the child's learning difficulties and life situation extensively with several methods and with cooperation between the psychologist, family and teachers. Parents and teachers (and possibly the therapists as well) should repeatedly engage in discussions regarding the child's learning in order to monitor how well the child is progressing, and at some point, they may also feel the need to set new goals to be achieved. Especially in remote rural areas, there should be continuous capacity building and sensitisation of the special needs teachers, so that they are conscious of the challenges and needs of children with learning difficulties. They should be made aware of assessment centres where they can refer these children for further assessment and intervention.

The support that teachers are able to provide is dependent on their awareness of and attitudes towards learning difficulties, the quality of their training, the provision of both materials and resources, and the collaboration they can draw from the environment. According to the MOE and British Columbia (2011), teachers should explore the possible existence of learning difficulties when a student who appears to be capable has a history of struggling with specific components of school and/or begins to demonstrate behavioural difficulties. To do so, the teachers should be well versed in the signs and symptoms of learning difficulties.

It is important for teachers to realise that students with learning difficulties can experience success in school if appropriate support is provided. Hence, it is essential to focus on early identification and remediation, and utilising research-based, effective strategies to assist students before behavioural or emotional issues emerge. Such strategies include differentiated instruction, combining aspects of good practice to plan for students, adaptations, early intervention, direct instruction, learning strategies, ICT, and formative assessment.

In relation to this, Edulink (2011), a Finnish- and EU-funded project on learning and learning difficulties in Africa, listed several guidelines for educationalists on learning difficulties in Kenya, Namibia and Zambia. The document also addressed issues such as perception and attitude, teaching and learning strategies, assessment and intervention as well as general guidelines for teaching children with learning difficulties. This study could not find any document from the Eritrean context that explicitly addressed teachers' awareness of learning difficulties and the support they give to students with learning difficulties. Thus, this study acknowledges the gap in the literature on this topic.

Highlighting Teachers' Situation in Relation to Learning Difficulties and Accommodating Individual Differences in Classrooms

The National Curriculum Framework (MOE, 2009)

Instruction and assessment. The document indicates that the endorsement of LCIP by all teachers is an essential feature of the new national curriculum. It recommends that children and youth should be encouraged and supported to learn not only from teachers and books but also from each other and from ICT-based multi-media learning resource centres in schools (MOE, 2009).

Classroom management. The document (MOE, 2009) acknowledges that teachers face challenges with classroom management with increasing variations in learners' backgrounds. The document recommends that teachers change these challenges into opportunities for learning by planning, organising and facilitating a wide range of educational experiences and interactions.

Pre-service teacher education. The document stipulates that elementary school teachers must be able to teach grades 1–5, as classroom teaching, such as two teachers for a class, places particular demands on the professional preparation of the elementary teacher. This, in turn, requires new approaches to teacher education.

Teacher Education Curricula of the College of Education (COE) and Asmara Community College Education (ACCE) on Learning Difficulties

The only teacher education programmes that are directly linked with training teachers for the basic education are the diploma programmes of the COE and the ACCE, and the certificate programme of the ACCE. Analyses of the diploma and certificate programmes curricula indicate that no specific course is known to accommodate any topic on learning difficulties. Hence, the diploma and certificate programme graduates from the respective colleges do not obtain any training in learning difficulties, and pursue the teaching profession without any knowledge about learning difficulties.

In relation to training, the COE offers a psychology course named 'Special Needs and Inclusive Education' to the degree students of Educational Psychology and Educational Administration programmes. However, the graduates from these programmes are assigned by the MOE to high schools and health institutions as teachers, counsellors and administrators. Hence, they do not provide any form of direct support to elementary school teachers or elementary school students with learning difficulties. Elementary school teachers, therefore, do not have any form of school psychological services.

The Roles of Teaching and Learning Resources on the Education of Students with Learning Difficulties

Teaching and learning resources are materials, and physical and psychosocial resources, which include many things such as textbooks, teachers' guides, laboratories, videos and other technological resources that support the subject matter and student learning outcomes. Hence, these resources are intended to enable students to achieve the expected outcomes by making the lesson clear and tangible.

It is evident that the availability of textbooks, teachers' guides and other teaching and learning materials are of paramount importance for the realisation of school objectives. Students struggling with literacy and numeracy learning will have an opportunity to understand the lesson more easily. However, these materials, among other things, should be attractive, cost effective and appropriate for the student's age and ability level.

Although the policy of the State of Eritrea is to provide free education at the basic level and to supply textbooks on a 1:1 basis, the findings from an MLA survey indicated that this goal has not been satisfactorily met in most cases.

The study further recommended that relentless efforts must be pursued until 100% of school-age children are provided with textbooks on a 1:1 basis (MLA, MOE 2016).

World Bank (Marope, 2005) studies have pointed out serious lapses with regard to literacy levels and language learning in many Sub-Saharan African countries. The study found that the shortage of textbooks and instructional materials persists, especially in primary schools. Other than textbook shortages, inadequate instructional materials, such as student workbooks, teaching aids and enrichment materials, characterise schools. Regarding the extent of teachers' use of teaching aids and materials in Eritrea's elementary schools, the MLA III project (MOE, 2016) indicated that only a few use aids in their teaching or use them infrequently.

Contrary to the World Bank (Marope, 2005) and MOE (2016) studies stated above, recent data collected from the pilot study questionnaire of the ELFA project indicated that 74.4% of parents of low-performing students reported that they have books for their children at home. The main reason for this discrepancy could be the fact that the target schools in the study are located in areas where parents have relatively good incomes.

The other important part of learning resources is the learning environment. The learning environment not only includes the physical setting but the psychological setting as well (Tharp & Gallimore, 1988). Some students with learning difficulties are better able to concentrate and learn if changes are made to the physical conditions and infrastructure of the school. For example, a classroom should be clean, well ventilated and have enough space. With regards to a school building's condition, safety and learning space, the MLA study (MOE, 2016) generalised that most of the elementary schools in Eritrea are not child-friendly. They are overcrowded and in need of repair and maintenance. Moreover, in terms of safety, security and learning space, the availability of necessities such as clean water, toilets, etc., is far from adequate.

In order to provide effective assistance in language teaching, teachers should be well prepared and the teaching materials should be provided in sufficient quantities. However, a survey conducted by the MOE in 2002 found that, for the most part, this was not the case. Teachers received minimal instruction in how to teach reading in the mother tongue. They also had almost no supplementary materials to use in the classroom, and they lacked the training to prepare such on their own.

The study also found that the basic reading skills – reading rate, accuracy and comprehension – at all levels were somewhat weak. The primary determinant of this weakness appears to be the lack of application. Most languages in Eritrea have very little literature, so children get little reading practice during their primary education. Shortages of teaching and learning

aids were also noted, such as supplementary books, abacus, mathematical sets, etc., in the numeracy and literacy classes (MOE, 2002, p. xxv).

For students with learning difficulties, technology can be an assistive tool, replacing an ability that is either missing or impaired. Moreover, it provides the support needed to accomplish a task. For example, word processing assists students with learning difficulties in improving writing. Computers offer other support to motivate reluctant writers to write by facilitating motor actions, providing spelling assistance, helping with revising and editing, and producing a document that is neat and legible.

An assistive technology device could be a piece of equipment or product system, which is used to increase, maintain, or improve functional capabilities of individuals with learning difficulties. One example of an assistive technology is the GraphoGame. This gadget teaches letter-sound correspondences, which are the basis for the reading skill. (see Richardson & Lyytinen, 2014.)

Parental Involvement in Children's Learning

As a core of Education for All, the Dakar Framework for Action (UNESCO, 2000) considers parents among the most relevant stakeholders for quality learning. All stakeholders, including parents, need to work together to develop environments conducive to learning. A formal partnership between schoolteachers, parents (families), and communities is required, and is particularly important for excluded groups.

From the Eritrean context, two policy documents, 'Policy and Strategy of Inclusive Education in Eritrea' (MOE, 2008) and the 'The National Curriculum Framework for Eritrea' (MOE, 2009) emphasised the role of parents in the education of their children. The intended curriculum only becomes real for the learners and benefits them and the nation as a whole if the school, parents and the wider community make a concerted effort to ensure the provision of quality education for all (MOE, 2009). In relation to this, the curriculum framework is aimed at encouraging parents, caregivers and the community to provide a conducive environment and support to all children, including those with special learning needs (MOE, 2008, 2009).

According to the MOE (2009), parents can play an important role in ensuring that their children are well brought up, supporting them in doing homework, encouraging them to participate in co-curricular activities, and by participating actively in the Parent-Teacher Association and school life in general.

In line with this, Crawford and Gordon (2004) noted that parents can support classroom teachers by engaging in constructive partnerships with them. This involves establishing high but realistic expectations about the

learning and development of their children, helping teachers better understand the particular needs and strengths of their children, reinforcing the teachers' efforts in their homes, and facilitating complementary activities for their child's development in the community. Parents can share information and knowledge about instructional strategies and other supportive measures that have worked well with their children with teachers.

Epstein, Coates, Salinas, Sanders, and Simon (1997) indicated that parental involvement has five dimensions: parenting, helping with homework, communicating with the school, volunteering at school and participating in school decision-making (see also Georgiou & Tourva, 2007). In a five-year longitudinal study on parent's involvement with their children's reading learning, Sénéchal and LeFevre (2002) found some links between home experiences, early literacy skills and fluent reading. The MOE (2008, 2009) noted the school's responsibility in keeping parents informed about the curriculum, syllabuses, pedagogy and assessments, so that they know how best to support their children.

The ELFA pilot study conducted in Asmara in summer 2017, regarding the role of parental involvement in the educational performance of their elementary school children, indicates that parental involvement may bring about some differences in students' performance. The table below (table 1) indicates the quality and comprehensiveness of parental help.

Table 1. Parental help on educational performance of their children

	Results in % (positive – those who said yes)	
	Low performers	Good performers
Are there books for children in your home?	74.7	80.4
Do you read to your children often?	34.9	44.6
Does your spouse read to your children often?	37.3	40.8
Do other people read to your children?	61.4	54.3
Do you help your children with reading or writing homework?	77.1	87.3
Does your spouse help your children with reading or writing homework?	49.4	49.6
Do you help your children with math homework?	73.5	83.7
Does your spouse help your children with math homework?	47.0	47.1
How often do you meet with teachers to discuss the education of your children?	69.5	81.7
How often do you meet with the school principal to discuss the education of your children?	30.7	38.6

The results from the parents' questionnaire indicated that the parents of students with good performance provided relatively higher support to their children in literacy and numeracy than parents of low-achieving students.

Apart from a single item – 'Do other people read to your children?' – the results for all items were higher for parents' of high-achieving students.

Conclusion

This chapter addresses the learning difficulties that children face in terms of literacy and numeracy in the Eritrean context. It discusses the teachers' level of awareness about learning difficulties, the roles of teaching and learning resources to support learning difficulties, and the importance of parental involvement in children's learning.

Various documents from the Eritrean context indicated that elementary school teachers have a limited understanding about factors that hamper the learning of children who have learning difficulties. The failure of teachers to apply LCIP, problems with regard to continuous assessment, the selection and application of teaching aids, the teacher-student ratio, a lack of professional skills and knowledge about learning difficulties, and a lack of pre-service training on learning difficulties for elementary school teachers all impact teachers' awareness and attitudes. In addition, these gaps could affect the teachers' ability to identify students with learning difficulties and to know the kinds of support they should provide to meet the diverse needs of students in general and students with learning difficulties in particular. Furthermore, the documents revealed a shortage of qualified teachers in elementary schools, and disparities in the percentages of trained teachers among the zobas. The following recommendations are made towards mitigating the learning difficulties in literacy and numeracy learning in the Eritrean context:

• The MOE and the teacher education colleges need to equip classroom teachers with teaching and learning strategies, with research-based available strategies and resources that help teachers support students with learning difficulties.

• The teacher education colleges need to incorporate in their curriculum lessons on difficulties to help the prospective graduate change their attitudes and develop an understanding about the topic.

• The MOE and the school governance need to supervise and ensure that classroom teachers follow the national guidelines on assessment and LCIP use to be able to identify students with learning difficulties and provide appropriate support.

• As a multilingual nation, it is time for Eritrea to conduct studies on using assistive technology, such as GraphoGame, in elementary schools to help children with reading difficulties.

• Supplementary reading materials that allow for independent reading at a range of ability levels should be made available to all schools.

• The MOE and the schools need to work diligently to sensitise parents towards getting involved in school and after-school activities more effectively.

• Further research on learning difficulties in literacy and numeracy should be conducted.

Although issues related to learning difficulties in literacy and numeracy include many factors, this document study is limited to challenges in identifying children with learning difficulties, teacher awareness and support, resources and parental involvement. Moreover, the inherent characteristics of document studies in and of themselves have limitations, since they do not provide sufficient detail to answer a research question, and they mainly depend on data selection rather than data collection.

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Parent–Teacher partnership and support

Parental involvement in children's literacy and numeracy skill acquisition

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Abstract

This research studied the influence of parental involvement in children's skills acquisition. It was conducted in four elementary schools in the city of Asmara. The participants were 241 first graders, all of whom were approximately six years of age (M = 6.34, SD = 0.53), and their parents (N = 169). In this study, we used the parents' educational level, the availability of books for the children at home, and the frequency of school visits by parents during the school year as dependent variables to determine the impact of parental involvement and support on their children' learning. The findings showed that these variables meet the expected relationships with the children' literacy and numeracy results, although all the relationships were not statistically significant. The results indicate that parents should exert appropriate and improved procedures to support their children's learning.

Keywords: parental involvement, numeracy acquisition, literacy acquisition

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Introduction

According to numerous studies, family engagement in their children's learning is considered beneficial (Georgiou & Tourva, 2007; Henderson & Mapp, 2002; Kim, 2002; Redding, 2006). Parental involvement represents many behaviours and practices, such as parental aspirations, expectations, attitudes and beliefs regarding the child's education (Henderson & Mapp, 2002). Epstein, Coates, Salinas, Sanders, and Simon (1997) state that parental involvement has five dimensions, namely parenting, helping with homework, communicating with school, volunteering at school and participating in school decision-making.

According to Davies and Johnson (1996), the continuous worldwide political, historical and socioeconomic changes in societies have increased awareness concerning the relationship between home and school and particularly the involvement of parents in their children's education. Children's scholastic achievements are products that reflect the role of parental supportive practices. Desforges and Abouchaar (2003) maintain that good parenting at home has a significant positive effect on a child's scholastic achievement. Redding (2006) also asserts that family engagement in their children's learning is beneficial.

The relationship between parents and schools has now become a well-established partnership in the educational system (Epstein et al., 1997). Parents provide expertise and different ideas and perspectives to meet the needs of their children. Parents and families are the prime educators, and they are in the best position to know their children's needs. Parents can inform teachers about their child's capabilities, characteristics and any other special needs. Their own experiences and ideas can be joined with those by many other parents and the teachers to provide a better education and an educational start to their children's lives (Carrol, 2000).

Families and schools work hand-in-hand for the betterment of the children. The school systems acknowledge the involvement of family members in their children's educational activities. This can be revealed by a child's academic achievements, as well as his or her social and psychological well-being. As described by Desforges and Abouchaar (2003), it is widely recognised that full support from parents maximises children's potential from schooling. To take advantage of this, school systems use various mechanisms to empower parent's engagement in guiding and supporting their children in academic tasks. As stated by Desforges and Abouchaar (2003), parental involvement and support takes many forms: 'Good parenting in the home, including the provision of a secure and stable environment, intellectual stimulation, parent-child discussion, good models of constructive social and educational values and high aspirations relating to personal fulfillment and good citizenship; contact with schools to share information;

participation in school events; participation in the work of the school; and participation in school governance'(Desforges & Abouchaar, 2003, p. 4).

The quality and level of parental involvement in their children's learning can be determined by various factors. As noted by Desforges and Abouchaar (2003), the level of parental involvement differs due to numerous factors, such as social class, poverty, health, and also the parents' perceptions of their role and their level of confidence in fulfilling it. Furthermore, parental involvement may vary based on the child's achievements. When a child does better, parents are motivated to be committed to helping him or her (Georgiou & Tourva, 2007).

The present study is intended to explore the current parental involvement and support of parents in Eritrea, and the connections of the different effects on their children's achievement. The study examines certain variables that are hypothesised to have an influence on the degree of parental involvement and the supportive actions taken.

Children's school achievement is not merely dependent on teachers or the educational system at large. It is highly influenced by the involvement and supportive actions used by parents. As underscored by Hill and Taylor (2004), families and schools have worked together since the beginning of formalised schooling. Therefore, parents' engagement in their children's learning is a great help to schools.

Based on the significant role parents play in their children's learning, the present study has initiated an exploration of the situation of parents in Eritrea. This research has a driving belief that, due to various embedded variables, Eritrean parents refrain from exerting their maximum efforts to support their children and secure their future life and, particularly, their academic excellence.

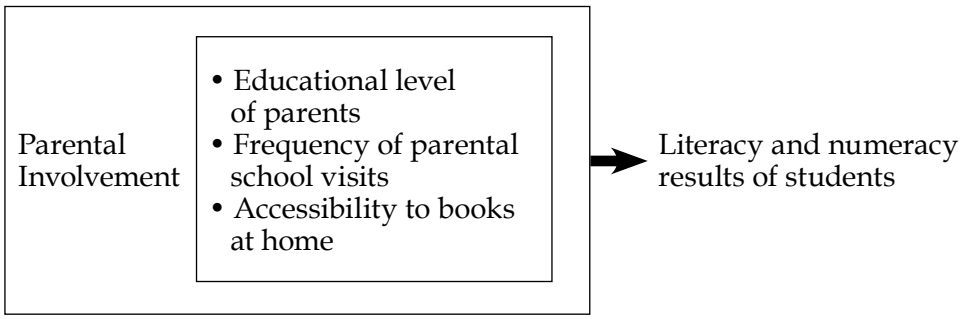

Figure 1. Conceptual framework of the study

It is no wonder that parental involvement in schools became a major educational issue in the United States (US) in the 1980s. This was an era of in-

creasing concern about the quality of education in the US. The states began to take a greater role in monitoring and maintaining academic standards. Communities were ever more watchful of the expense of public education. Local schools were concerned about continuing to provide high-quality teaching and other services with dwindling resources. In addition, parents wanted assurance that their children would receive adequate preparation to lead rewarding adult lives (Cotton & Wikelund, 1989).

The primary and natural educator of the child is the family (van Manen, 1991). Parental involvement is recognised for making a significant contribution to the quality of education. Partnerships in education are about relationships. This is evident in three essential forms of relationships, namely between children and their teachers, children and their parents and also between the parents and the teachers. In this context, parental involvement in their children's education is a major concern and known to be helpful for teachers at school (Carroll, 2000).

Carroll's (2000) study insisted on the significant role parents play in their child's development and education. The study asserted that, especially in the early years of a child' life, parental involvement is crucial to his or her education and a determinant for their later educational success or failure. Parents are a child's first educators; what they do at home with the child is of great importance and is the foundation on which all future learning is based. Carroll (2000) also maintained that there should be a tightly knit relationship between parent and child. Parents provide more individual attention at home than a teacher can in the classroom. Based on this intimate relationship, parents can have a deeper understanding of their child, and his or her needs and feelings.

Desforges and Abouchaar (2003) stated that learners' achievement and adjustment are influenced by many people, processes and institutions. Parents, the broader family, peer groups, neighbourhood influences, schools and other bodies, e.g. churches, clubs, are all supplementary in shaping children's progress towards their self-fulfilment and citizenship. The children themselves, of course, with their unique abilities, temperaments and propensities play a central role in forming and reforming their behaviour, aspirations and achievements.

Parental involvement and support. A supportive parenting style plays an important role in a child's academic, social and emotional wellbeing. It encourages conversation and an exchange between the parent and child is more conducive to emotional wellbeing during the schooling years. A supportive parenting style allows for setting limits and rules while making transparent the reasons behind decisions, thereby acknowledging the autonomy and self-responsibility of the child. Conversely, a style which is emotionally distant yet requires children to obtain high levels of academic achievement can lead to low levels of self-esteem in children, which can

have a negative impact on academic achievement (Emerson, Fear, Fox, & Sanders, 2012).

Parental involvement has been defined across studies as representing many different behaviours and practices at home or at school, including parental aspirations, expectations, attitudes and beliefs regarding their child's education (Henderson & Mapp, 2002). Epstein et al. (1997) suggested that parental involvement has five dimensions. These are parenting, helping with homework, communicating with the school, volunteering at school and participating in school decision-making.

Furthermore, Desforges and Abouchaar (2003) described parental involvement with the following ideas: 'The extent and form of parental involvement is strongly influenced by family social class, maternal level of education, material deprivation, maternal psycho-social health and single parent status and, to a lesser degree, by family ethnicity. The extent of parental involvement diminishes as the child gets older and is strongly influenced at all ages by the child characteristically taking a very active mediating role. Parental involvement is strongly positively influenced by the child's level of attainment: the higher the level of attainment, the more parents get involved' (Desforges & Abouchaar, 2003, p. 4). Furthermore, according to Desforges and Abouchaar (2003), parental involvement in the form of 'at-home good parenting' has a significant positive effect on children's achievement and adjustment. In the primary age range, the impact caused by different levels of parental involvement is much bigger than differences associated with variations in the quality of schools. The impact is evident across all social classes and all ethnic groups.

In their study, Emerson et al. (2012) mentioned that international research has shown that parental engagement (of various kinds) has a positive impact on many indicators of student achievement, including higher grades and test scores, enrolment in higher level programmes and advanced classes, higher successful completion of classes, lower dropout rates, higher graduation rates, and a greater likelihood of commencing postsecondary education (Emerson et al., 2012, p. 8).

A stimulating home learning environment, which consists of a variety of educational materials and positive reinforcement by parents about the value of education, is integral to intellectual and social development in children of all ages (Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2004). In addition to making learning enjoyable and rewarding, a quality home learning environment contributes to the standards that children set for themselves and their aspirations for education (Jeynes, 2005). Home-based involvement also includes activities that do not take place in the home per se, such as taking children to events and places that foster academic achievement. These can include museums, libraries, galleries, talks and performances (Hill & Tyson, 2009).

Emerson et al. (2012) explained that the home learning environment is formative in a child's social development and is an essential contributing factor to educational outcomes at all stages of the learning trajectory. Parents can create a home environment suitable for learning by, among other things, designating an area to do homework, providing access to reading material, and assisting with the organisation of homework and studies.

Similarly, Emerson et al. (2012) explained that parental involvement at home has a positive effect on children's achievements. Parents can communicate their expectations and educational aspirations by, for example, discussing subject selection and choices, academic aspirations and post-school pathways. Such communication represents a style of parenting that is supportive of a child's academic progress, places value on learning, and models behaviours appropriate for achievement. Furthermore, Hill and Taylor (2004) reported that parental school involvement is largely defined as consisting of the following activities: volunteering at school; communicating with teachers and other school personnel; assisting in academic activities at home; and attending school events, meetings of parent-teacher associations and parent-teacher conferences.

Parental involvement and educational level of parents. Desforges and Abouchaar (2003) reported that the educational level of parents has a positive impact on the strength of the parental involvement. In this study, parents' educational level was positively related to parent-teacher contact. The more educated the parent, the greater was their involvement in their child's education. A lack of extended personal educational experience renders a lack of relevant skills or an appropriate conception of 'parents as co-educator'.

Furthermore, Desforges and Abouchaar (2003) argued that parents' views of their role as a teacher and their degree of comfort in communicating with teachers might in part be a reflection of their own educational experience. A poor or limited personal education might leave the parent lacking in vision, confidence or competence in supporting their own child.

Similar findings from a study conducted by Baker and Stevenson (1986) indicated that parents' higher education level is positively associated with a greater tendency for them to advocate for their children's placement in honours courses and actively manage their children's education.

Parental involvement and frequency of parents' school visits. Parental engagement in their children's learning can be enhanced by confirming their participation in the school. The school should ensure that there are trusting relationships between teachers and parents. However, building trust can be challenging and may require additional effort and creativity on the part of teachers and schools (Emerson et. al., 2012).

Children can gain more from learning when parents and school staff work together to facilitate a supportive learning environment in both the home and the school. The combined effect of parental support in the home, a quality home learning environment, a positive relationship between parents and teachers, and a quality learning environment at school has been found to make a positive contribution to children's academic achievements throughout the schooling years (Henderson & Mapp, 2002).

Desforges and Abouchaar (2003) revealed that parental involvement within the school can act as a precursor to effective practices at home, and parents are more able to assist their children if they are kept informed about how they are doing in school and the best ways to encourage and motivate them to learn.

Lee and Bowen (2006) showed that the home learning environment remains critical to a child's education; a dialogue between parents and school needs to occur to keep parents informed about curricula, courses, school rules and assessments. By building this kind of communication, parents and teachers can then work together to support the child in his or her education. This dialogue can lead to conversations about optimal home learning environments that in turn benefit a child's academic pursuits. Henderson and Mapp (2002) also noted that meetings between parents and teachers commonly occur when there is a formal parent-teacher discussion about student progress, or when parents are required to meet with the school as a result of behavioural or learning problems. Such problem-focused encounters do not necessarily foster a desire for learning in children or raise their expectations of education.

For parent-teacher relationships to become more supportive, there needs to be more frequent and higher-quality interactions, which are focused on connecting parental engagement to learning goals and objectives. Such interactions are beneficial not only for parents, who over time become more attentive to their children's learning, but also for teachers, who become more aware of parents' capacity to support educational activities and outcomes (Henderson & Mapp, 2002). By ensuring conversations are positive in content and tone, parents can receive clear and consistent information from schools on how to effectively contribute to their children's learning (Emerson et al., 2012).

Consistent dialogue from the beginning of the school year between parents and the school is critical to developing and sustaining relationships that are conducive to learning outcomes. A lack of appropriate communication from schools to parents is linked to lower levels of parental engagement, particularly in lower-performing schools, and parents are more likely to engage when school personnel value, expect and invite them to be involved (Westmoreland, Rosenberg, Lopez, & Weiss, 2009).

Parental involvement and provision of learning facilities at home. Just as regular conversations between parents and children about learning are important, access to educational resources in the home has a long-lasting impact on students' outcomes (both academically and non-academically; Emerson, et al., 2012). According to Sacker, Schoon, and Bartley (2002), learning material deprivation had a strong negative effect on children' scholastic achievement. As material deprivation worsened, parental involvement decreased markedly. Material deprivation was notably worse in families with lower socioeconomic statuses. The report revealed that at age 16, the effect of material deprivation on pupil achievement and adjustment was twice that of parental involvement, 'significantly undermining the positive effects of parental involvement on children'.

The strength of the relationship between parental involvement and children's skills acquisition. As Henderson and Mapp (2002, p. 30) state, 'the more families support their children's learning and educational progress, the more their children tend to do well in school and continue their education'. Similarly, a study conducted by Cotton and Wikelund (1989) found that the more active forms of parent involvement produce greater achievement benefits than the more passive ones. That is, if parents receive phone calls, read and sign written communications from school, and perhaps attend and listen during parent-teacher conferences, greater achievement benefits accrue than would be the case with no parent involvement at all. However, considerably greater achievement benefits are noted when parent involvement is active—when parents work with their children at home, certainly, but also when they attend and actively support school activities and when they help out in classrooms or on field trips, and so on.

This study is generally intended to explore the current Eritrean parents' involvement in and support of their children's skills acquisition. To this end, the status of the parents' involvement and the type of supportive actions that they exercise have been comprehensively analysed. In detail, the research has the following specific objectives to attain: 1) To determine the relationship between parents' involvement and children's acquisition in skills; 2) To examine the relationship between parents' educational level and children's skills; 3) To explain the relationship between frequency of parents' school visits and children's skills; 4) To determine whether the accessibility of learning facilities support children in their skills development; and 5) To know the supportive procedures parents usually practice in guiding their children in acquiring skills.

The main research question was as follows:

What is the strength of the general relationship between measured parental involvement and students' skills in Eritrea?

And as sub-questions:

1. What supportive actions do parents use in helping their children acquire skills?
2. To what extent does the educational level of the parents influence children's skills?
3. How does the frequency of parents' school visits influence children's skills?
4. To what extent does the provision of books at home support children's skills?

Methods

This research utilised a descriptive research design, which specifically applied the survey method. It was conducted in four elementary schools in Asmara (the capital city of Eritrea), namely Mai Tesfa Elementary School, Model Elementary School, Dahlak Elementary School and Lalimba Elementary School. To gather data from the targeted population, this research used an adopted questionnaire for parents, which was administered by the data collectors. In addition, this research conducted tests that assess the skills/knowledge of grade 1 students in the schools. In this study, 241 children in grade 1 were randomly selected from four randomly selected schools in Asmara to sit for the tests. Moreover, to administer the parent questionnaire, all of the children's parents were requested to come to their children's respective schools.

Table 1 shows that the grade 1 students drawn as a sample were 50.8% male and 49.2% female. The table also shows that the participants were selected from four elementary schools in Asmara. Among these, 19.9% were from Dahlak, 44.4% were from Lalimba, 12.4% were from Mai Tesfa, and 23.2% were from Model.

Table 1. Descriptive statistics of participant grade 1 students

	n	%
Gender		
Male	120	50.8
Female	116	49.2
Total	236	100
School		
Dahlak	48	19.9
Lalimba	107	44.4
Mai Tesfa	30	12.5
Model	56	23.2
Total	241	100

The parents who participated in the study were predominantly the students' biological fathers (n=83, 49.1%) and mothers (n=80, 47.3%). The remaining 3.6% (n=6) were not the students' biological parents. most of the participants (n=107, 63.3%) had completed junior or secondary schooling. Of them, 26.6% (n=45) were in their tertiary level and 7.7% (n=13) had completed the elementary level. Very few of them were illiterate and attending adult education (n=4, 2.4%).

To analyse the data collected from the parent questionnaires, both qualitative and quantitative approaches were applied. In utilising the qualitative data analysis, the research team used an inductive approach, whereby the data was analysed with the help of concrete themes that merged the participants' responses into certain major categories. For the quantitative data, both descriptive and inferential statistics were applied. The results were depicted in the form of tabulations and percentiles. Eventually, the results obtained from the parent questionnaires were cross-tabulated to find the regression results of the identified variables in the study with test results. Generally, this research utilised the SPSS software to analyse the data collected from all participants.

Results

Supportive actions

As depicted in table 2, the majority of the participants (91.1%) reported that they help their children with reading and writing homework. However, 8.9% of the participants said that they do not get involved with helping their children with their reading and writing homework. Similarly, 90.5% of them said that they help their children with their math homework, and the remaining 9.5% do not involve themselves with helping their children with their math homework.

Table 2. Descriptive statistics of the extent to which parents or guardians help their children in performing reading and writing homework (N=169)

		n	%
Do you help your child with reading or writing homework?			
	Yes	154	91.1
	No	15	8,9
Do you help your child with math homework?			
	Yes	153	90.5
	No	16	9.5

Table 3 shows a list of practices that parents use to support their children in accomplishing their reading and writing homework. Among these, most

of them help their children by providing other similar questions as those found in their homework (59.7%) and by encouraging their children to do their homework on their own (51.3%). The rest of the participants revealed that they practice various procedures as indicated in the table below.

Table 3. Percentages of parent/guardian responses regarding the extent to which they help their children with reading and writing homework (N=154)

	n	%
Read to him/her	4	2.6
Encourage him/her to read/workout questions	79	51.3
Give other similar questions to those in the homework	92	59.7
Morally support him/her in homework or study	22	14.3
Provide him/her with supplementary reading materials	13	8.4
Assign him/her reading time	2	1.3
Other	5	3.2

As represented in table 4, 72.5% of the participant parents reported using illustrations or examples with their children when doing their math homework. Of them, 32% said that they let their children do their homework by themselves and then the parents check their work. Also, 24.2% of the parents reported using certain teaching aids to help their children with doing their math homework. The rest of the participants reported using various supportive acts.

Table 4. Percentages of parent/guardian responses regarding the extent to which they help their children with math homework (N=153)

	n	%
Help him/her (general)	27	17.6
Give illustration/example	111	72.5
Child does homework and I check it	49	32.0
Use teaching aids	37	24.2
Do his/her homework (parent)	3	2.0
Encourage him/her to do even the difficult questions	4	2.6
Hire tutor	2	1.3
Other	3	2.0

The accessibility of children to reading materials at home. As represented in table 5, the majority of the participant parents (79%) reported that they have books at home for their children. The remaining 21% indicated that their children have no access to reading books at home. Furthermore, 46.2% of the participants reported that they have a few books and 40.2% said that they have an average number of books at home for their children. A few of them (11.4%) said that they have many books, and the remaining 2.3% said they have a lot of books available for their children to read.

Table 5. Descriptive statistics of the accessibility of children to reading materials at home

		n	%
Are there books for your children at home?			
	Yes	133	78.7
	No	36	21.3
	Total	169	100
How many books for children do you have?			
	A few	61	46.2
	Average	53	40.2
	Many	15	11.4
	A lot	3	2.2
	Total	132	100

Table 6 shows that 10.1% of the participants reported that they visit their children's schools many times during the year. Similarly, 8.9% of the participants also visit schools more than eight times a year, and 11.8% of them do not visit the schools at all. The majority of the parents, i.e. 26% and 36.1%, visit their children's schools 4–8 times and 1–3 times a year, respectively. The rest (7.1%) did not give a relevant response to this item.

Table 6. Descriptive statistics of how often parents/guardians visit schools (N=169)

	n	%
How often do you meet with teachers to discuss your child's education?		
Many times a year	17	10.1
More than 8 times a year	15	8.9
4–8 times a year	44	26.0
1–3 times a year	61	36.1
Do not visit	20	11.8
Cannot say	12	7.1

Table 7 shows that the majority of parents (76.7%) contact their child's teacher to discuss his or her poor academic performance. Of them, 27.4% said that they visit the school and contact teachers when the school invites parents, and 21.2% said that they contact the teacher to discuss their child's disciplinary problems. The remaining few participants reported that they contact their child's teacher for various reasons.

Table 7. Percentage of parent/guardian responses to the objectives of the last parent and teacher meeting (N=146)

	n	%
When school invites parents	40	27.4
Poor performance of student	112	76.7
Disciplinary problem of student	31	21.2
To ask permission for student from school	2	1.4
To speak on behalf of a child, e.g. bullying	7	4.8
Related to health and psychological problem of child	6	4.1
Active in school affairs	5	3.4

Predictors of literacy learning outcomes

As indicated in table 8, the explanatory variables of regression analysis are gender (female = 0, male = 1), school (reference is Dahlak), educational level of parents (reference is elementary school), books for children at home (No=0, Yes = 1), and frequency of school visits (one to three times a year is the reference category).

All the signs of the coefficients were as expected. The interpretation of those coefficients which were found to be statistically significant is given below.

Educational level of parents. A student whose parent has a tertiary education (diploma or above) is, on average, expected to score 17.6 points higher compared to a student whose parent/guardian has an elementary education. The difference is significant at the 5% level of significance.

Table 8. Regression table for the identified variables of the study and literacy results

	Unstandardised coefficients		Standardised coefficients		
	B	Std error	β	t	p
(Constant)	51.63	13.87		3.72	<.001
Gender	-4.74	4.13	-.09	-1.15	.254
School					
Lalimba	-3.71	5.63	-.07	-0.66	.511
Mai Tesfa	-20.41	6.80	-.29	-3.00	.003
Model	-2.62	6.25	-.04	-0.42	.676
Educational level of parents					
No education	18.55	15.10	.12	1.23	.221
Junior, secondary	11.50	7.91	.22	1.45	.148
Tertiary	17.60	8.57	.31	2.05	.042

(continued)

Table 8. (continued)

	Unstandardised coefficients		Standardised coefficients		
	B	Std error	β	t	p
Availability of books for children at home	3.39	5.30	.06	0.64	.524
Frequency of school visits by parent/guardian a year					
More than 8 times a year	2.97	5.98	.05	0.50	.620
Between 4–8 times a year	5.73	5.36	.10	1.07	.286
Do not visit	-3.43	5.84	-.06	-0.59	.558

Note. Gender: 0=female, 1=male. Dahlak as reference school. Education: elementary education level as reference. Books: 0=no, 1=yes. Visits: 1–3 times a year as reference.

Predictors of numeracy learning outcomes

Most of the signs of the coefficients were as expected (table 9). Below, an interpretation of those coefficients which were found to be statistically significant is given.

Educational Level of Parents. A student whose parent has a tertiary education (diploma or above) is, on average, expected to score 13.8 points higher compared to a student whose parent has an elementary education, for a comparable status in the other controlled variables. The difference is significant at the 5% level of significance.

A student whose parent has a junior, secondary education is, on average, expected to score 11.1 points higher compared to a student whose parent/guardian has an elementary education, for a comparable status in the other controlled variables. The difference is significant at the 5% level of significance.

A student whose parent has no or adult education is, on average, expected to score 20.6 points higher compared to a student whose parent/guardian has an elementary education, for a comparable status in the other controlled variables. The difference is significant at the 5% level of significance.

Frequency of Parental School Visits. A child whose parents do not visit the school during the year is, on average, expected to score 8.1 points lower compared to a child whose parents visited the school one to three times in a year, for a comparable status of the other variables in the model, and this difference is statistically significant at the 5% level of significance.

Table 9. Regression table for the identified variables of the study and numeracy results

	Unstandardised coefficients		Standardised coefficients		
	B	Std error	β	t	p
(Constant)	48.62	8.79		5.53	<.001
Gender	-3.06	2.69	-.09	1.14	.257
School					
Lalimba	5.26	3.72	.15	1.41	.160
Mai Tesfa	-7.63	4.51	-.16	1.69	.093
Model	-6.02	4.15	-.15	1.45	.149
Educational level of parents					
No education	20.56	10.17	.19	2.02	.045
Junior, secondary	11.11	5.42	.31	2.05	.042
Tertiary	13.81	5.85	.36	2.36	.020
Availability of books for children at home	3.58	3.52	.08	1.02	.311
Frequency of school visits by parent/guardian a year					
More than 8 times a year	-0.20	3.79	-.01	-0.05	.958
Between 4–8 times a year	-0.46	3.48	-.01	-0.13	.896
Do not visit	-8.11	3.87	-.18	2.10	.038

Note. Gender: 0=female, 1=male. Dahlak as reference school. ducation: elementary education level as reference. Books: 0=no, 1=yes. Visits: 1–3 times a year as reference frequency.

Discussion

Families, schools and communities as a whole contribute in unique and complementary ways to a child's learning process. Children's learning outcomes are the result of multiple actors, such as parents, teachers, schools, the wider community, and peers, which interact in a child's learning and formal education. Successful parental engagement strategies and initiatives reflect an awareness of this interdependence and the wider context in which child development occurs (Emerson et al., 2012). Likewise, the present research identified that parents are involved in their children's learning through various supportive procedures. The majority of the parents of the sample children reported that they support their children in literacy and numeracy acquisition. They explained that they support them by providing other similar questions to those in their homework and by encouraging their children to do their homework themselves in their literacy work. In addition, they indicated that they use various supportive procedures that differ from one another. With regard to their math homework, the majority

of the parents help their children by giving them illustrations or examples. Some parents described that they let their children do their homework by themselves and then the parents check their work. Others also practice using certain teaching aids to help their children with their math homework. The rest of the participants reported using supportive acts that differ from one another. The study also shows that the majority of the parents visit schools one to eight times a year to discuss their children's academic performance with their teachers.

Parent-school relationships do not occur in isolation, but in community and cultural contexts. One of the biggest challenges schools have today is the increasing diversity among students (Lichter, 1996). Demographic characteristics, such as socioeconomic status, ethnicity and cultural background, and other parental characteristics are systematically associated with parental school involvement (Hill &Taylor, 2004). Correspondingly, this research found that variables such as parents' educational level, accessibility to books at home and frequency of parental school visits, have a definite relationship as normally expected. Among these variables, parents' educational level and accessibility to books at home show a positive relationship with literacy results. Whereas with regard to parental school visits, the research shows that parents with no visits have children with very low literacy results. However, parents' educational level was only found to have a statistically significant relationship with children's literacy results. In numeracy, parents' educational level and parents with no school visits were found to have statistically significant positive relationships with the children's numeracy results. With regard to the availability of books for children at home, parents with a certain number of school visits were found to have a positive relationship with their children's numeracy results, but this was not statistically significant.

Generally, the study shows that parental involvement plays a crucial role in guiding learners to master skills at their level. The parents support their children in performing math, reading and writing homework using various supportive procedures at home. The majority of the parents visit schools one to eight times a year to discuss their children's academic performance with their teachers. They provide learning materials at home which can support their children in their learning. Furthermore, the parents' demographic characteristics were found to have a positive relationship with the test achievement of the learners. However, some of the relationships are not statistically significant. In supporting their children, parents explained that they use various procedures that differ depending on various characteristics, such as the parent's educational level, which is known to determine the level and quality of support.

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Parent–teacher partnership in support of student learning in Eritrean elementary schools

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Abstract

The learning of school children involves a concerted effort of different stakeholders putting teachers and parents at the forefront. Teachers are at the heart of framing and mediating activities, building relationships between students and subjects. In the Eritrean school system, parents are acknowledged as the primary stakeholders in the education of their children in different ways. The focal point for all of these efforts, however, is the child – the key stakeholder in education. This paper explores the parents' and teachers' perceptions, and the parent–teacher partnership in children's learning in the Eritrean elementary schools (grades 1 and 5). In Eritrea, primary education is the formative level and foundation in the hierarchy of the educational system. Harmonious parent–teacher support for the child's learning at this stage has a positive multiplier effect for the following levels. The research involved 363 parents and 36 elementary school teachers. Semi-structured parent questionnaire and teacher questionnaire instruments were used to gather qualitative data. Descriptive analysis techniques were employed. Children supported at home are appreciated by teachers for their academic performance, their diligence in learning, hygiene, discipline and other social values. Parents appreciate the significance of home–school communication. The learner is the channel of communication between parents and teachers. Parents and teachers call for well-coordinated communication between home and school to make learners good students and citizens.

Keywords: home literacy environment, learning, home-based support, parent–teacher partnership

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Introduction

Education is transformative and a catalyst of positive change in the thinking, behaviour and understanding of pupils as well as laying the foundation for a better future. Education involves a concerted effort of different stakeholders, including providers of learning resources, policies and curricula, parents (Ps) and teachers (Ts). Teachers are at the heart of framing and mediating classroom tasks, building relationships between students and subjects as well as acting as the link between the school and parents. Parents practically support education in different ways by ensuring their children go to school, get interested in learning, do their homework, etc. The focal point for all of these efforts, however, is the child – the key stakeholder in education. The attention, efforts and interactions between parents and teachers are focussed on the child. When parents and teachers understand how the child can learn best when they collaborate on the student's learning, a purposeful partnership between all concerned stakeholders and the home–school in particular boosts the student's learning outcomes.

This chapter explores the parent–teacher partnership in children's learning in Eritrean elementary schools. It further examines how the home literacy environment and home–school communication affect students' learning outcomes. In Eritrea, elementary school education is the formative level and foundation in the hierarchy of the educational system. Harmonious parent–teacher support for the child's learning at this stage has a positive multiplier effect on various levels. Before introducing the study in more detail, however, we provide a brief overview of the role and responsibilities of parents and teachers in students' learning in the Eritrean elementary school context.

The parental role in supporting a child's learning and igniting the child's motivation to learn is very supportive for the student and accelerates the teacher's work at school. The Eritrean education system treats parents as the major components of its stakeholders' network, especially in the parent–teacher-student association (PTSA). The guidelines for the PTSA set by the Supervision Division of the Ministry of Education (MOE) in 2008 stipulated that the participation and support of parents and communities in school activities expedites the efficiency of learners and the achievement of the mission of the schools. The guidelines further noted that parents must play a leading role in the all-round strengthening of schools. A nationwide study conducted in Eritrea reported that 'if there are lapses in student motivation and interest, it is the responsibility of parents, teachers, education authorities and other stakeholders to provide an enabling environment in which students can experience success in school and in work contexts' (MOE, 2016, p. 82). The lack of motivation of learners has become a worldwide challenge of education systems (South African Review of Education [SARE], 2008). The MOE (2016) highlighted the strategic importance of the

parental involvement and Eritrea has 'developed policies and strategies to support the growth and expansion' of early education with 'partnership[s] involving families, communities and government institutions' (p. 22).

In the Eritrean elementary school context, teachers are usually recruited by MOE with the requirement of a teaching certificate from Asmara Community College of Education (ACCE). ACCE shoulders the responsibility of the one-year certificate programme of the basic level of teacher preparation after the candidates sit for a matriculation examination in grade 12. The Ministry also recruits 'non-trained teachers' without prior teaching experience, but later trains them through summer in-service training programmes. The ACCE recently started receiving training candidates directly from high school (grade 10) based on their interest to pursue a career in teaching. The current policy of the MOE aims to keep only trained teachers in the classrooms. This strategy entrusts qualified teachers to take responsibility for teaching the respective subjects and get involved in the overall school activities.

Teachers guide and facilitate children's learning in and out of the classroom. The Eritrean school system follows the learner-centred interactive pedagogy (LCIP) approach. However, this does not seem practical in many cases for a number of reasons, including unideal class sizes for LCIP, the classroom arrangements, such as 'chain-connected' desks one after the other, teachers not trained in the LCIP strategy, etc. In such a situation, the communication between parents and teachers (home–school partnership) becomes a great source of collaboration for better learning. Teachers, parents and students are the foundations of the school community entrepreneurship.

Though teachers are often expected to socialise parents into the school and teaching-learning activities (Sriprakash, 2010), how teachers should socialise parents to the roles they need to play and how the support provided by teachers and parents intersect at the point of the child are less clear. The aim of the study is to empirically investigate the school–home partnership by exploring the support of teachers and parents in educating school children at elementary schools. The overall research task is to better understand the way in which the support provided from these two different banks of the river can intersect. The specific questions addressed in this chapter are:

1. What are parents' perspectives on the parental support pupils need?
2. What are teachers' perceptions of the support provided by parents?
3. What are the current arrangements for parent–teacher communication?

Methodology

As outlined in the Introduction, questionnaires were employed to gather

parents' and teachers' perspectives on learning and home-based support for children's learning. The research focused on the converging efforts of the parent–teacher partnership in relation to the perceived performances of learners. The parents' data was based on a parent questionnaire developed as part of a larger research initiative within the Eritrea Learning For All (ELFA) project. The authors were involved as researchers in developing and administering the questionnaire. The participants were parents of grade 1 and grade 5 students and their teachers. All the parents and teacher participants came from four elementary schools in Asmara, namely Dahlak, Lalilmba, Mai-Tesfa and Model. All in all, 490 parents were called during the weekends for interviews in four schools. A total of 363 parents participated, which is approximately 75%. The teachers' questionnaire was developed by the research team as part of the ELFA project, and the research team distributed 40 teacher questionnaires with 15 open-ended questions in the four elementary schools selected for the ELFA research project. Thirty-six teacher questionnaires were returned, which is a return rate of 90%. The interviews and distribution of questionnaires were conducted at the selected schools by the staff from the COE, the MOE and ACCE. This study contains both qualitative and quantitative information. As the ELFA project parental questionnaire included questions that go beyond the provision of support and perceptions of learning, only the data relevant to the topic were selected. The qualitative data were analysed following a qualitative content analysis approach (Krippendorf, 2002). Descriptive statistics are used to illustrate parental involvements.

Results

This section introduces quantitative results with regard to parents' perceptions of education and practices in support of their children, teachers' perceptions on home-based support of learning, communication and the parent–teacher partnership in learning. Figure 1 portrays the literacy of the home environment of the parents/guardians in terms of the provision of printed materials, parents' modelling children in reading and reading for the child at home. Children from households with more books and which support the children in reading were expected to positively impact the students' learning processes and outcomes.

The summary of responses from parents about the support provided to their children in English and mathematics is shown in Figure 2 and 3. The adjacent charts display the main activities and how the parents act in support of their children's learning. The results indicate that 58.3% of the respondents said that they encourage their children to read at home, while 69.4% of them responded that they help their children by giving exercises similar to the homework in numeracy.

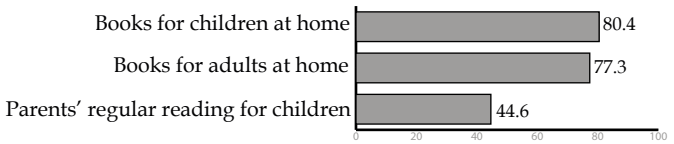

Figure 1. Books at home and parents' reading to their children

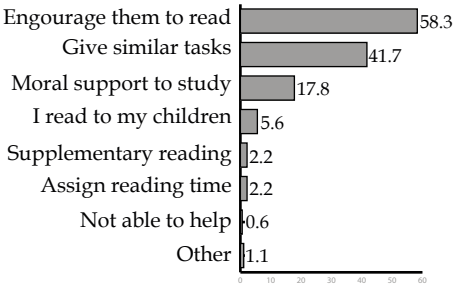

Figure 2. Home-based learning support for students in English.

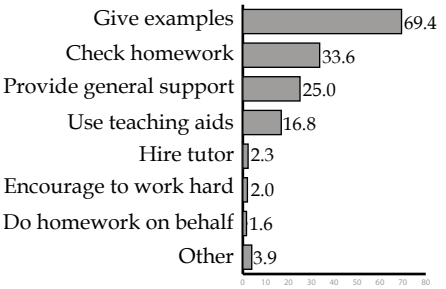

Figure 3. Home-based learning support for students in mathematics

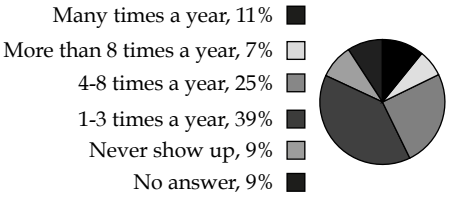

Figure 4. Frequency of parents' school visits.

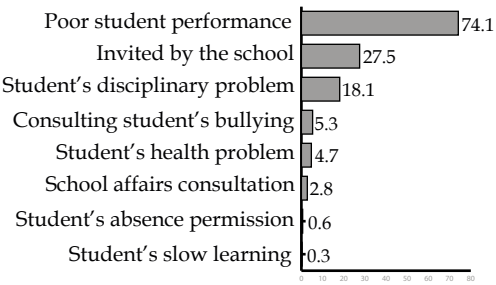

Figure 5. Aims of parents' school visits.

Figures 4 and 5 summarise the frequency of parents'/guardians' school visits to discuss their children's school performance with their respective teachers. The majority of them visited the school between one and three times during the academic year. In addition, the objectives of the parents'/guardians' last visit indicate that 74.1% of the visits were aimed at discussing students' poor academic performance with the teachers.

Parents' Perspective of Student Learning Outcomes and Practices to Support Learning

The results in response to the first research question suggest that with regard to the four schools, overall the parents' perspective indicates a reasonably high degree of parental interest in the education of their children. Parents seek to provide support from home, encourage children to complete assigned tasks, and are ready and responsible regarding their school studies. The results indicate that parents are keen observers of behavioural and social changes as well as skills development the students demonstrate as the result of schooling. The skills included in the parents' responses were cognitive, social, language and self-concept skills. The parents remarked that they are happy with the cognitive improvements in literacy and numeracy their children attained since they started schooling. With regard to social skills, the parents recognised that their children are learning not only to read and write but also how to communicate and interact in pairs and with a large audience outside the home environment.

One father whose child joined elementary school through kindergarten noted that 'since he enrolled at kindergarten, my child learned to sing, to orally recite poems, and actively participate in extra-curricular activities beyond my expectations' (Parent-1). Parents appreciated the fact that their children learn a number of social skills in school, such as respecting and helping others. Another father interviewee said that 'the school is teaching them a lot of new things that can help them outside home' (Parent-2).

With regard to language skills, mastering language and improved communication skills of students are admired by the parents. From the parents' point of view, a student who started speaking English in the early grades is regarded as if he or she is learning better, although this is not always the case (Marinova-Todd, Marshall, & Snow, 2000). The results suggest that parents are very interested in the overall development of their children and value the role of school within this process. One mother shared that "… above all, my child learned to understand a number of concepts, such as the school time concepts, and developed an interest in going to school by himself" (Parent-3). One father explained:

> *I observed a great deal of behavioural changes in my son. In the beginning, I was frequently being called to school because he was responding to his classmates physically than verbally. But through time, he learned how to interact with others in the classroom and outside school in arguments, rather than biting. This is big progress in shaping his personality.* (Parent-4)

Home literacy environment and students' learning. To understand the home literacy environment and the support provided by parents at home in support of the child's learning and schoolwork was explored in terms of the type and availability of printed books for children and adults at home

as well as the reading habits of the parents/guardians. The types of reading material available at home are likely to influence the reading appetite and motivation of the learner. A large number of the households indicated the availability of relevant books for the children and parents at home. Parents use textbooks, reference books and newspapers to support their children's learning. However, the print environment alone is not enough; the reading habit at home is equally important. The parents' reading habits for themselves and for their children are not encouraging (Figure 1). A large number of parents reported that they have books at home for adults and children, but they did not hide the fact that their reading habits are not a good model for their children.

Parents reading at home to their children or for themselves serve as good models for reading. Children can learn better to read at home by observing their parents than by being told to read by parents who never read themselves. An interviewee parent said, 'I do not read books deliberately to influence the child' (Parent-5). During the interview, parents indicated that their children mainly observe them reading local daily newspapers and periodicals. However, the majority of parents in our sampled schools were functionally literate enough to support the learning of the elementary school children at home through reading.

Strategies of home-based support for students' learning. Parents/guardians are regarded as the major stakeholders for learners' home-based support. The quality of knowledge-based parental support and the strategy employed make a difference in students' learning. Parents use different helping strategies, from scaffolding and ordering to study and control strategies, to academically assist their children's learning at home. The parents indicated that they provide reading materials in English and get involved usually when the child is experiencing translation or spelling difficulties. The majority of parents reported that unless the student approaches them and asks for help, they only involve themselves in 'correcting errors' that the student makes in school. According to the parents, in learning mathematics, practice is crucial. Parents assist children by giving mock exercises similar to the classroom and homework activities.

Another strategy, which is not common to many households for financial reasons, is home-based regular tutoring. Home-based tutoring is done either by hiring a private teacher to teach the child at home or sending the child to the teacher(s) running tutorial in line with the regular classes in school or summer classes for groups of students in private houses and schools, too. Some parents indicated that they set timetables for their children to study at home and elder siblings take on the teaching job. Home-based teaching, however, can facilitate or hinder learning, depending on the approach used and the family context. Sometimes it puts extra demands on students, which might reduce the child's interest in education if he or she is too busy at home. As a result, home-based support can be a source of confusion for

learners. One father participant noted:

> *We teach her [his daughter] every lesson before the teachers teach her in school. But at times, there is confusion because the method her teachers use and what we use to teach her at home have some differences. ... we tell her that she must know both ways but during examinations, she has to follow what her teachers taught her at school.* (Parent-8)

The parental assistance focuses on task-oriented support, usually immediate assistance while doing homework and assignments and guiding the students to read themselves. An interviewee parent said that in learning literacy, 'First, I tell my kid to read by herself, help her based on the textbooks and from experience' (Parent-6). Another parent said that 'I focus on encouraging my child to develop the concept of self-learning and time management' (Parent-7).

Teacher Perceptions of Home-Based Support to Students' Learning

The results from the second research question suggest that teachers appreciate the home-based support. A teacher shared his opinion that '… active participation of parents in their children's learning process during the early school years is significantly important for later learning outcomes of their children' (Teacher-2). The quality of early learning has a determinant effect on learners' career orientations and purpose of life. These good intentions and mutual appreciation align with international research (Christenson, 2002) and the national education study (MOE, 2016).

Home-based support for children is regarded by teachers as highly supportive in the teaching-learning process. According to the teachers' responses, pupils regularly helped at home do better in their school academic performance. The teachers indicated that parents support their children to do their homework and better understand classroom lessons. As regards the teachers' explanations, when parents support students at home in line with the regular curriculum, learning becomes easy for learners at school and teachers encounter less difficulties in supporting the students. Children supported at home actively participate in learning duties, ask and answer questions in the class, explain and read well, complete their work in time, do their assignments and projects properly and express themselves in class with full confidence. One of the teachers commented '…from my experience, those who have parental support are well disciplined and the best achievers in the school' (Teacher-1).

In addition to the academic benefits, the teacher participants indicated that home-based support is visible in different dimensions of the students' learning, including neatness, hygiene, discipline, punctuality, interest and motivation towards learning. Students supported and not supported at home differ in their handling of learning materials and the way they

wear their uniforms. Students supported at home easily cope, understand the lessons and concepts without difficulties, actively participate in classroom discussions and perform well, and this significantly enhances their learning interest. One teacher said, 'Students supported at home are my stakeholders in teaching' (Teacher-3). In this regard, parental support was highly valued by the teachers and perceived as an important factor in the development of good learners and good citizens. One teacher participant indicated that weak students have minimal parental support. Another teacher explained that:

> *Children supported at home create less problems as compared with children not supported at home. Generally, unsupported children are not interested in learning, even fail to bring learning materials to school; their participation is low and are involuntarily involved in classroom discussions by being pushed by teachers. They do not complete their class and home work.* (Teacher-4)

A teacher participant observed that 'students with minimal parental academic support at home solely depend on the teachers activities' (Teacher-5). However, one teacher explained that though the best and average learners usually have parental support at home, on average, most of the parents are not academically supportive. He further elaborated that the interest of the parents to support is high, but they make excuses for their failure, such as being busy in their workplaces and an incompatible level of education.

Home–School Communication and Parent–Teacher Partnership on Learning

Research suggests that in the early school years, the support from parents and teachers provides a vital bridge into the school life of pupils (Ahtola et al., 2016). However, the results to the third research question highlight the difficulties of coordinating and developing this good intention. Although teachers and parents work for the same purpose to support the learning of learners in school, they often work from different banks of the river. The significance of harmonising the home and school initiatives to support student's early education is undeniably noteworthy. The teachers explained that, especially in grade 1, parental involvement and parent-teacher communication must be part of the daily exchange of information between the two parties. Vavrus, Thomas, and Bartlett (2011) described '… constructive relationships between teachers and parents' as decisive conditions for 'quality teaching' (p. 58). Sriprakash (2010) interviewed an experienced teacher (Savitha), who attributed his 'brilliance' to the '… interest of his parents demonstrated in his education' (p. 302).

The dynamics of the school–home partnership depends on parental visits to schools and respecting the school invitations. As is indicated in the pie chart above (Figure 4), only 7% of the parent participants reported that they visited a school eight or more times in the academic year. The quality,

frequency and style of home–school communication plays a crucial role in the learning progress of students. However, the absence of firm and proactive communication patterns between the two parties indicates the lack of a well-founded framework for a teacher–parent interaction strategy. The teachers indicated that the schools hold at least one general meeting with parents in a semester and another specific parents' day at school every semester as part of the school calendar. Teachers also privately ask parents to come to school to discuss the learning performance of their children. Special calls are usually made to parents of poor performing students or when they display some disciplinary problems and/or repetitive absenteeism. The main communication channel between home and school on students' learning are the learners. However, teachers complain that few parents respect the call, particularly parents of poor performing students, whose response is not up to the schools' expectations. Some of the parents of such targeted students come after several calls or never show up. However, it is hard to conclude that the parents do not want to show up. The students might not inform the parents about the requested meeting at school in time.

However, the parents of poorly performing children are only contacted with regard to negative messages; thus, perhaps a more constructive kind of relationship needs to be developed. Parents of good-performing students are often more interested in the learning progress of their children, because they regularly visit the schools to learn about the strengths, weaknesses and discipline of their children. A teacher noted, '… parents of good achievers are our regular customers. Their participation is very good to the extent of making the relationship between teachers and parents as family members' (Teacher-6).

The teachers and parents explained that the main purpose of parents' school visits is to see the students' marks. Teachers also know the involvement of the parents in the learning of their children by checking the parental signature on the students' exercise books on a daily basis, but this is not common to all teachers and parents. The parent–teacher discussions focusing on the students' performances are mostly held during the 15–20-minute break time or the teacher's free period during working hours. However, this well-intended communication between parents and teachers must involve providing more opportunities and engaging activities for parents to visit schools – not just during break times. The parents recommended a tight teacher–parent–student partnership that can embolden the home–school link to support student learning. Some parents reported that they discuss school administration, subject matter contents, methods of teaching, examination issues, etc., and provide financial assistance and make other contributions to the school. Thus, the intersection between parents and teachers as an investment in students' best learning experiences will remain of paramount importance not only in intention, but also in practice.

This study provides a glimpse into the teacher–parent partnership in select-

ed schools to support students' learning. However, the data does not represent the national situation, because the data was purposefully gathered from four elementary schools in Asmara. Nevertheless, this study provides insights into education in Eritrea, but it should be regarded as tentative results for further development.

Just as education continues to be an area for development in Eritrea as well as in other contexts, it is hoped that adopting a research-based approach to education will support this development. Research on education in Eritrea, however, is in its initial stages, but the results such as those presented in this publication should provide important insights and suggestions for ongoing action that supports the intersecting relationships between different educational stakeholders as well as wider educational development.

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ICT in teacher preparation

Information and communication technology in Asmara Community College of Education – Student teachers' perceptions

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Abstract

Information and communication technology (ICT) has become an important part of education. ICT is often perceived as a catalyst for change – change in learning approaches and in access to information. ICT offers us new ways to access information, analyse data and present findings. The present study aimed to show the role that ICT plays in learning and education in Asmara Community College of Education (ACCE). It also studied how ICT is applied at ACCE from the perspective of diploma student teachers. Furthermore, it studied whether gender differences existed regarding male and female student teachers' perceptions of ICT used in the classroom, and their accessibility to use it in learning and education. The participants were 92 student teachers from the diploma level, with 67 males and 24 females, while one student did not report a gender. The data were gathered via self-administrated questionnaires and were analysed by nonparametric statistical methods. The results indicated that students were highly confident in their ICT usage, and their estimates of ICT use in higher education were also very positive. Furthermore, there were some gender differences among the students' perspectives of ICT usage. Female students had higher confidence in their use of ICT than their male counterparts. The ICT usefulness estimations were not associated with the gender of student teachers.

Keywords: ICT, student teacher, Asmara Community College of Education (ACCE), Learning, education

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Introduction

ICT in Learning and Education

Information and communication technology (ICT) is starting to be seen in many aspects of life in the globalised world of the 21st century. ICT capacities are fundamental to participation and engagement in modern information society. ICT can be used to find, develop, analyse and present information, as well as to model situations and solve problems. Education is the first key area for ICT applications. A traditional approach to high achievement within a general education system assumes a high level of contact between teachers and students. The focus is on the teachers to present their lessons in a clear and concise way and, thus, on the efforts they exert in their classrooms. In education, ICT has the potential to offer great support to both teachers and students. It enables rapid access to ideas and experiences from a wide range of people, communities and cultures, and allows pupils to collaborate and exchange information on a wide scale (see Toro & Joshi, 2012).

ICT can help learning and education by providing supportive tools (Deaney, Ruthven, & Hennessy, 2003). In general, the purpose of ICT in education is to familiarise students with using and working with computers and ICT tools, and to understand the related social and ethical issues. Students can also use their smartphones to carry e-books and activities, and this can also facilitate their learning. ICT has also enabled learning through simulations and games. Moreover, ICT can be used as a tool for research, problem solving, creativity and learning (e.g. Akbulut, Kesim, & Odabasi, 2007; Kozma, 2008).

Instructors can enhance their teaching efficiency and create an engaging classroom where learning can be maximised by utilising ICT-interactive pedagogy. Online courses, online conferences and outreach programs are some examples of how ICT has been used in many universities and higher education institutions. Today, educational services have been taken to an international arena by crossing borders and by breaking the national boundaries. With the help of ICT, the newfound depth and breadth of educational services are being expanded to a wide variety of societies with diverse economic, social and political realities. With fast communication networks that offer increased access to online educational environments at home, work and school, learning could truly become a lifelong activity, one in which the pace of technological change forces the constant evaluation of even the learning process itself.

The use of ICT will not only enhance learning environments, but it will also prepare the next generation for their future lives and careers that will similarly involve ICT components (Wheeler, 2001). People benefit from having access to knowledge via ICT by keeping pace with the latest developments

(Plomp, Pelgrum, & Law, 2007). Furthermore, the round the clock usability of digital resources for students, teachers and professionals is supported by ICT with the creation of digital libraries (Bhattacharya & Sharma, 2007; Cholin, 2005). The truth is that communication and data processing technology products are already present in higher education. Consequently, efforts should be increased to understand how to use, supply and distribute ICT, what usage and ethical principles will be applied, and how their effects will be investigated and evaluated.

It has been shown in many countries that ICT usage among teachers is insufficient. However, since some students are loaded with information related with these products as a result of their environment, it requires opening a new dimension for relations among the student-teacher-manager and even parent (Sari, 2014). At the university level, the integration of ICT resources can facilitate learning, thus resulting in enhancing students' performance. According to Forcheri and Molfino (2000), ICT can be used to promote collaborative learning, including methods, such as role playing, group problem-solving activities and articulated projects. It is also believed that ICT could align theory and practice by creating interfaces whereby students could deal with questions and answers about the material, and by supplementing the lesson with visual displays, such as pictures and videos.

Important factors for the successful implementation of ICT in learning are ICT skills, confidence in using computers, infrastructure and availability of hardware and software. In contrast, barriers to the usage of ICT are, for example, a lack of technical support, insufficient knowledge, gender and age of the teacher, and lack of motivation. Toro and Joshi (2012) state that the teacher's enthusiastic nature towards using ICT, ICT policies, budget, educational management and skills training plays an important role in the integration process of ICT. The success of ICT-based education depends upon the teacher's ability to keep pace with the developments, since teachers are responsible for quality control, improvements in learning and the aggregate effectiveness of the learning process. The main role of teachers will not be to transmit information and culture, but rather to act as experts and leaders to motivate learning. However, the limitations of ICT's impact resides in the fact that the schooling content, methods and assessment criteria are rather inert to the continuous changes in reality (Toro & Joshi, 2012). Potentially, ICT can be a very powerful dimension to transform the way the young generation prepares for further education. It has great capabilities to spread knowledge, enhance education and develop a more efficient educational sector. It can be assumed that colleges with good ICT resources that are utilised well, have better learning environments for their students.

ICT in ACCE

According to the Ministry of Education (MOE, 2003) of Eritrea, the provision of education in Eritrea envisions the creation of a modern, technologically

advanced and internationally competitive economy. The Government of Eritrea has introduced ICT as an instructional, management and research tool in order to promote creativity, independent learning and innovative thinking in the student population (MOE, 2003). Many of the current policies and practices reflect a technocratic determinism in which technology is considered unproblematic as it provides relatively immediate tools for teachers and students, and its use primarily calls for the development of technical skills. ICT in education is a key contributor to improving the quality of education in Eritrea and enhancing life-long learning skills, such as information processing, critical thinking and problem solving. The MOE in Eritrea is pushing for an educational reform where ICT will become a part of the learning process for every student. Even though there are some optimistic hopes in Eritrea, some inherent problems with the internet still persist. According to Nirmala, Karthikeyan, Appalabatla, and Patharaj (2012), the level of internet connectivity in Eritrea is very low. Furthermore, ACCE has no access to the internet, even though ICT is a compulsory subject for all students. ACCE has three ICT rooms, each of which has 25 computers. The college does have plans to equip the ICT rooms with the needed ICT tools in the future, including internet connectivity.

ACCE has more than 200 diploma students (during academic year 2016–2017) who come from six administrative zones in Eritrea. The students have varying degrees of understanding of ICT and computers. This study explores students' current perceptions and experiences in the use of technology in education and, therefore, aims to provide supporting material for the MOE in the execution of their educational reforms.

The specific research questions are as follows:

1. How confident are student teachers at ACCE in their use of ICT?
2. How useful is ICT for learning, according to the student teachers at ACCE?

Age, gender and ownership of ICT equipment were used as independent variables.

Methods

Students were randomly selected from the ACCE students, and their participation was voluntary. The questionnaire consisted of both structured and unstructured questions. The questionnaire was distributed in a print format. In this study, a total 92 student teachers from the diploma level participated. Of the participants, 67 were male and 24 were female, while one participant did not report a gender. The average age of the participants was 30.13 (SD=6.45). Female student teachers (M=25.00, SD=4.40) were statisti-

cally significantly younger than the males (M=31.66, SD=6.19); t(85)=-4.48, p<.001.

The questionnaire consisted of three parts. The first part had an open-ended question that was meant to analyse the students' possession of electronic devices, such as computers and mobile phones. Here, the idea was to collect data about students' access to devices that could support learning. The second part included questions regarding students' confidence in using technology for various learning processes, personal development and management purposes. Items related to the frequency of technology use had a 5-point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = no opinion (missing value), 4 = agree and 5 = strongly agree. Those participants who responded with '3' were omitted from the analysis. The third part inspected the students' confidence in using various technological tools and methods, such as typing, software installation, customising the desktop and software use, including MS Office, Adobe Reader, EPUB and Geez Word. The third part used a 4-step scale: 1 = I don't know the application, 2 = not confident, 3 = confident, and 4 = very confident.

The statistical analysis were made using the SPSS program. The descriptive results are presented as frequencies and percent proportions. Sum scores are reported as their means and standard deviations. The items were recoded so that the higher number refers to higher confidence. The level of confidence of the use of ICT was the average score of three items ('I am confident using ICT', 'I feel fearful using ICT' and 'I have seen ICT gadgets for the first time at ACCE'). The Cronbach's alpha was .73. The usefulness of ICT in education was the average of two items ('ICT should be used in teaching' and 'ICT should be used in learning'). The Cronbach's alpha was .80. The significance of independent variables for bivariate dependent variables was analysed by logistic regression analysis. There was non-normality in the distributions of continuous dependent variables; therefore, age associations were analysed by Spearman's rank order correlations. Gender differences and ICT-equipment ownership results were analysed by Mann-Whitney U-test.

Results

ICT equipment

Most of the student teachers' had at least one piece of ICT equipment (59.8%). The age of the student teachers was not a statistically significant predictor of ownership (B=-.02, SE=0.03, Wald=0.46, df=1, p=.496). The distribution was not associated with the gender of student teachers; χ^2=0.54, df=1, p=.464.

ICT confidence

The confidence level of the use of ICT among the student teachers was relatively high (M=2.83, SD=0.75). The student teachers' ages correlated statistically significantly with their ICT confidence level (r_S=-.34, p=.001). The older the students were, the less confident they were. There was a statistically significant difference between the female and male student teachers' views; U=400.00, Z=-3.67, p<.001. The female (mean rank=62.83) student teachers' confidence level was higher than the male (mean rank=39.97) student teachers'.

Student teachers who had ICT equipment (mean rank=54.55) estimated their confidence in the use of ICT more positively than students who did not own the equipment (mean rank=34.55); U=575, Z=-3.55, p<.001.

Most of the student teachers were relatively confident with their basic ICT skills (see table 1). They were confident in the use of computer and MS Office tools. However, they were less often confident in the software installation and in the use of applications. About 56% did not know Adobe (Acrobat) Reader.

Statistical testings revealed that the male student teachers were more confident in the software installation estimations than the females. By contrast, the female students teachers reported a higher level of confidence than the males in respect of desktop customication, use of Word, Excel, EPUB (i.e., e-book format), and Geez Word (i.e., language learning application). Finally, those student teachers, who owned at least one ICT equipment, reported higher confidence in the use of keyboard, mouse, PowerPoint, and Geez Word than those without their own equipments.

ICT usefulness

The student teachers regarded the use of ICT in education very highly (M=3.39, SD=0.55). The students' ages did not correlate statistically significantly with their views on ICT usefulness; r_S=.03, p=.761. There was not a statistically significant difference between female and male student teachers' evaluations; U=716.00, Z=-0.74, p=.461). Also, the students' ICT equipment ownership was not associated with their views; U=716.50, Z=-.74, p=.461.

Table 1. Basic ICT Confidence Evaluations of Student Teachers.

	Don't know		Not confident		Confident		Very confident	
	n	%	n	%	n	%	n	%
Use of computer keyboard[c]	1	1.1	19	21.1	55	61.1	15	16.7
Use of computer mouse[c]	0	0	7	7.8	47	52.2	36	40.0
Software installation[a]	25	28.1	41	46.1	17	19.1	6	6.7
Customising desktop[b]	9	10.1	41	46.1	28	31.5	11	12.4
MS Word[bc]	3	3.4	20	22.5	46	51.7	20	22.5
MS Excel[b]	2	2.2	22	24.4	50	55.6	16	17.8
MS PowerPoint[c]	19	21.3	37	41.6	25	28.1	8	9.0
Adobe Reader	50	56.2	21	23.6	14	15.7	4	4.5
EPUB[b]	63	70.8	18	20.2	7	7.9	1	1.1
Geez Word[bc]	26	28.9	20	22.2	29	32.2	15	16.7

Note. [a] = statistically significant association, males > females. [b] = statistically significant association, females > males. [c] = statistically significant association, no ICT equipment < at least one piece of ICT equipment.

Discussion

How confident are student teachers in the use of ICT at ACCE?

Confidence is related to the student's age at ACCE. According to our study, an older age means lower self-confidence. Many student teachers do not have ICT equipment. There is also a big gap between ICT usages. Students start their ICT usage at very different levels. How can their studies be supported at ACCE? What kind of pedagogical support must be given to those students who are not confident and familiar with ICT? ICT skills should somehow be evaluated at the beginning of their studies. Older students also need special support with ICT usage to raise their confidence. These should be added to the curriculum, for example, additional courses in ICT studies. Eritrea is heavily influenced by prolonged colonialism, war and sanctions. According to Rodney (1981), means of communication were not constructed in the colonial period so that Africans could visit their friends. More importantly, they still were not laid down to facilitate internal trade in African commodities (Rodney, 1981). These problems had an immense effect on the usage and application of ICT. The current situation is still very complex, even though the government has put efforts into ICT (Nirmala et al., 2012).

How useful is ICT for learning, according to the student teachers at ACCE?

According to this study, ICT is considered very important for developing awareness, promoting life-long learning skills, such as information processing, critical thinking and problem solving, supporting pupils with special needs and girls, and improving management, operations staff and the community at large.

ICT is a tool to assist teaching, but it does not help academic outcomes. However, this does not mean that ICT will only help to achieve better outcomes if supported with awareness on how to use ICT as a means of development. In our case, this is due to the student teachers' background (place, infrastructure, society and the school community), age, interest and motivation, confidence, etc.

It can be seen that ACCE is still lacking in implementing ICT. Traditionally, teachers have been considered the key players in the arrangement of learning. It seems quite logical that teacher training should be the solid starting point for this innovative process. Thus far, the paradigm has been that teachers need to be taught as they are intended to teach. The dilemma of bringing teachers and student teachers to a new didactic method, such as the integration of ICT, resides in the fact that they themselves have been taught in plenary, discursive, non-ICT supported ways. Finally, there is an overall lack of candidate students in ACCE, and this deficit is compensated by an imported workforce from the other side of the digital divide. The processes of intensifying teacher attitudes toward using ICT in the learning process nowadays is helped by the development of alternative assessment methods, the admission of pre-service teachers, and the aim of distinguishing their predicted classroom performance.

There is no question as to whether or not ICT is applicable to learning; rather, the question is how to apply it effectively. According to the existing needs and capabilities, every nation must start training teachers on how to implement ICT in the learning process. Students also need to be provided at least with the basics on how to manipulate ICT for their learning purpose. Although in some places you see very small kids using recent technological innovations, such as the Xbox, tablets and so on, for personal enjoyment, we also need to make them use those for educational purposes.

The main role of ICT is to act as a catalyst for the learner's interest to get acquainted with the 'unknown'. Even if the content is understood, it is not obvious what to learn and why it is important to learn. At the core of curiosity is one's existential awareness: what do I see as crucial for me and what (ICT) tools are critical in this process? It means that ICT is a bridge between existential and intellectual aspirations. As soon as learners perceive the need to learn to improve living conditions, it becomes difficult to

prevent them from learning. The scale of available knowledge impacts the way it functions in society. Here, the notion of 'memes' fits well; it claims that ideas compete, survive or become extinct due to their power of prediction. It does not matter how ideas are transported; what does matter is how to bring learners to the right communities so that they become critical thinkers, rather than absorbers of information.

Teachers have been polarised in their acceptance of the new technologies. Whilst some have enthusiastically integrated computers and the internet into the classroom, others have been cautious in their acceptance and some have simply rejected the technologies. There is a level of justifiable cynicism based on previous experiences with computer-based applications, such as computer-aided learning. Ironically, some enthusiasts have inadvertently damaged the reputation of ICT through poor classroom practices – using the technology for the sake of its novelty value. With the inevitable proliferation of ICT in the classroom, the role of the teacher must change, and here are four key reasons why this must happen:

1. It is no longer sufficient for teachers to merely impart content knowledge. It will be crucial for teachers to encourage critical thinking skills, promote information literacy, nurture collaborative working practices and prepare children for a new world. The internet is a network of networks providing opportunities for inquiry-based learning where teachers and students are able to access some of the world's largest information archives.

2. Teachers must begin to prepare the methods by which they meet children's learning needs and match curricula to the requirements of human thought.

3. ICT may also make some assessment methods redundant. In the ICT environment, online tests can easily be used, which will instantly provide the teacher with a wide range of information associated with the learner's score.

4. ICT will cause certain teaching resources to become obsolete.

This report has clearly demonstrated that any absence or shortage of ICT and insufficient ICT training for student teachers, as reported here, has the potential to alienate students' abilities, confidence and attitudes, and also to compromise learning. The factors that negatively influence student teachers' readiness for and confidence in using ICT need to be dealt with by the various stakeholders, including the college management and private partners, and especially the MOE.

However, the findings showed that technology use was very low in most cases, indicating that within the college, some student teachers perceived

their ICT integration confidence as high while most of the others perceived it as low. Since this college is the only one producing elementary teachers who are privileged to receive teacher training on ICT integration and access to technology tools, one would expect better results on ICT integration practices. While the overall use of ICT in the college was found to be low, the student teachers' perceptions revealed that very few students used ICT for learning, while the majority were found to have limited confidence in using technology to facilitate their learning. Therefore, it is suggested that ACCE explore ICT-integration strategies that focus more on making a shift from teaching ICT or using ICT for learning purpose to appropriate pedagogical uses that could enhance student teachers' learning. Teaching technology can have an impact on students' skills and knowledge of technology, while using technology to enhance learning can have an impact on the students' understanding of the lessons at ACCE.

These are quite tentative results. The questionnaire was not very thorough, although it provided some ideas from some areas. It was designed by other people (former members of ICT in an education module) and some of the questions do not represent the issue of the study area. Both qualitative and quantitative methods were used. We mostly used quantitative data due to a lack of clarity in the open-ended questions. We mainly measured attitudes and, thus, the results may be too positive. It is important to collect additional data; for example, observing with computers may give different results.

ACCE is already on good track with ICT. These results support ICT usage at ACCE in the curriculum. Finally, we recommend additional ICT training, which needs special attention to enhance the quality of education at ACCE and all sectors in the MOE.

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