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Editorial

By publishing its maiden issue of the Ethiopian Journal of Teacher Education and Leadership (EJTEL), the College of Education and Behavioural Studies (CEBS), Addis Ababa University (AAU), made a history. The Journal aspires to change the educational landscape of the nation by making a significant contribution to improvement of quality of teacher education and educational leadership. The aim of EJTEL is serving as a platform for professional dialogue and exchange of ideas on matters related to teacher education and leadership in Ethiopia and beyond. The Journal specifically strives to a) enhance research on teacher education and leadership by creating one more opportunity for publication of original research; b) serve as a venue for policy dialogue on teacher education and leadership through publication of critical reviews, communications and brief notes; c) improve the availability of local researches for the education sector so as to promote a culture of research informed praxis on issues pertaining to teacher education and leadership; and d) encourage graduate-level research be being a readily accessible outlet for graduate students whose programs require scholarly publication.

EJTEL welcomes manuscripts on various aspects of teacher education and leadership including teachers'/educational leaders' pre-service preparation, induction and in-service development; modalities of teachers/leaders' education; teacher professionalism; teacher/leaders demand and supply; teacher education policy; teacher education pedagogy; and teachers' career life-cycle across all levels of schooling. EJTEL also welcomes interdisciplinary and comparative explorations in the areas of adult education, curriculum studies, educational psychology, early childhood education, language education, science and mathematics education, social science education, and special needs education. The journal also publishes articles that focus on theories and practices in the leadership of educational institutions. These include KG to higher education leadership, monitoring and evaluation of educational programs, international comparative education leadership, educational finance, human resource development, educational planning and policymaking, and leadership ethics.

This issue has five research-based articles contributed by seasoned professionals in their areas of specialization. Tirussew Teferra's article entitled ***"Early Childhood Care and Education in Ethiopia"*** starts by underscoring that early childhood care and education is a critically important issue which decides the fate of any effort to promote a holistic development of citizens of any country. He then moves on by outlining the theoretical foundations and global trends of early childhood care and education; and highlights some of the most important indigenous childrearing practices, traditional early childhood education, and the development of modern early childhood education in Ethiopia. A brief but quite interesting discussion has been made by the writer regarding preparation of early childhood education teachers before he concludes his article with an equally brief reflection on the current state of early childhood care and education and its future prospects in Ethiopia. The second article entitled "***Teachers' Knowledge, Attitude and Practices on Visualization Techniques in the Teaching-Learning of Middle School Science and Mathematics Subjects in Ethiopia"*** has been contributed by Mulugeta Atnafu and his colleagues from CEBS. The writers gathered both qualitative and quantitative data from 151 middle school science and mathematics teachers selected from two regional states and one city administration of

Ethiopia. They found out that science and mathematics teachers' knowledge, attitude and practices in implementing visualization techniques were below average, with no significant difference attributable to differences in gender, qualifications, and subject

matter. This finding led to a recommendation that schools need to provide the appropriate tools for and training on how teachers implement visualization techniques. It was also recommended that textbooks and teachers' guides be revised by incorporating the appropriate visualization techniques.

The article, ***"Biology Teachers' Metacognitive Awareness of Teaching: The Case of Biology Teachers in Postgraduate Diploma in Teaching Program",*** has been contributed by Habtamu Wodaj. It examines metacognitive awareness of biology teachers by assessing the awareness of 90 biology teachers enrolled in postgraduate diploma in teaching program. The study revealed that biology teachers have a high level of metacognitive awareness of teaching, with no significant difference attributable to differences in teachers' gender, bachelor degree program and teaching experience. It was thus concluded that, though there was a variation in some components of metacognition, biology teachers attending postgraduate program had high metacognitive awareness. The fourth paper deals with ***"Emergency Education in Sweden"*** with a focus on ***"Education for Newly Arrived Students"***. The article, contributed by Kerstin von Brömssen and her colleagues, reports part of a research project that investigated the learning and social inclusion conditions of 'newly arrived students' in Swedish primary schools. It starts by providing an interesting account of the Swedish migration context, the 'migration crisis' in 2015 and the changes in the Swedish reception system that took place soon thereafter; and moves on to ethnographic observations from Primary Schools of two specific perspectives in education, namely a perspective on 'Framing of the day and the lesson' and 'Study tutoring in the mother tongue in regular teaching'. The study suggests that there is a strong need for supporting structures and structured social interaction as well as caring and empathy on the part of teachers to promote learning and social inclusion of newly arrived students.

The fifth article takes up an issue related to educational leadership. Denekew Zewdie investigated, in his study entitled ***"Staff Complaint Reasons and Handling Mechanisms: Sebeta Town Administration Education Office in focus, Oromia Regional State, Ethiopia"***, the nature of staff complaints and reasons thereof. Besides, the study examined ways of handling complaints. It was found out that complaints in the case studied emanated from four areas: the manner the organization is structured; the way of doing things (stringency and unfairness); individual differences and management related challenges. Despite the availability of formal committee at office level to deal with grievances, nearly all complaints failed to pass through this formal channel. The article ends by indicating the implications of the findings to educational policy and practice in Ethiopia.

Finally, the editorial team would like to take this opportunity to call upon all stakeholders (policy makers, staff of higher education institutions, graduate students, community-based organizations, civil society organizations, etc.) to use the Journal both as a source of information and platform to present their own views in one way or the other.

Aklilu Dalelo (Prof.)
Editor-in-Chief

Early Childhood Care and Education in Ethiopia

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Abstract

Early childhood care and education in Ethiopia is a critically important topic for consideration to promote the holistic development of citizens, quality education as well as the country's economic development. Indeed, these days it is encouraging to note that there have been promising initiatives in early childhood care and education to ensure access and equitable education in the years to come. This article first presents the theoretical foundations and global trends of early childhood care and education. It then highlights indigenous childrearing practices, traditional early childhood education, and the development of modern early childhood education in Ethiopia. It also briefly discusses the preparation of early childhood education teachers and provides an overview of policy directions and strategies in the country. The article concludes with a reflection on the current state of early childhood care and education and its future prospects in Ethiopia.

Keywords: Early child care, child rearing practices, traditional early childhood education, modern early childhood education, quality service

Introduction

Studies indicate that the quality of interaction between children and their parents or caregivers in the family or community is a crucial factor in the human development process (Klein et al., 2001). In the early years of development, young children naturally seek interaction through babbling, facial expressions, and gestures. Adults tend to respond with the same gestures. This is the pre-linguistic period when nonverbal interaction is the most important. If such responses are absent, if brain architecture does not form as expected, or if responses are unreliable or inappropriate, this can lead to inequities in learning and behavior in later developmental years (Harvard University, Center on Developing Child, 2017). According to mid-20th century theories of child development and many other miniature models, empirical studies, and practical interventions, early childhood experiences are critical for rapid development of the brain, cognitive skills, and language development. The human brain develops strongly particularly in the first five years of life, with nearly 85% of the "sculpting" of the brain's neurological architecture occurring between birth and age five (Heckman, 2011 in Blondin, 2011).

Numerous data from economics, biology, and psychology show that educational equity is not only a social justice imperative, but also an economic imperative with far-reaching implications for a nation (Heckman, 2011 in Blondin, 2011). The importance of early childhood development is powerfully demonstrated by an examination of the predictors of learning achievement in primary and secondary education (Britto, 2012). Research from high-, middle-, and low-income countries has shown that children who are prepared for school or enter school "ready to learn" are more

likely to be successful in school, have better learning outcomes, and are less likely to drop out or repeat a grade, thus reducing budgets (Naudeau, et al., 2010).

More broadly, interest in early childhood care and education is part of a global trend in which several nations have made substantial gains in gross enrollment rates (GER) in preschool between 1999 and 2010. For example, the global average GER increased from 32% to 48%, while in low-income countries it increased from 11% to 15% (UNICEF and UNESCO, 2012). In addition, the global trend points to the emergence of multisectoral interventions and the expansion of preschool education, as in Ethiopia. A research report by QESSP (2016) highlights this trend as follows:

> *Increasingly, countries have multi-sectoral policies that encompass education, nutrition, and social protection; 76 countries in 2014. Forty countries have instituted compulsory preprimary enrolment. It remains the case; however, that (on a limited database) gross enrollment in preprimary education in low-income countries is 19%, while in lower-middle-income countries it is 50% (weighted averages). Private provision accounts for 31% of this enrollment. However, patterns vary from country to country. Some countries have expanded their preprimary provision significantly in recent years, for example, Vietnam 77% and Kasakhstan 58%.*

The UN Sustainable Development Goal states that, by 2030, countries should, "ensure that all girls and boys have access to quality early childhood development, care, and pre-primary education so that they are ready for primary education" (UN, 2015, n.p.).

Early Child Care in Ethiopia

In Ethiopia, studies on early psychosocial care and development are scanty and fragmented. Most research focuses on health, nutrition, and sanitation, which are critical to a child's survival and overall well-being. However, the psychosocial component, which is one of the most important elements for an overall child development, has not received due attention. Moreover, studies show that mothers bear most of the burden of early child care and nurturing, even though older siblings and grandmothers have a stake in the child's upbringing. In addition to other household responsibilities, mothers typically care for their children's health, nutrition, and hygiene. That is, mothers are primarily responsible for feeding, washing, and clothing their children and keeping them safe, healthy, and clean (Klein et al., 2001).

Interestingly, in such practices, grandmothers and even neighbors help new mothers and train them to develop the skills necessary to properly handle their newborns, including hugging, feeding, washing, and dressing. New mothers may need quite a while to practice these basic skills freely. In rural areas, it is common to see mothers carrying infants and toddlers on their backs or stomachs. This is usually done until the child begins to walk independently at about one and a half years of age. They carry their children when they perform domestic duties at home, go to the market, or work on their farms. However, if grandmothers, younger siblings, especially girls, or reliable neighbors are at home, they usually take turns caring for the child, for example until the

mother returns home from market. The role family members, neighbors and the extend family play in the course of child care and development is invaluable tradition that should be maintained in our society

On the other hand, fathers' involvement and participation in child care, especially in the early years of development, is often limited. However, studies show that fathers' roles gradually increase over time, especially in urban areas. Indeed, across the country, there remains a need to increase fathers' involvement in early childhood care and management to support mothers. Building the necessary emotional bond with the child at the right time through playing, hugging, feeding, washing and sharing feelings has a positive long-term impact not only on the child's overall growth, but also on the trustworthiness of their relationship. Studies also show that smiling, eye contact, sharing of feelings, physical contact, body language, and other types of nonverbal communication are crucial to the development of the child's brain (Fuglesang, 1994; Klein et al, 2001). Ethiopian parents, especially mothers and caregivers, need to be sensitized to the fact that good parent/caregiver and child interaction and early stimulation are essential components for holistic development, along with nutrition, health, and hygiene. This is not to say that some of these features are not present in the traditional mother-child dyad; rather, it is to make mothers aware of their role in child development so that they can exercise it consciously and intentionally in their daily interactions. Indeed, it is to make parents what they do with the child during this critical period of development is crucial for the child's development, success in education and life in general. A longitudinal study of mothers of young children in one of the kebeles in the Kechene community in Addis Ababa has reported that the presence of such gaps in mother-child interactions (Teferra in Klein, 1996). There is evidence that society in general understands the impact of early child care and nurturing on later developmental years. On the other hand, there are misconceptions and traditional childrearing practices that hinder adult-child interaction and thwart the holistic development of the child in one way or another. For example, the following Amharic proverbs or metaphors demonstrate society's understanding of the importance of early experiences for a child's later behavior (Teferra in Odom et al, 2003):

"ልጅን በጡት እህልን በጥቅምት።።" (*Lejen betut ehilen be t'kimt)* [The time of breast-feeding is the right time for molding a child's behavior, as the month of October is the right season for crop harvest]

"ዛፍ በልጅነት ይታረቃል።።" *'Zaf belejenet yetarekal'*

[It is easy to straighten a tree during its nursery stage]

"የሚያጠግብ እንጀራ ከምጣዱ ይታወቃል" *(Ye'miyategeb enjera keemetadu Ya'stawuqal)* [An *injera* that is satisfying is known from its traditional baking pan]

"የሚያድግ ጥጃ ከገመዱ።።" (Ye'miadeg Tija Kegemedu) [A Calf that grows is known from the rope]

In different languages there may be more or less proverbs with similar meanings, for example, in Afan Oromo as 'Adeemsiganamaannamahafa'.

Such deeply rooted proverbs have far-reaching implications for the public's understanding of the importance of early childhood care and management. In addition, there are invaluable traditions associated with children in a playful format in Amharic storytelling "ተረት-ተረት- የመሠረት" 'Teret-Teret-Yemeseret' and riddle-type "እንቆቅልሽ-ምን-አውቅእልሽ" ' Enkok-Elish-Men-Awk'elish'. The riddle game involves a question and answer round, which can be followed by some sort of positive or negative reward depending on whether you are on the right track or not. Similar and related games exist in other languages, e.g., Oduu Durii and Nati Asguri; and Hibbo Hiphi and Tinkkuta, Tinko Tinko Tinkirib in Afan Oromo and Kambatgna, respectively.

These are playful and joyful traditional events held among peers, parents, grandparents, relatives, or the elderly, and are often held in the evening at home or outdoors. Nowadays, however, this is only the case in some families, especially in rural areas. Such informal platforms are instructive, contributing not only to children's cognitive, sociocultural, and moral development, but also improving social skills and fostering good relationships. Nevertheless, these useful communicative practices tend to disappear as the habits and lifestyles of families and communities change due to modernization and other factors. These customs are gradually disappearing in today's society, especially among urban dwellers. Finally, the long-standing and extensive breastfeeding habits of Ethiopian mothers should be preserved and passed on to the new generations. It is encouraging to note that this practice is still intact in rural areas, while it is gradually declining in urban areas due to the changing lifestyle of mothers. Mothers are usually employed in public, private or non-governmental organizations and have little time to take care of the infant. Nowadays, the establishment of day care centers in some workplaces provides mothers with the opportunity to closely observe and breastfeed their children. This is an encouraging move that should be practiced across the country both in public and private institutions.

In contrast, there are conservative traditions that are deeply rooted with misconceptions about children's abilities and behavior. Misconceptions that discourage play and interaction with children and belittling children's work have negative effects on children's development. For example, the following metaphors illustrate some of the unpleasant beliefs that impede adult-child interactions and misconceptions about the quality of behaviors (Teferra in Odom et al., 2003):

"ከልጅ አትጫወት ይወጋሃል በእንጨት።።" (*Kelej atch'awet yewogahal bench'et)* [If you play with a child, s/he will poke your eyeballs out]

"ከልጅ የዋለ ልጅ አከለ።።" (*'Kelej yewale lej akele)* [Anyone who spends time with a child will become a child.]

"ልጅ ያቦካው ለራት አይበቃም።።" (*Lej yabokaw lerat aybek'am*') [Children's dough won't be sufficient for a dinner]

"ልጅና ፊት አይበርደውም።።" (*Lejena fit ayberdewum*) [A child and human face can endure cold.]

"ዝምታ ወርቅ ነው።።" '*Zemeta Work New* [Silence is as valuable as gold.]

Children are the source of joy and hope for every family, society and nation, and it is important to protect them from anything that might harm them as they grow and develop. In Ethiopia, children are often exposed to harmful traditional practices that violate their rights as children. Abusive practices include early employment as herding boys/girls or housemaids where they are subjected to physical abuse such as rape, corporal punishment through beatings with sticks and other dangerous instruments that can cause physical injuries to children. Female genital mutilation (UNICEF, 2015), cutting the uvula, pulling milk teeth, cutting eyebrows (Gebrekirstos et al., 2013), preventing babies from receiving colostrum (CCF, 2016), and corporal punishment are all forms of physical abuse that are still prevalent in different parts of the country (Ogando et al., 2015). During early initiation rites, boys are often intentionally injured through circumcision (UNICEF, 2015). In general, the country observes acceptable and incorrect beliefs, as well as beneficial and harmful childrearing practices. This emphasizes the need for a broad cross-cultural study of indigenous childrearing practices across the country to improve the beneficial practices and eliminate the negative ones.

Indeed, a nationwide, cross-cultural, multidisciplinary study of educational practices in the country is long overdue. Such a study may help preserve and promote useful traditional practices, prevent harmful practices and develop culturally sensitive intervention strategies, and identify, understand and compile state-of-the-art multicultural educational practices. Most importantly, this material could enable teachers, parents, and caregivers to reflect inwardly, cross-pollinate indigenous knowledge, and thus lay the foundation for a healthy, diverse, and culturally sensitive young generation.

Early Childhood Education in Ethiopia

A. Traditional Early Childhood Education

Traditional and modern school systems characterize the history of education in Ethiopia. The traditional system is deeply rooted in the Ethiopian Orthodox Church, recognized as one of the oldest educational systems in the world since the 4th century (Wagaw, 1979). The church school system has been playing an important role in the preservation of traditional Ethiopian education and its faithful transmission to the future generations. It includes various stages, ranging from the basic 'School of Reading' ('Nebab Bet' in Amharic), where reading is mastered to the advanced level of scholarship (School of Commentaries_ 'Metshaf Bet' in Amharic), where church books are carefully read and critically commented upon (Dagne, 1970, 2015).

Traditional church education begins with the mastery of the 'Amharic' alphabet and phonology, reading and reciting religious texts, followed by theology, philosophy, arithmetic, history, poetry, and music (Punkhurst, 1955; Wagaw, 1979). The lowest or first level of the traditional church school, which is called the "house of the alphabet" (Fidel Bet in Amharic), prepares the child for the next level, reading. Even though a teacher appreciates the speed at which students learn to

reach the next level, it takes a long time for the learner to reach the next stage. In fact, the time needed to reach the next higher stage is flexible because it depends on the competence of the individual learner. That is, some children take a long time to reach the next level, while others do it quickly. Active learning, peer teaching, and acceleration are examples of modern pedagogies that have long been used in traditional church-based education in the country. Not only that, they are also well known by practicing inclusive education for children with disabilities such as the Blind.

After the introduction of modern education, the role of the 'Nebab Bet" or 'House of Reading", the lowest level of the "Abinet Timhiert Bet", began to expand in Ethiopia by meeting the needs of children to develop literacy skills in 'Amharic" and serving as a relay for formal education. In the absence of modern pre-primary education in the country, the "Nebab Bet" has played an important role in preparing children to complete primary school.

The following are some of the distinguishing characteristics of traditional preschools:

- They are found in various locations (for example, in a church compound, in a village under shade, or alongside a road);
- They are fairly spread in rural and urban areas;
- Their school size does not typically exceed 20 children; and
- They are facilitated by one teacher popularly known as 'Yeneta' (Dagne, 1970).

In addition, these schools are affordable and easily accessible to rural and urban children. These pre-primary institutions are scattered and located in certain areas of Ethiopia, restricting their accessibility and the participation rate of children. Traditional early childhood education emphasizes child-centered, flexible pedagogy with multiple grade levels and peer teaching, as is the case at all other levels of traditional church education (Teferra, 2010). As mentioned earlier, the time required to complete each level is determined by the learner's speed and performance. That is, there is no under- or over-taxing of children, because some need less time while others need more. A teacher decides whether or not a learner should advance to the next level (Dagne, 2015).

There is a general belief that children who have attended a traditional school perform better in formal education than others. However, in some places, including Addis Ababa, it is notable that some children attend both regular schools and traditional church schools simultaneously during their free time. These traditional preschools have made an important contribution not only to the development of literacy skills, but also to the moral and ethical development of children. It is also known that more recently, traditional preschool programs have become utilitarian rather than religious in their focus on literacy and numeracy (Teferra, 2006). In some parts of the country, such as Dessie, Wollo, children of Orthodox Christian denomination attend these preschool centers along with children from Muslim families. In any case, there is now serious concern that

these traditional preschool centers, with their educational potential, economic advantages, and cultural heritage, are on the verge of collapse.

The contribution of traditional early education and Quranic teaching in Ethiopia has a paramount importance. There is evidence that the origins of Quranic schools in Ethiopia date back to the 7th century. In these centers, children start learning the Arabic alphabet and go through the different stages of Koanic instruction. Koranic instruction is divided into three stages: 'Tehaji or Mejelis', where children learn the Arabic alphabet and read Arabic; 'Elim', where the Arabic language, religious teachings and social norms are taught; and Koranic instruction, which includes high-level translation and interpretation (Dagne, 2016). This segment of traditional education, which has made a significant contribution to Arabic language reading and writing, is an area that needs to be systematically studied nationwide.

B. Modern Early Childhood Education

The emperors Menilek II (1889-1913) and Haile Selassie I (1930-74) developed a solid, albeit limited, primary and secondary education system, laying the foundation for modern education.

Imperial Period: A lot of evidence suggests that modern early childhood education began in 1900 for French children whose parents worked as railway consultants in Dire Dawa (Teferra et al, 2008). There were also English and German preschools intended to serve children from affluent families in Addis Ababa (Mwamwenda, 2014).

From 1908 to 1974, there were 77 Early Childhood Education (ECE) schools for children aged 4 to 6 years. Most of these schools were located in urban areas; there were hardly any in rural areas. Missionaries, private organizations, and the Ministry of National Community Development and Social Affairs (MNCDSA) were responsible for the preschools. The MNCDSA immediately began training preschool teachers and child care workers and explored the possibility of establishing a long-term training program. As a result, a six-month training program for preschool personnel was proposed in 1967. in 1971, MNCDSA launched the first six-month model training course for preschool staff at the Community Center around Ras Desta Sefer in Addis Ababa with the promise that the second batch of trainees would be relocated to Debre Zeit (MNCDSA Report, 1972 in Teferra et al, 2008).

As a result, the Ministry of Education (MoE) became involved in the administration of early childhood education (Mwamwenda, 2014). Traditional church-based and community-based preschools, as well as 'Madrasas' (Koranic schools), were found in both rural and urban areas during this period. As mentioned earlier, children from Muslim families were observed attending traditional church-based preschools to learn Amharic reading and writing for formal school preparation.

The 'Derge' (Military Regime): Following the Socialist Revolution in 1974, women's participation in economic activities increased under the socialist military regime (Derge), leading

to increased demand for childcare services and facilities. During this time in 1981, the Ethiopian Children's Commission was established, with the main task of looking after the rights and welfare of Ethiopian children, educating and promoting them (Mwamwenda, 2014). Later, initiatives such as awareness workshops and seminars were held, and early childhood education was implicitly recognized as part of the Ministry of Education's overall educational goal. Subsequently, a curriculum for ECE teacher education was developed, and a program for the training of preschool teachers was introduced in 1986. The initiative was part of a broader collaboration between UNICEF and the Ministry of Education. The program was implemented on the compound of the 'Etige' Menen (Empress Menen) School, which was renamed 'Yekatit 12' School. It is located in the Gulele sub-city in the Sidist Kilo area. Currently, the school is back to its original name 'Etige' Menen School, which is one of the oldest schools in Addis Ababa. The training center was called 'Menen Preschool Teacher Training Center' (MPTTC). It was a three-month intensive early childhood teacher education program managed by a Director appointed by the Ministry of Education. The Center was staffed by five competent preschool educators as well as part-time staff from the Department of Psychology of Addis Ababa University. The short-term intensive courses include theoretical and practical courses such as preschool pedagogy, child psychology, methodology, practicum, and learning material production. At the end of the training, each graduate has to produce a variety of learning materials to take back to their workplace. The center used to admit about 300 students per year or 100 students every three months. The candidates were recruited through the Ministry of Education from all administrative regions of the country. Participants who had completed eighth grade or higher came from urban kebeles and farmers' associations in their respective regions. The MPTTC produced about 4700 preschool teachers, which can be considered the highest number in the history of preschool teacher education in the country. Most graduates continued to work as principals, teachers, and teaching assistants in public, community, or "kebele" preschools (Teferra , 2010).

More recently, the Ethiopian Education and Training Roadmap has recommended that the ongoing teacher education program of pre-primary education should be upgraded to a diploma level immediately, and that a degree be pursued as a long-term strategy. In addition, the introduction of a competitive teacher recruitment strategy, the development of a comprehensive teacher education curriculum, and the introduction of career development programs have been proposed to improve the quality of services at this level of the education system (Teferra et al. 2018).

Present Country Context: Like other Sub-Saharan African countries, Ethiopia has problems with access to preprimary education, which is the major cause of school dropout, repetition, low literacy and low numeracy, among other problems. The Ethiopian Government has recognized this gap and is working to improve children's chances for a successful life by investing in early childhood education. Early childhood education is the period when children begin to develop learning skills

and cultural scripts that will make them successful in school and beyond. It is proven that a child's success in life must be based on a strong foundation in the early years of life (Teferra, 2003).

Policy and Practice

This section assesses early childhood care and education policies and strategy frameworks as well as the ongoing practices since 1991. Early child care and education requires adequate nutrition, stimulation, social protection, and education to ensure the holistic development of children. In this regard, Ethiopia has issued a Health Policy (1993), an Education and Training Policy (1994), a Development and Social Welfare Policy (1996), and a Revised Family Code Proclamation (2000), all of which emphasize the promotion of holistic child development. The Health Policy (1993) "encourages early use of available health facilities for the management of common childhood diseases..." (Article 10.6). In addition, some areas of health care such as "maternal health care" (Article 10.1), "family planning" (Article 10.2), "maternal nutrition" (Article 10.3), and "optimizing access to and utilization of immunization services" (Article 10.5) related to child health and well-being were included. This Policy emphasizes the importance of active parental involvement in protecting and maintaining family health (Article 10.8). The Health Extension Program (HEP) of the Ministry of Health has deployed an innovative, door-to-door, community-based health care delivery system and has made positive progress in primary health care in the country. The HEP focuses on 17 health areas primarily to improve the well-being and survival of women and children, including hygiene and sanitation, disease prevention and control, and family health services (USAID, 2012). In brief, the program does not directly address the quality of parent-child interactions and tends to neglect the psychological aspect of child development.

The Federal Ministry of Women, Children and Youth Affairs (MoWCYA, 2012), which is responsible for coordinating and enforcing children's rights in the country, makes every effort to eliminate child abuse and neglect. The Family Code of 2000 abolished the power of guardians to impose mild corporal punishment on children. In addition, the Ministry of Education issued a circular listing the permissible disciplinary measures teachers can use to discipline their students that do not include corporal punishment (MOWCYA, 2012). Despite significant efforts by ministries to promote the well-being of children, there are still gaps in areas such as traditional physical and psychological harmful educational practices that require systematic cross-cultural studies and interventions in the coming years.

The Education and Training Policy (ETP) (TGE, 1994), in its section on general objectives (Article 2.1.1), aims to "develop the physical and mental potential and problem-solving capacity of individuals through the expansion of education and, in particular, through the provision of basic education for all." It also emphasizes that "kindergarten will focus on the all-round development of the child in preparation for formal schooling" (Article 3.2.1) to ensure the smooth and holistic development of children during their formative years. Article 3.4.5 goes on to state that teachers

from kindergarten to high school must have the necessary teaching qualifications and competence in the language of instruction, through initial and in-service training (TGE, 1994). In addition, Article 3.5.3 emphasizes that the language of teacher education for kindergarten and primary will be the nationality language of the area. However, the policy leaves the responsibility of pre-primary education to the community and the private sector and dilutes the role of the Ministry of Education. Moreover, the Education and Training Policy Implementation Strategy states pre-primary education should not be a mandatory and top priority, although the government will still be indirectly involved (MoE, 2002). According to the implementation strategy, the role of the Ministry of Education is limited to providing support such as curriculum development, training of preschool teachers, and offering land at nominal lease rates to private investors (MoE, 2002). The first two five-year continuous education sector development programs (ESDP I & II) (MoE, 2002 & 2004) contained little information on this subsector. ESDP III considered early childhood education as one of the most important areas in the education sector. It also stated that the government's goal for this subsector was to support policy development, curriculum design, standards setting, and oversight rather than to build and manage preschools (MoE, 2005).

Meanwhile, through the joint initiative of UNICEF and the Ministry of Education, the first national study on early childhood care and education (ECCE) was conducted in Ethiopia (Teferra et al. 2008). This study, which was sub-contracted by the College of Education of Addis Ababa University, marked a turning point in the history of early childhood care and education development in Ethiopia. Based on the findings of this study, the National Policy Framework for Early Childhood Care and Education (NPFECCE) was developed, endorsed and signed by the three ministries.

The NPFECCE was a step forward in emphasizing the importance of a comprehensive program from conception to the first six years of postnatal development to enhance a child's holistic development. Its vision is to ensure every child's right to a healthy start in life, to grow up in a safe, caring, and stimulating environment, and to reach his or her full potential. To facilitate the implementation of this Framework, the MoE has developed a Strategic Operational Plan to achieve the vision of the policy by improving access and quality of ECCE. The ECCE program consists of four basic pillars, namely (i) parent education, (ii) health and early learning program, (iii) preschools (community-based kindergartens), and (iv) community-based non-formal school preparation. The Document further states that a mother tongue will be the medium of instruction and play will be used as a method to enhance a child's learning experience (MoE, 2010). It was assumed that there would be a strong synergy between the policy framework and the strategic operational plan that elaborates the health, nutrition, care, and education activities to be implemented from the prenatal period until the child begins formal education.

A little later, ESDP IV (MoE, 2010) emerged with relatively comprehensive and clearly articulated statements about the role of the government, the importance and the direction of the

development of ECCE. In it, ECCE is considered as one of the priority areas for the education sector, and the potential of ECCE for the overall improvement of the quality and efficiency of education, the increase of enrollment rates in elementary school, the basis of EFA goals, and the right of the child is emphasized. In addition, the Ministry of Education stated that it would play a leading role in creating a coherent governance structure for ECCE in collaboration with the Ministry of Health and MoWCYA.

Following the NECCEPF and its Strategic Implementation Plan (MoE, 2010), the Ministry of Education, in collaboration with UNICEF, has launched new initiatives with different modalities for school readiness programs such as O-Class, Child to Child, and Accelerated School Readiness (ASR). These new interventions, along with the ongoing preschool programs in the country, have not only dramatically increased the enrollment rate from 5.3% in 2011/12 to 39% (MoE, 2016), but also increased parental awareness and public interest in the program (Tefera et al, 2018). The following sections highlight the characteristics of the three modalities of school readiness intervention programs.

First, the O-class is a one-year (actually 9-month) school readiness program that takes place on the premises of primary schools. It is designed to accommodate only children aged 6 for one year before they enter first grade. Child to Child, on the other hand, is an informal after-school program run by volunteer girls in the fifth or sixth grade in the community. It enrolls children who do not have access to O class. The quality of this program depends largely on the commitment and competence of the volunteers, the availability of space, and the resources needed for the children's learning experience. In most cases, these conditions do not exist locally, and the sustainability of CtC is questionable. Therefore, it is suggested that CtC should not be used as a full-fledged ECE program, but rather as backup support for the ongoing O-Class program. For example, children who need additional support from the O-Class can be referred to the nearby CtC program to receive the necessary support. The third modality, the Accelerated School Readiness program (ASR), is a two-month summer Kiremet program organized by schools for those who do not have access to either O-Class or CtC. That is, it is a very condensed program that can run for 8 weeks either during the summer or before the regular school program begins.

The three school readiness programs focus primarily on children's literacy, numeracy, and environmental awareness, as well as parental engagement in children's early learning and transition to formal education. Preliminary assessments in Ethiopia have shown that the O-Class modality has a high prospect of scalability and feasibility (Britto et al, 2012, Tefera et al, 2018). Studies suggest that O-class is one of the most feasible, useful, and relevant early childhood programs for the majority of marginalized urban and rural children in Ethiopia. This innovation is generally well received, but has drawbacks in terms of consistency and appropriateness of instruction that are not always present in kindergartens (MoE, 2015; MoFED, 2015). It is an

innovative approach that has opened up broader access by dramatically changing the national gross enrollment of pre-primary education from 4.8 percent in 2009/10 to 39 percent in 2014/15 (MoFED, 2015). This figure includes all children enrolled in the new programs as well as those already enrolled in existing programs, i.e., including those operated by municipalities, faith communities, and private and nongovernmental organizations. The most recent ESDP VI (2021/2022) (MoE, 2021) reveals that in 2018/19, the preschool rate GER was 40.7%, a very slight improvement from the 2014/15 baseline (39%). The report also reveals significant regional disparities in access to preschool education, with very high preschool GERs in the capital regions of Addis Ababa (97.6%) and Harari (91.2%) and significantly lower enrollment rates in Benishangul Gumuz (36.7%), Oromia (28.4%), Afar (12.9%), and Somali (7.9%) regions.

The O-Class initiative has been implemented for six years in both rural and urban areas of the country. Because it is a nationwide new initiative, it is not free of limitations; there are gaps and challenges that need to be systematically addressed in the coming years. Recent research indicates alarming concerns about practice that affect the quality of the O-class program (Teferra & Hagos, 2016). According to this study, the following are among the most important issues that deserve the immediate attention of governments and relevant stakeholders:

- Governance and accountability, that is, the absence of a responsible body to closely monitor and follow up O-Class,
- The curriculum focuses on developing pre-literacy and pre-numeracy skills but neglects the socio-emotional dimensions,
- Keeping 4, 5, and 6-year-olds lamped together in the one-year O-Class program,
- Limited space, indoor, and outdoor facilities,
- No standard guideline for recruitment, qualification & salary of teachers across regions,
- Lack of inclusiveness, that is, inaccessible to children with special needs,
- Variability in the daily programs across the O-Classes, that is, in terms of duration some finish early and some have to stay long in the afternoons, and
- Inadequate budget earmarked for the program.

According to the ESDP V in GTP II, 2015, the education system should reach an average gross enrollment rate of 80% in pre-primary education by 2020. This ESDP VI gives the baseline (2018/2019) for GER in pre-primary education for 5-6 year olds as 41.8% and the target for 2024/25 as 74.16%. Furthermore, the participation rate and target for children with disabilities and refugee children were given as 1.3%, 11.1%, 61.2%, and 82.7%, respectively. In the coming years, a combination of modalities such as a three-year kindergarten program for children aged 4-6, a one-year O-class for children aged 6, the Child to Child (CtC) program, and the Accelerated School Readiness (ASR) program will be explored to achieve the target (MoE, 2015). In addition, teachers who teach in these modalities are not adequately trained for each level. Presently, preparation for preschool teacher training in colleges of education is done through a (10+3) diploma program. Practice, however, shows that most teachers are primary school teachers and

dropouts with short training (Teferra & Hagos, 2016). This is a serious gap that requires special attention and should be considered as one of the priority areas to be addressed in general education.

The present policy environment in line ministries, new efforts in the field, and the government's commitment to reach disadvantaged groups in the coming years should contribute to building a democratic and inclusive society. In its draft Universal Education Proclamation, the government has reiterated in Article 5 its commitment to ensure "the right of every child to free and compulsory education" (FDRE, 2021). In addition, ESDP VI is committed to providing free and compulsory pre-primary education and considers preschool education as a key priority for the education sector (MoE, 2021). This is in line with the United Nations 2030 Sustainable Development Goals (SDGs) to ensure that all girls and boys have access to inclusive, equitable, and quality pre-primary education (UN, 2015). Achieving these national and international goals requires systematic coordination and efficient and effective mobilization of the country's available resources. To this end, collaboration among line ministers should begin in the prenatal period and continue throughout the early years of development.

The Way Forward

Following the assessment of early childhood care and education in the country, and given the growing national and global interest in the field, the need to mobilize all key local and international stakeholders in the country is critical. Accordingly, the Government should adopt an open, flexible and inclusive policy to promote different modalities of early childhood care and education to reach children in the country without compromising quality. Regarding early care, the initiatives of the Ministry of Health and MoWSA and particularly the intervention packages of the Health Extension Program, should include a child care and management component that promotes the psychosocial dimension, which in one way or another affects the holistic development of the child. In terms of ECE, the Government should focus primarily on the O-Class initiative (School Readiness Program), which has a good chance of scaling up in the Ethiopian context. This is mainly because of its strategic benefits in bridging the gap between rural and urban, rich and poor, girls and boys, children with and without special talents, and regional inequalities in Ethiopia. The O-Class program should be run parallel with support for ongoing government, nongovernmental, community, and private sector preschool programs.

Finally, the pre-primary level in the education system is the foundation period when the desired moral, aesthetic and ethical values can be easily cultivated and promoted. If the causes of violence in a country are to be seriously addressed, the early years of development must be focused on. It is accepted that childhood is a formative period for the acquisition of basic attitudes, values, behaviors, and skills that are formed and structured in later development. Consequently, peace education practices can be effectively incorporated into children's behavioral repertoires when they begin during this important formative and sensitive developmental period. Such an early start

of bottom-up peace building strategies and practices would hopefully guarantee that children can develop their potential and resilience for the ultimate development of a rich, stable, and peaceful society in the country.

In conclusion, early childhood care and education in Ethiopia is an area of great concern and needs urgent attention. In order to improve the quality of services and ensure more equitable access, it is important to consider solutions such as expanding access to services, focusing on the quality of services, and increasing public awareness. Through these efforts, more children may have access to the important opportunity to develop the necessary skills and foundations for lifelong learning.

Given the present situation of early childhood care and education in Ethiopia, it is important to consider measures to address the problems. One solution could be to focus on expanding access to services to provide more children to receive early childhood care and education. The Government and international organizations could invest in building new centers, training more teachers, and providing resources and materials to ensure the availability of quality services. In addition, it might be beneficial to look for ways to make services more affordable for families in poverty and to provide better incentives for teachers to attract more qualified professionals. Another solution might be to focus more on the quality of services. This could include training teachers to use evidence-based teaching practices, implementing quality assurance systems, and developing monitoring and evaluation systems to enhance progress. In addition, investing in research and development to improve the quality of services could lead to the development of best practices that could benefit all children. Finally, focusing on increasing public awareness could be beneficial. Public awareness campaigns could help increase understanding of the importance of early child care and education and its impact on future success. These campaigns could help dispel myths or misconceptions that prevent some families from enrolling their children in early care and education programs.

Following the preceding discussion, due attention should be given to the following areas to improve access and quality of early care and childhood education in the country.

i. Early care and management
   A. Coordinate and promote inter-sectoral collaboration, and integrate early child care and management as an integral part of intervention package in the primary health care, nutrition, child's right and parental education programs.
   B. Encourage the establishment of community-based daycare centers attached to the different working places to allow working mothers to breastfeed and get in touch with their children during the day.
   C. Extend maternity leave to six months or more and introduce a scheme of short leave for fathers so that they can spend some time with the infant.

ii. Pre-primary /School Readiness Program/
   A. Curriculum

a) Design a comprehensive, relevant and inclusive curriculum that covers the holistic development of the child, that is, socio-emotional, cognitive, communication, and psychomotor development.
b) Develop a mechanism to extend the duration of the program to three years so that children aged 4, 5, and 6 will enjoy an age-appropriate relevant curriculum and experience.
c) Contextualize by making it culturally relevant through using local languages and learning materials such as games, songs, stories, and riddles.
d) Employ an inclusive and interactive play-based learning approach which promotes diversity management and learning experience.
e) Provide digital technology to support learning as well as to familiarize children to digital technology.
f) Consider appropriate location, space, indoor and outdoor facilities as well as adequate budget.

B. Teacher Education

a) Develop attractive and competitive teacher recruitment, preparation, and retention mechanisms for preschool teachers.
b) Ensure that teacher training institutions are preparing preschool teachers with qualified staff and relevant curriculum.
c) Conduct need-based continuous in-service professional development for the teachers and caregivers.
d) Design an attractive career development schemes for caregivers and preschool teachers career development within the system.

C. Governance and accountability

a) Assign professionally competent leader/manager in charge of running the Center /O-Class/Preschool/.
b) Make the Center accountable for the 'Woreda' Education Office.
c) Introduce inclusive school policy to promote inclusive culture through appreciation of diversity, team-work, mutual respect and assistance.
d) Promote inter-sectorial collaboration among government and non-governmental actors (such as MoE, MoH, MoWSA, UNICEF, World Bank, Save the Children)
e) Create platforms for experience sharing among schools.
f) Ensure the smooth flow of information and accountability in the system among different actors.
g) Set quality assurance minimum standard for the school readiness program/preschool and; periodically monitor and evaluate to improve the quality of the program.

iii. Parent and community engagement
   a) Encourage parents' active involvement in the care and follow-up of the children's education and progress.
   b) Engage the community by mobilizing material and human resources (such as fund raising, sharing indigenous knowledge and values through inviting resourceful persons to participate in storytelling and in caregiving services).

iv. Non-government and private preschools
   a) Introduce incentive schemes and support the expansion of non-government, community-based, faith-based, and private preschools in the country.
   b) Ensure that they are inclusive to accommodate children with disability/ special needs.
   c) Develop mechanisms to upgrade the traditional preschools (Church and Quaranic).

v. Undertake and compile research on traditional child rearing practices across different cultures in the country.
   a) Collect children's indigenous stories, riddles inventories, indoor and outdoor traditional games, and systematically compile resource materials for early learning center schools as well as parents.
   b) Develop and employ play-based learning methods or approaches as to how to use the material.

vi. Budget
   c) Allocate adequate annual budget to run the program.
   d) Make early childhood education free and compulsory.
   e) Mobilize community–based and other resources to support the program.

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Teachers' Knowledge, Attitude and Practices on Visualization Techniques in the Teaching-Learning of Middle School Science and Mathematics Subjects in Ethiopia

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Abstract

This study assessed teachers' knowledge, attitude and practices of visualization techniques in the teaching-learning of science and mathematics subjects in middle schools in Ethiopia. The study employed survey study design. Quantitative data were collected using a self-report questionnaire from 151 middle school science and mathematics teachers selected from two regional states and one city administration of Ethiopia using cluster sampling method. Qualitative data were also generated using interview in order to augment the quantitative data. Both quantitative and qualitative analyses were used to make meaning of the collected data. Results indicated that science and mathematics teachers' knowledge, attitude and practices in implementing visualization techniques were below the average or expected value. There was no significant difference in teachers' knowledge, attitude, and practices of visualization in designing lessons, teaching concepts, exposing students to practice, and assessing students' progress on visualization techniques with respect to gender, qualification, and subject matter. It was recommended that schools provide the appropriate tools, teachers should be given training on how to implement them, the textbooks and teachers' handbook should be revised by incorporating the appropriate visualization techniques, and supporting the teachers in the implementation of visualization.

Keywords: Visualization, Teachers' Knowledge, Teachers Attitude, Teachers Practices, Science and Mathematics Education, Middle School

Introduction

Educational researchers have focused on visualization tools to promote student' learning because they are important in concretizing abstract concepts to help understanding of spatial relationships (Stieff, Bateman & Uttal, 2007), and illustrate an idea that words cannot describe (Linn, 2003).

Guttierrez (1996) defined visualization as a reasoning activity based on the use of visual and spatial elements, mental or physical, performed to solve problems or prove properties. Wileman (1993, p.110) also explicated visualization as "the process of graphically or pictorially representing facts, directions, processes, data, organizational structures, places, chronologies, generalizations, theories, feelings, and attitudes." Bishop (1989) further explains visualization in terms of what of (the product, object or visual image) or *how* of visualizing (the process, activity or skill).

The most commonly used types of visualization techniques for knowledge construction include concept mapping, drawing and real-life applications. Concept mapping refers to the process of geographically representing concepts and their relationships (Anderson-Inman & Ditson, 1999). According to Vekiri (2002) graphic representations allow more efficient information processing than verbal ones, and reduce the demand on working memory; and real-life applications are more concrete. Teachers should teach science and mathematics in a more 'alive' and 'realistic' ways in order to show the application of science and mathematics in everyday life, and to make science and mathematical skills 'accessible' to as many students as possible (Agata, 2000).

Examples, non-examples, counter examples**,** and comparison and contrast are other types of visualization techniques used to develop students' visual ability. Examples are an integral part of mathematical thinking, generalization, abstraction, argumentation, and analogical thinking whereas non-examples are associated with conceptualization and definitions and serve to highlight critical features of a concept and counter-examples are associated with claims and their refutations (Yanuarto, 2006).

Visualization techniques also include experiment, manipulative and computer applications. Experiments have a great potential to introduce the concept of a variable and introduce science and mathematical concepts (Michelsen, 2006). Manipulative (as real objects, models or paper folding) are useful for students to see, touch, sort, take apart, and manipulate physical objects, begin to develop clearer mental images and represent abstract ideas more completely than those whose concrete experiences are limited (Heddens, 1986). Equally animation as a computer application generates a series of frames, where the sequence of frames is determined either by the designer or the user (Betrancourt & Tversky, 2000). Several findings (e.g., Catrambone & Seay, 2002) suggest that animations can be used successfully for delivering abstract contents like mathematical rules, Newton's laws, or computer algorithms.

Review of Related Literature

Previous works by different researchers show evidences about addressing students' conceptual understanding difficulties in learning mathematics through visualization (Duval, 2017). Visualization is a process by which mental representation can be seen to reduce the learning difficulties of students' conceptual understanding. Yet visualization has multifaceted variables of concern that enable better learning and reduce difficulties. Kosslyn, (1996) also described visualization as the creation of a mental image of a given concept. As such and from the teaching point of view visualization seems to be a powerful method to be utilized for enhancing students' understanding of a variety of concepts in mathematics (Rahim & Sawada, 1990). Use of visualization approach provides an opportunity for students to look at mathematics course which was seen as an accumulation of abstract structures and concepts from a different perspective.

Wu and Shah (2004) highlighted the important role of visualization in reducing how much students have to remember. Linn (2003) also found that visualization is useful for interpreting ideas. Visualization is extraordinarily useful in the initial introduction of students to learning science and mathematics as well as in their subsequent stages of the teaching and learning of science and mathematics. It also helps to enhance student verbal or textual explanations of particular scientific concepts (Gilmartin, 1982) and understanding of scientific explanations (Mayer & Anderson, 1991). In addition to that it develops student's abilities (Winn, 1988) while improving their attitude toward learning science and mathematics (Lindquist, 1980). Thus, without instruction that applies visualization techniques students often experience difficulty in interpreting concepts using three-dimensions.

Teachers' Knowledge about Visualization Techniques

Teachers should have extensive background knowledge in order to interpret visualizations (Linn, 2003) and to integrate appropriate visualization tools in teaching-learning, and their pedagogical content knowledge (Shulman, 1986). Nevertheless, teachers also need to have knowledge of the wide range of technologies available and how they support the content to be taught and the best pedagogical approaches to fit the purposes (Koeher & Mishra, 2005). But, practice showed that most teachers do not assimilate computer-skills as technologies change much faster than teachers could manage to use and prepare students to utilize them (Jasute, 2013).

Teachers' Attitude towards Visualization Techniques

The level of confidence and knowledge that teachers possess play a significant role in their attitudes toward technology (Mustafina, 2016). A lack of confidence in one's ability to use technology and a corresponding lack of commitment to using it can add to a teacher's reluctance to integrate technology into the classroom experience (Ertmer et al., 2007). Students' motivation and confidence increase when technology is integrated into classroom instruction. Computer engagement also improves student academic achievement. According to Balanskat, Blamire and Kefala (2006) teachers have a positive perception of visualization techniques but strategies for their effective use are still debatable. Bingimlas (2009) found out several advantages and barriers to the successful integration of visualization techniques where one of the barriers stated by Becta (2004) is lack of teachers' confidence. Lack of confidence also causes lack of competence to integrate visualization techniques into pedagogical practice. Mayer (2001) on his part stated that teachers demonstrated a range of positive attitude for the use of visualization in science and mathematics.

Implementation of Visualization Techniques in Teaching Science and Mathematics

Researches indicated significant positive effects of visualization on the learning achievement of students (Brandt, et. al., 2001); and students learning with visualization was more successful in

conceptual understanding (Serpil et al, 2006). Despite its effect, implementing visualization in science and mathematics seeks designing lessons and exposing students to practice the visualization of science and mathematical concepts and assessing their progress on visualizing the science and mathematical concepts (Mulugeta, 2018).

Designing lessons using visualization techniques: Linn (2003) indicated that learners may be confused by scientific visualizations because they do not have the same background knowledge as the people who created the visualizations. Linn concluded that the appeal of visualizations overshadows the challenges of designing effective material. The concerns in planning were when and how to use different types of visualization in order to maximize their usefulness. To be effective visual representations must first be well designed and visualization object must effectively communicate information to the students (Linn, 2003).

Teaching science and mathematical concepts using visualization techniques: Linn (2003) further explained that instruction is important to ensure effective use of visualizations in science. Without visualization techniques students get difficulties in interpreting three-dimensional information. According to Bransford, Brown, and Cocking (1999), technology can be used to help supply five key conditions for learning such as include real-world contexts for learning; connections to outside experts, visualization and analysis tools, scaffolds for problem solving, and opportunities for feedback, reflection and revision. Graph, diagram, pictures and geometrical shape or models are a tool for visualization of the abstract concept in science and mathematics. By means of these, human reason sets up a relation between physical or external world and the abstract concepts (Konyalioglu et al., 2003).

Exposing students to practice the visualization of science and mathematical concepts: Students' practice on the visualization techniques is important for the students' progress. Therefore, for science and mathematics discourse and mental image, teachers should expose students to practice the visualization of science and mathematics using external visual representation (Phillips, Norris & Macnab, 2010).

Assessing students' progress on visualizing the science and mathematical concepts: Teach students how to work with visualization objects and monitor and assess the appropriateness and effectiveness of visualizations (Cifuentes & Hsieh, 2003).

The Present Study

The quality of learning outcomes in developing countries has been poor (Word Bank report, 2013) and the Ethiopian National Learning Assessments in 2010 (MoE, 2010) and 2013 (MoE, 2013) showed that secondary students' average achievement scores in science and mathematics were very low. For example, the average National Learning Assessment result in mathematics is below

40% (below the expected 50% national standard) for Grades 4 and 8 for the years 2012, 2016 and 2020 (MoE, NEAEA, 2012, 2016, 2020).

In addition, most Ethiopian students do not understand mathematical concepts (Shishigu, 2018); have difficulties in learning and understanding basic descriptive statistical concepts and procedures (Yimam and Dagnew, 2022); have low calculus knowledge and this is due to lack of conceptual knowledge in limit of functions (Sebsibe & Feza, 2020); and they are not equipped with the necessary skills to understand basic algebraic concepts (variables, constructs and sub-constructs) as unknown quantities involved in real-life problem situations (Ketema, 2021).

The students' learning difficulty is related with acquiring the abstract nature and concept of science and mathematics. In addition, traditional science and mathematics teaching mainly cultivates skills neglecting conceptual understanding of the underlying domain (Kadijevic, 1999). These cause students to learn the concepts by memorization rather than visualizing them with understanding. One more important problem associated with the teaching of science and mathematics is students' poor understanding in establishing the relationship between their knowledge and the intuition about concrete structures and abstract nature of science and mathematics.

There are many obstacles and challenges that hinder teachers from effective implementation of visualization. Becta (2004) categorized the challenges as teacher-level (individual), such as lack of time, lack of confidence, and resistance to change, and in school-level (institutional), such as lack of effective training in solving technical problems, and lack of access to resources. Before one tries to see the broader institutional factors, it seems much better to investigate individual factors. Some researches in Ethiopia indicated that visualization technique as well as visualization technique-assisted problem-based learning were found to be useful approaches to improve students' conceptual understanding (Abera et al., 2021) and enhance students' attitude and the components of attitude on Mathematics, Geometry and Algebra (Abera et al., 2022). Moreover, the research findings of Mulat, Mulugeta, and Tadele (2021) indicated that students acquired better visualization, improved understanding, encouraged participation, promoted their team work and individual work, created enjoyable learning environment, boosted their interest, motivation and imagination about Limits using GeoGebra in a multi-teaching environment.

Regarding the effect of visualization in mathematics with respect to sex, program, level of teaching, and year of service, Mulugeta and Demiss (2019) suggested that, with the exception of designing lessons using visualization techniques on which male and female teachers held similar opinions, in the remaining cases, male and female teachers on the one hand and teachers with varying years of experience had similar perceptions. However, while Master's program teachers were significantly lower than Bachelor and PGDT teachers on the one hand, preparatory-level

teachers were significantly lower than primary and secondary-level teachers on account of developing students' visualization, designing lessons using visualization techniques, teaching concepts using visualization techniques, exposing students to practice visualization of concepts, and assessing students' on visualizing concepts. Likewise, teachers with many years of service were significantly lower than those with fewer years of service in developing students' visualization.

Therefore, the purpose of this study was to assess mathematics and science teachers' knowledge, attitude and practices towards teaching science and mathematics using different visualization techniques. Given the importance of visualization, this study assesses teachers' knowledge and attitude towards visualization techniques and how they implement them in the teaching of science and mathematics subjects in middle schools by answering the following questions.

1) What is the level of teachers' knowledge and attitude towards visualization techniques in teaching middle school science and mathematics?
2) To what extent do teachers implement visualization techniques in teaching middle school science and mathematics?
3) Are there significant differences in teachers' knowledge, attitude and practice of visualization techniques in teaching middle school science and mathematics with respect to gender, educational level, and subject area?

Methodology

Research Design

The study used a mixed survey design where data were collected from 50 middle schools in two regions and one city administration of Ethiopia.

Population, Sampling Techniques and Participants

The research sites were Addis Ababa City Administration, Amhara and Southern Nations, Nationalities, and Peoples' Region (SNNPR). The population encompasses all teachers in these study areas. Addis Ababa has ten sub-cities, Amhara thirteen zones and SNNPR thirteen zones. For this survey, ten middle schools (one from each sub-city) from Addis Ababa, twenty middle schools each from SNNPR and Amhara were selected by using cluster sampling. All the science and mathematics teachers (n = 151) in the selected schools were considered as participants of whom 27(17.9%) were from Addis Ababa, 64(42.4%) from SNNPR, and 60(39.7%) from Amhara. By gender, 51(33.8%) were female and 100(66.2%) male teachers. Regarding educational level, 93(61.6%) have diploma while 58(38.4%) have bachelor degree. 49(32.5%) teach mathematics, 27(17.9%) physics, 36(23.8%) chemistry, and 39(25.8%) biology; and 79 (52.3%) of them teach in Grade 7 while 72(47.7%) teach in Grade 8.

Data Collection Instruments and Procedures

Data were collected using questionnaire and interview. A self-reported questionnaire adapted from Alias (2000) and Alias, Black and Gray (2002) were employed to assess teachers' knowledge, attitude and practices of visualization techniques. The number of questions for the variable teachers' knowledge of visualization techniques contains 13 items; for the variable teachers' attitude towards visualization techniques contains 20 items with its components of attitude: confidence in applying visualization techniques in teaching (6 items), usefulness of visualization techniques in teaching science and mathematics (8 items), and enjoyment in using visualization techniques in teaching science and mathematics (6 items). In addition, the variable teachers' practice in implementing visualization techniques contains 34 items with its components: designing lesson using visualization techniques (9 items); teaching using visualization techniques (9 items); exposing students to practice using visualization techniques (8 items); and assessing students' progress (8 items). The type of the questions for all items measure was on a 5-point Likert-type scale.

The adopted instrument was commented for face and content validity by professionals and was also piloted on forty-eight teachers teaching Grades 7 and 8 science and mathematics from Addis Ababa who are not included in the main study. The pilot school is far from the target schools in order to avoid contamination of knowledge about the survey. The Cronbach Alpha values from the pilot study were .831, .724, .733, .734, .817 respectively for teachers' attitude, confidence, usefulness, enjoyment, and knowledge towards teaching using visualization techniques; .953 for implementing visualization techniques in teaching; and .808, .831, .882, .916 respectively for designing lessons, teaching, exposing students to practice, and assessing students' progress using visualization techniques. These alpha values indicated that the subscales have acceptable internal-consistency. Interview guide primarily used to generate data about challenges in implementing visualization techniques in teaching science and mathematics and to support the data collected through the questionnaire. The interview guide was developed by the researchers. The questionnaire was dispatched to all the sampled teachers, and fifty teachers one from each school were interviewed. From fifty interviewed teachers, 25 were from Grade 7 and the others 25 from Grade 8; in addition, 14 were mathematics teachers and 12 each were from the sciences: physics, chemistry and biology teachers. The interviews were audio-recorded and transcribed. While conducting this research, the researchers followed the ethical conducts such as eliciting informed consent, confidentiality and privacy, adhering to beneficence's principle, practicing honesty and integrity.

Results

a) *Descriptive Statistics for Teachers' Knowledge, Attitude and Practices in Implementing Visualization Techniques*

The descriptive statistics for science and mathematics teachers' Knowledge, Attitude and Practices in implementing visualization techniques are presented in Tables 1 – 3. Table 1 presents the descriptive statistics of the science and mathematics teachers' knowledge of visualization techniques.

Table 1

Teachers' Knowledge of Visualization Techniques (N=151)

Variables: I have knowledge of	**Mean**	**SD**
applying *concept map* in my teaching.	3.91	.879
presenting *application of the topic/unit/chapter* at the beginning of a topic.	4.28	.769
giving practical application in terms of projects that are collected from a field.	3.75	.931
giving *application of a concept by examples* under each topic in class.	4.23	.883
explaining concepts using *non-examples* in my teaching.	2.79	1.30
explaining concepts using a *counter example* in my teaching.	3.97	.923
explaining concepts using *compare and contrast* in my teaching.	4.13	.854
using *analogical* representation.	3.54	1.05
experimenting the concepts practically.	3.83	1.02
explaining concepts using *real objects* in my teaching.	4.09	.959
applying manipulative(s) such as *object models/paper-folding/kits.*	3.91	1.02
applying *graphic/pictorial/diagram/chart* presentations in teaching concepts.	4.11	.990
applying *animation or simulation* using computer or software in my teaching.	2.87	1.39
Knowledge of implementing visualization techniques	**3.80**	**.510**

As indicated in Table 1, the aggregate average value of the science and mathematics teacher's knowledge of implementing visualization techniques was slightly below the agreement value 4 (mean = 3.80) with SD = .51. It is indicated that the least average of teachers' knowledge was on applying animation or simulation using computer or software (mean = 2.87) and explaining the concepts using non-examples (mean = 2.79). The highest rated teachers' knowledge was presenting application of a topic/unit/chapter at the beginning (mean = 4.28); followed by giving application of a concept by examples under each topic in class (mean = 4.23); explaining concepts using compare and contrast (mean = 4.13), applying graphic/pictorial/diagram/chart presentations in teaching concepts (mean = 4.11) and applying manipulative (s) such as object models/paper-folding/kits (mean = 4.09). For the remaining items teachers had moderate knowledge.

Teachers were interviewed regarding the visualization techniques in which they have shortage of theoretical and practical knowledge. A mathematics teacher (MT-1) reflected his view on the knowledge of visualization as follows:

I have a shortage of theoretical and practical knowledge. I know nothing about animation, simulation, video, and computer application because there is no computer in the school and no training regarding these techniques. (MT-1)

A physics teacher (PT-1) expressed his reflection about the knowledge of visualization:

I have a shortage of theoretical knowledge and skill gaps in implementing many of the visualization techniques. (PT-1)

Another physics teacher (PT-2) from a different school described:

I have little knowledge about concept maps, giving examples and non- examples but I faced challenges in implementing them (skill and practice gap). (PT-2)

A chemistry teacher (CT-1) from a different school described his understanding of knowledge of visualization techniques as follows:

I am good in using diagrams and demonstration rarely. I have limited knowledge and skill in animations/simulations and applications of the topics. However, I do not have knowledge of the different visualization techniques. (CT-1)

The above interview data are samples of teachers' responses, and others have similar views. Therefore, most of the teachers responded that they had shortage of both theoretical and practical knowledge on visualization techniques; especially on animation, simulation, video and specimen.

Table 2 presents the descriptive statistics of the science and mathematics teachers' attitude and components of attitude towards visualization techniques.

Table 2

Teachers' Attitude Towards Visualization Techniques (N=151)

Variables	Mean	SD
I am sure I understand visualization techniques.	3.97	.989
I doubt that I will improve my teaching using visualization techniques.	2.60	1.23
Visualization techniques are hard for me to apply.	3.19	1.24
I feel confident in applying visualization techniques.	3.69	1.14
I am sure I will improve my teaching using visualization techniques.	4.02	.969
I am not sure which type of visualization techniques are applied to teach a concept.	3.17	1.22
Confidence in applying visualization techniques in teaching	**3.44**	**.561**
Visualization techniques help better students' understanding of concepts.	4.01	1.12
Reasoning and problem solving are complicated using visualization techniques.	2.92	1.25
Visualization techniques do not enhance students' understanding.	3.38	1.33
Visualization techniques improve achievement of students.	4.04	.999
Visualization techniques help reasoning and problem solving of students.	4.12	.894
The results of the students decrease when using visualization techniques.	3.33	1.32
Visualization techniques enhance motivation of students' learning.	4.01	1.01
Visualization techniques enhance frustration of students' learning.	2.92	1.30
Usefulness of visualization techniques in teaching science and mathematics	**3.59**	**.674**

Variables	Mean	SD
Visualization techniques are enjoyable and stimulating to me.	4.02	.941
I am interested and willing to acquire further knowledge of visualization techniques	4.09	.926
I have always enjoyed teaching using visualization techniques.	3.89	.963
Visualization techniques make me feel uncomfortable and nervous.	3.60	1.23
I have never liked teaching using visualization techniques.	3.51	1.33
I would not like to develop my visualization techniques skills.	3.58	1.36
Enjoying the use of visualization techniques in teaching science and mathematics	**3.78**	**.780**
Attitude of teachers towards teaching using visualization techniques	**3.60**	**.576**

Table 2 indicates that teachers' attitude towards teaching science and mathematics using visualization techniques (mean = 3.60) is positive but below the agreement level (Agree = 4). Lowest result was observed in teachers' confidence to apply visualization techniques (mean = 3.44); followed by usefulness of visualization techniques in teaching (mean = 3.59); and enjoyment using visualization techniques in teaching (mean = 3.78).

The teachers had better confidence to improve their teaching using visualization techniques (mean = 4.02). The result also show that teachers believe visualization techniques are useful for reasoning and problem solving of students (mean = 4.12); improving achievement of students (mean = 4.04); helping better students' understanding of concept (mean = 4.01); and enhancing motivation of students' learning (mean = 4.01). Regarding teachers' responses on the enjoyment of visualization techniques, the highest rating was that visualization techniques are enjoyable and stimulating (mean = 4.02); and that they are interested and willing to acquire further knowledge of visualization techniques (mean = 4.09). For the other items teachers had moderate confidence on usefulness and enjoyment in the implementation of visualization techniques.

Table 3 presents the descriptive statistics of the science and mathematics teachers' practices in implementing visualization techniques in teaching.

Table 3

Teachers' Practices in Implementing Visualization Technique (N=151)

Variables:	Mean	SD
In my lesson planning, I include		
concept map and analogy to relate and clarify concepts.	3.59	.954
graphs, pictures, diagrams and charts to practice concepts.	3.96	.832
real-life applications to clarify the understanding of concepts.	3.86	.910
examples to explain concepts.	4.19	.854
non-examples/counter examples in explaining or clarifying concepts.	3.07	1.25
compare and contrast in relating and differentiating concepts.	3.79	.995
experimental activities for clarifying or proving concepts.	3.59	1.19
object models/kits/paper-folding to clarify abstract concepts.	3.56	1.14
video/animation/simulation/specimens by using computer/software applications.	2.58	1.40
Designing Lesson Using Visualization Techniques	**3.58**	**.643**

Variables:	Mean	SD
During my teaching,		
I apply *concept map and analogy* in relating and clarifying concepts.	3.54	.936
I show *graphical, pictorial, diagrammatical presentations* to clarify concepts.	3.87	.899
I show *real-life applications* of concept.	3.67	.971
I explain a concept using *examples.*	4.17	.804
I clarify concepts using *non-examples*/*counter examples.*	3.10	1.18
I use *compare and contrast* in relating concepts.	3.63	1.13
I use *experimentation* for clarifying some concepts.	3.48	1.11
I use *object models/kits/paper-folding* to clarify abstract concepts.	3.60	1.04
I show *video*/*animation/simulation/specimens* by using computer applications.	2.53	1.34
Teaching Using Visualization Techniques	**3.51**	**.660**
During a lesson,		
I ask students to practice *concept maps and analogy* of concepts.	3.68	.935
I give problems for the students in terms of *graphs/pictures* to clarify concepts.	3.67	.907
I provide *real-life applications* for the students to clarify concepts.	3.71	.949
I encourage students to produce *non-examples*/*counterexamples* of concepts.	3.14	1.20
I give activities for the students to practice *comparing and contrasting* concepts.	3.82	.872
I engage the students in the experimentation of concepts.	3.50	1.05
I engage students to produce *object models/kits/paper-folding* to clarify concepts.	3.48	1.03
I encourage students to practice *computer application* in their learning.	2.87	1.32
Exposing Students to Practice Using Visualization Techniques	**3.48**	**.683**
During a lesson or examination,		
I ask students to relate and understand concepts using *concept map and analogy.*	3.63	.991
I evaluate students' work on *graphical or pictorial* application of a concept.	3.60	.918
I assess students' work on *real-life application* problems.	3.58	1.03
I ask students to give *examples/non-examples*/*counter examples.*	3.30	1.07
I encourage students to reflect on *comparing & contrasting* of different concepts.	3.87	.814
I observe and assess students' *experimental activities.*	3.64	1.13
I observe and assess students' learning from *object models/kits/paper-folding.*	3.66	1.08
I ask students whether they understand the concepts from *computer application.*	3.03	1.39
Assessing Students' Progress	**3.54**	**.713**
Practices of implementing visualization techniques in teaching	**3.53**	**.596**

Table 3 indicates that the aggregate average value (mean = 3.53) for teachers' practices in implementing visualization in teaching-learning is below the specified mean 4. Those that caused to show lower rating were designing lessons using visualization techniques (mean = 3.58); teaching concepts using visualization techniques (mean = 3.51); exposing students to practice the visualization of concepts (mean = 3.48); and assessing students' progress on visualizing concepts (mean =3.54).

In planning a lesson, the science and mathematics' teachers frequently include examples to explain concepts (mean = 4.19) with video/animation/simulation/ specimen/computer or software applications (mean = 2.58) least implemented. All other items were moderately implemented in the designing of the lesson. In their teaching as well, the science and mathematics' teachers implement the use of examples to explain concepts (mean = 4.17) most frequently, but they implement least showing video/animation/simulation/specimens by using computer or software applications (mean

= 2.53). The other items were moderately implemented in their teaching. All visualization techniques were moderately implemented in exposing students to practice using visualization techniques; but they implemented least encouraging students to practice the animation/simulation/video/specimens/ computer application in their learning (mean = 2.87). In addition, for the assessment of the students' progress, the science and mathematics' teachers moderately implemented visualization techniques.

Teachers were interviewed regarding the different visualization techniques they implemented mostly, rarely or never at all. A biology teacher (BT-1) expressed his reflection about the practices of visualization as follows:

> *Out of the different visualization techniques mentioned, I used models and kits, specimens as visualization techniques some times in my teaching. (BT-1).*

A mathematics teacher (MT-1) reflected his view on the implementation of visualization as:

> *I used pictorial and graphics, but real- life applications, simulations/animations computer applications were not used at all in my teaching. (MT-2)*

A chemistry teacher (CT-2) from a different school described the implementation of visualization techniques as follows:

> *I implemented mostly graphical, diagrammatical, and pictorial [visualization/presentation]; and rarely used experimentations, examples/non-examples, kits, and compare/contrast; but did not implement at all animations/simulation. (CT-2)*

The above interview data are samples of teachers' responses, and all teachers' interview revealed that the visualization techniques that are mostly used in many of the schools were graphical, pictorial, and diagrammatical presentations. The least used visualization techniques were models, kits, experimentation, examples, non-examples and counter example, real objects and real-life applications, concept maps, paper folding, compare & contrast, and specimens. Animations, simulations, video, and computer applications were among the least used techniques. The reasons for not implementing these were mentioned to be lack of knowledge and resources. Large class size, lack of students' interest to learn, lack of resources, lack of appropriate training of teachers, teachers' overload and lack of laboratory equipment and materials were among the pronounced challenges detected in most schools.

b) ***Teachers' knowledge, attitude and practice by gender and educational level***

In order to examine whether there is a significant difference among science and mathematics teachers' knowledge, attitude and practices in implementing visualization techniques with respect to gender and educational level, independent samples t-tests were used, since the assumptions of independence, normality of the data and homogeneity of variances were met. Even though there

are significant differences in the sample size of male and female groups, we can perform an independent t-test, because equal sample size is not one of the assumptions made in a t-test. The real issues arise when the two samples do not have equal variances, which is one of the assumptions made in a t-test.

Table 4 shows descriptive statistics and independent samples t-test results for science and mathematics teachers' practices in implementing visualization with respect to gender and educational level.

Table 4

Comparison of Means of Teacher's Perceived Practice of Visualization by Gender and Educational Level

Components	Variable		N	M	SD	t	df	p
Designing the lessons using visualization techniques	Gender	Female	51	3.56	.566	-.251	149	.802
		Male	100	3.59	.681			
	Educational level	Diploma	93	3.56	.666	-.551	149	.583
		Degree	58	3.62	.607			
Teaching concepts using visualization techniques	Gender	Female	51	3.48	.636	-.171	149	.864
		Male	100	3.50	.676			
	Educational level	Diploma	93	3.44	.681	-1.61	149	.110
		Degree	58	3.62	.615			
Exposing students to practice the visualization concepts	Gender	Female	51	3.42	.598	-.867	149	.387
		Male	100	3.52	.723			
	Educational level	Diploma	93	3.43	.759	-1.36	149	.176
		Degree	58	3.58	.534			
Assessing students' on visualizing the concepts	Gender	Female	51	3.45	.698	-1.04	149	.299
		Male	100	3.58	.720			
	Educational level	Diploma	93	3.45	.756	-1.87	149	.063
		Degree	58	3.68	.620			
Implementing visualization techniques	Gender	Female	51	3.49	.545	-.548	149	.585
		Male	100	3.55	.622			
	Educational level	Diploma	93	3.47	.633	-1.52	149	.130
		Degree	58	3.62	.522			

In Table 4, the descriptive statistics shows that mean score of male teachers is better than female teachers and degree holder teachers were better than diploma holder teachers in all the variables: designing lessons; teaching concepts; exposing students to practice; assessing students' progress of learning; and practices in implementing visualization techniques. But, the table of an independent samples t-test indicated that the t-values do not reveal statistically significant difference between male and female teachers, and degree and diploma teachers. Thus, the practice of visualization technique implementation is independent of gender and educational level.

Table 5 (*on the next page*) shows descriptive statistics and independent samples t-test results for science and mathematics teachers' attitude towards teaching using visualization techniques and knowledge with respect to gender and educational level.

In Table 5 (*next page*), the descriptive statistics shows that in all the components of attitude and knowledge, female teachers were better than the male teachers, and degree holder teachers were

better than diploma teachers. But the independent samples t-test result indicated that the observed differences are not statistically significant except for the confidence of teaching using visualization techniques at which degree holder teachers were significantly better than diploma teachers ($t(149) = -1.98$, $p < 0.05$). Thus, female and male teachers, and degree and diploma teachers had more or less similar attitude towards implementing visualization techniques, except for confidence.

Table 5

Comparison of Means of Teachers Attitude Towards Using Visualization and Knowledge by Gender And Educational Level

Components	Variable		N	M	SD	t	df	p
Science and mathematics teachers' attitude towards teaching using visualization techniques	Gender	Female	51	3.67	.551	1.02	149	.312
		Male	100	3.57	.589			
	Educational level	Diploma	93	3.54	.560	-1.71	149	.090
		Degree	58	3.70	.594			
Confidence in applying visualization techniques	Gender	Female	51	3.46	.573	.004	149	.997
		Male	100	3.44	.558			
	Educational level	Diploma	93	3.37	.550	-1.98	149	.049
		Degree	58	3.55	.565			
Usefulness of science and mathematics visualization techniques	Gender	Female	51	3.65	.667	.696	149	.488
		Male	100	3.56	.680			
	Educational level	Diploma	93	3.51	.669	-1.87	149	.064
		Degree	58	3.72	.669			
Enjoyment in using science and mathematics visualization techniques	Gender	Female	51	3.93	.795	1.71	149	.089
		Male	100	3.70	.765			
	Educational level	Diploma	93	3.75	.791	-.622	149	.535
		Degree	58	3.83	.766			
Knowledge of implementing visualization techniques	Gender	Female	51	3.81	.442	.396	149	.693
		Male	100	3.78	.543			
	Educational level	Diploma	93	3.77	.531	-.874	149	.384
		Degree	58	3.85	.476			

c) *Teachers' Knowledge, Attitude and Practice by Subject Taught*

Literature depicts that subject nature matters in an attempt to implement visualization techniques. Thus, an attempt was made to check if there is difference in teachers' knowledge, attitude and practice with respect to subjects they teach. For this purpose, one-way ANOVA test was used since the assumptions of independence, normality of the data and homogeneity of variances were met.

Table 6 (see on the next page) shows descriptive statistics and ANOVA results for science and mathematics teachers' attitude and knowledge towards implementing visualization techniques with respect to subjects they teach.

From the descriptive results in Table 6 it seems that biology and chemistry teachers have higher mean scores in the components of attitude and knowledge of implementing visualization techniques. But the ANOVA result indicates that there is no statistically significant difference between subjects they teach in terms of teachers' attitude, confidence, usefulness and enjoyment

towards teaching using visualization techniques, and knowledge of implementing visualization techniques (F = .989, F =.669, F = 1.442, F = 1.274, and F = .459 respectively at p > 0.05). These indicate that the attitude, components of attitude and knowledge of science and mathematics teachers do not differ with respect to subjects.

Table 6

Comparison of Means of Attitude and Knowledge Towards Implementing Visualization Technique by Subjects teachers Teach

Components	Subject taught	N	M	SD	F	P
Science and mathematics teachers' attitude towards teaching using visualization techniques	Mathematics	49	3.51	.545	.989	.400
	Physics	27	3.56	.522		
	Chemistry	36	3.71	.553		
	Biology	39	3.64	.665		
Confidence in applying visualization techniques	Mathematics	49	3.43	.547	.669	.573
	Physics	27	3.34	.655		
	Chemistry	36	3.43	.465		
	Biology	39	3.53	.597		
Usefulness of science and mathematics visualization techniques	Mathematics	49	3.46	.639	1.422	.239
	Physics	27	3.53	.611		
	Chemistry	36	3.73	.635		
	Biology	39	3.67	.776		
Enjoyment in using science and mathematics visualization techniques	Mathematics	49	3.66	.668	1.274	.285
	Physics	27	3.83	.801		
	Chemistry	36	3.98	.775		
	Biology	39	3.72	.885		
Knowledge of implementing visualization techniques	Mathematics	49	3.76	.554	.459	.711
	Physics	27	3.76	.637		
	Chemistry	36	3.82	.454		
	Biology	39	3.87	.403		

With an attempt to check if there is any meaningful difference in the teachers' practices in implementing visualization techniques, ANOVA was calculated and the result did not show any statistically significant difference with respect to subjects the teachers teach (F = 1.005, F = .723, F = 1.343; F = .842; and F = .453 respectively at p > 0.05). These indicated that the science and mathematics teachers have the same practices of implementing visualization techniques in teaching; designing lessons using visualization techniques; teaching concepts using visualization techniques; exposing students to practice visualization of concepts; and assessing students on visualizing concepts in all subjects.

Discussions

Visualization techniques are important in promoting students' learning (Stieff, Bateman & Uttal, 2007), illustrating an idea that words cannot describe (Linn, 2003), simplifying the abstract nature of science and mathematics (Bishop, 1989), working with problems (Rösken & Rolka, 2006), enhancing efficacy (Bagni, 1998), and reducing students' anxiety (Hak, 2014). Therefore, the present study investigated the teachers' knowledge, attitude and practices in implementing visualization techniques in teaching-learning of science and mathematics and to check whether

there is difference with respect to gender, educational level and subject they teach to elucidate recommendations.

Descriptively teachers' knowledge and practices in implementing visualization techniques were found to be below average. This was especially due to teachers' lack of knowledge in explaining concepts using non-examples and applying animation or simulation using computer or software. But teachers seem to have positive attitude towards visualization techniques. It was also revealed that science and mathematics teachers had similar knowledge, attitude and practices of implementing visualization techniques with respect to gender, educational qualification, and subject they teach except for confidence at which degree teachers are slightly significantly better than diploma teachers in teaching using visualization techniques. If training duration and level affects their confidence, it is worth studying further. Linn's (2003) showed that teachers need extensive background knowledge in order to interpret visualizations; Koeher and Mishra (2005) also indicated that teachers need to understand the different technologies available that support the content to be taught and the best pedagogical approaches to fit the purposes. In this regard, the respondent teachers had sufficient experience, but results did not show consonance of these. However, the result of this study is consistent with the study of Jasute (2013) indicating that most teachers have not assimilated technology usage. For teachers' attitude, the result is consistent with the findings of Balanskat, Blamire and Kefala (2006) and Mayer (2001) who indicated that teachers had a positive perception of visualization tools; but Becta (2004) indicated that lack of teachers' confidence is one of the barriers to the successful integration of visualization techniques in teaching and learning environments.

Teachers' practices in implementing visualization techniques are shown to be low, even though, visualization helps to enhance students' conceptual understanding (Serpil, Cihan, Sabri and Ahmet, 2006). The current study tells us weak implementation of the visualization techniques. The result of the study is consistent with the study of Jasute (2013) mentioned above. In order to implement visualization techniques in the classroom, teachers should prepare beforehand in their planning what type of visualization techniques they need to use for a specific topic, when to use that, at which level (introduction, presentation, conclusion and assessment level) is it appropriate and how to use it, including knowledge about it and whether students can practice it. In addition, teachers need to teach the lesson by integrating the visualization techniques with the content to simplify the abstract nature of the contents, connecting the lesson with real-life contexts, and using it for problem-solving. It is also worthy to help students to practice it and solve problems by using visualization techniques. Finally, teachers should use visualization to assess the students' learning progress.

Conclusion and recommendations

All researchers agree that visualization techniques are helpful in the teaching-learning of science and mathematics, but this is true only when teachers have necessary knowledge and positive attitude towards visualization techniques. Generally, this study revealed problems in science and mathematics teachers' knowledge and practices in implementing visualization techniques and particularly teachers lack of knowledge in explaining concepts using non-examples and applying animation or simulation using computer or software. But science and mathematics teachers have positive attitude towards visualization techniques. These indicated that an intervention should be taken in order to improve the knowledge and implementation practices of teachers for different appropriate visualization techniques.

Therefore, for proper implementation of visualization techniques it is recommended that appropriate tools should be provided to schools, teachers should be trained on how to implement them, the textbooks and teachers' handbook should be revised by incorporating appropriate visualization techniques. Finally, teachers also need to be supported during implementing visualization techniques in their mathematics and science lessons.

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Biology Teachers' Metacognitive Awareness of Teaching: The Case of Biology Teachers in Postgraduate Diploma in Teaching Program

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Abstract

Metacognitive awareness of teachers has been considered as an important focus area of educational research. The objective of this study was to examine metacognitive awareness of biology teachers. The study used a descriptive research method. The study involved 90 biology teachers enrolled in summer I and II postgraduate diploma in teaching program. Data were collected using the 24-item Metacognitive Awareness Inventory for Teachers (MAIT) developed by Balcikanli (2011). The analysis was made using an independent sample t-test and a one- way ANOVA. The results revealed that the biology teachers have a high level of metacognitive awareness of teaching. No significant differences were found in metacognitive awareness in relation to teachers' gender, bachelor degree program and teaching experience. However, a significant difference was found out between gender, bachelor degree program and teaching experience in the planning sub-component of metacognitive awareness. The finding indicated that female teachers were better aware of planning than males with respect to bachelor degree program and experience. Moreover, there was a significant difference in awareness to the subcomponents of knowledge of cognition. The result indicated that Biology teachers were more aware of declarative knowledge than procedural knowledge. Although there was a variation in some components of metacognition, biology teachers attending postgraduate program had high metacognitive awareness.

Keywords: *Biology teachers, Metacognitive awareness, PGDT program*

Introduction

Education plays a key role in the social, political and economic development of society. Teachers are one of the most important determinant actors in an education system. Quality and access of education depends on the quality of teachers. Since 1994 the Ethiopian government has made numerous changes in teachers training programs to solve various problems and prepare quality teachers. But still now, there is no stable teachers training program in the country. As a result, there has been continuous change in teachers' training program such as Teacher Education System Overhaul (TESO), Postgraduate Diploma in Teaching (PGDT) and currently Bachelor of Education (B.Ed.) degree program.

In the 21st century, teachers are expected to adapt themselves to using modern teaching approaches that put the students at the center of the teaching learning process so as to enhance their performance. Ethiopian teacher education program lacked the integration of pedagogical and psychological aspects of education with the content they teach. This raised a question about teachers' qualification and competence in teaching profession. Since 1994 the Ethiopian government has made a lot of changes in the education system to solve different problems. It has given great emphasis to science and mathematics education, the student-centered approach and teacher training program (MoE, 2002; Education and Training Policy, 1994). Despite the fact that

the government did a lot, many problems in our education still remained unsolved. For instance, in relation to academic achievement, students are still unable to attain even the minimum learning competencies expected of them by the Ministry of Education. This is evident when we look at the Ethiopian Baseline National Learning Assessments of Grades 10 and 12, 2009 (NAE, 2010) and Ethiopian 4th National Learning Assessment of Grades 4 and 8 achievement results (NEAEA, 2013; 2018, 2021).

According to Mai (2015), although there are many factors regarding the problem of teaching and learning process, teachers are among the first people that will be questioned when it comes to problems or students' low performance. Of course, students' performance depends on how teachers have been trained and how they manage their teaching and their students' learning. It is highly believed that knowing what teachers know about their own teaching and the learning of their students are important issues in teacher preparation (Balcikanli, 2011). Teachers' ability to know about their own teaching and their learners learning depends on their metacognitive awareness (Yavuz & Memiş, 2010). Hence, metacognition is an important concept in the teaching-learning process.

Metacognition

Flavell (1976) defined metacognition as a person's knowledge about his or her own cognition and about the control he or she has over it. Moreover, metacognition refers, to the active monitoring and consequent regulation and orchestration of processes in relation to cognitive object or data (Choudhury & Chowdhury, 2015).

Metacognotion has two components, namely, knowledge of cognition and regulation of cognition (Brown,1987; Schraw & Dennison, 1994; Schraw & Moshman, 1995; Schraw, 1998; Schraw, *et al*., 2006; Choudhury & Chowdhury, 2015). Knowledge of cognition is knowledge about a person's cognitive processes and knowledge about strategies and when, how and where to use them (Brown, 1987; Jayapraba, 2013; Schraw, 1994; Titus & Annaraja, 2011). Knowledge of cognition has three subcomponents, namely, declarative, procedural, and conditional knowledge (Schraw, 1998; Sperling, *et al*., 2004; Schraw, *et al*., 2006).

Declarative knowledge refers to knowing ourselves and knowing what factors affect our performance (Schraw, et al., 2006) whereas procedural knowledge refers to knowing how to do things and knowing which one and how to use strategies (Schraw, 1998; Schraw, et al., 2006). Conditional knowledge refers to knowing the why and when aspects of cognition (Schraw, 1998). It directs us when and why to use these strategies according to the situation and to select the best strategy at the right time while performing a task (Schraw & Dennison, 1994; Schraw, et al., 2006). In short, conditional knowledge refers to knowing when and why to use declarative and procedural knowledge (Garner, 1990).

Regulation of cognition on the other hand refers to activities regarding self-regulatory mechanisms during an on-going process (Jayapraba, 2013; Schraw, 1994; Schraw, 1994; Titus & Annaraja, 2011). It includes at least three components, planning, monitoring, and evaluation (Jacobs & Paris, 1987; Schraw & Moshman, 1995).

Planning refers to the selection of appropriate strategies and allocation of resources that affect performance to achieve the desired outcome (Schraw, 1998). Planning includes goal setting, activating relevant background knowledge, and budgeting time. Previous research suggests that experts are more self-regulated compared to novices largely due to effective planning, particularly global planning that occurs prior to beginning a task (Schraw *et al.,* 2006). Monitoring is an on-line awareness and checking comprehension and task performance which include the self-testing skills necessary to control task performance (Schraw *et al.,* 2006). Evaluation is the appraisal of the performance outcomes and efficiency of one's task performance (Brown, 1980; Schraw *et al*., 2006). It also refers to assessing the products and regulatory processes of one's task performance. Typical examples include re-evaluating one's goals, revising predictions, conclusions and consolidating intellectual gains **(**Schraw, 1998; Schraw *et al*., 2006).

Role of Metacognition in Teaching

According to Mai (2015), metacognition plays an important role in teaching, learning, social cognition, attention, self-discipline, problem solving, communication and personality development. Metacognition has its own critical role for teachers to be successful in teaching and learning (Titus & Annaraja, 2011). A high level of metacognitive awareness is critical not only for teachers but also for students (Memnun, 2014). An effective teacher understands cognitive processes and features of the processes and structures and how to increase students' awareness of how those structures and processes can be used more effectively (Livingston, 1997). Metacognition enables teachers to regulate their teaching activities according to students, goals and situation (Hartman, 2001). It also helps the teachers to plan, monitor and evaluate thinking processes and products. Moreover, it equips the teachers with what information/skills/strategies they have, when, why and how to use them. Lack of metacognitive awareness limits teachers' ability to be effective in the classroom (Tüysüz *et al*., 2008).

Teachers face many challenges in the classroom while teaching, for instance, diversity of students in learning style, culture, background, etc. Therefore, they need to adjust their teaching strategies, materials and classroom environment to engage all learners. Conditional knowledge enables the teacher to adjust to the changing situational demands of each task in relation to diversity of students (Schraw, 1998). It helps them to selectively allocate resources and use strategies more effectively (Reynolds, 1992).

For successful teaching and learning process, teachers must be conscious and continually monitor and evaluate their own teaching behavior (Ya-Hui, 2012). This includes the manner in which the teaching process is developing, the efficiency of their teaching strategies, the quality of interaction

with students, understanding their own teaching and feelings, as well as the students' thinking and feelings, and changing teaching strategies if required. Moreover, studies indicated that the ability of teachers to reflect and think about their own teaching is a crucial part of self-regulation; monitoring and evaluation (Ya-Hui, 2012).

Titus and Annaraja (2011) indicated that teachers' planning of the way to approach a task, the way of monitoring and evaluation of the progress of a task helps them to improve their competency in teaching. This is because, according to Armour-Thomas (1989) the plans of teachers influence their perceptions and judgments of the objectives of instruction, the learning experiences they design for their students, and the procedures and resources they use for organizing and managing instruction.

Different scholars conducted researches at different times to assess teachers' metacognitive awareness and its effect on their success in teaching and found out that most teachers with high metacognitive awareness of teaching were successful in their work. Research conducted by Yavuz and Memiş (2010) pointed out that teachers have high levels of metacognitive awareness in teaching. Another research conducted by Choudhury and Chowdhury (2015) indicated that majority of teacher educators have average level of metacognition awareness. However, there is a difference in the extent to which teachers are thinking about how they think about their teaching (Tanner, 2012). Science teachers are aware of reasons for choosing each teaching technique, using teaching techniques that worked in the past, and setting teaching goals before start teaching (Mai, 2015).

According to the findings of the study by Choudhury and Chowdhury (2015), there is a significant difference between male and female secondary teacher educators in their metacognitive awareness. The study reported that mean score of male teacher educators is higher than female teacher educators in their metacognition awareness. However, a study conducted by Aydın and Coşkun (2011) shows that no significant difference was found in metacognitive awareness of male and female teacher educators.

Studies showed that teachers who demonstrate a wide range of metacognitive skills perform better in their teaching and complete work more efficiently (Titus & Annaraja, 2011). If teachers have metacognitive awareness, they think about their own thinking regarding instructional goals, teaching strategies, sequence, materials, students' characteristics and needs, and issues related to curriculum, instruction and assessment before, during and after lessons (Mai, 2015). Moreover, teachers think about how teaching will activate and develop students' metacognition, or thinking about their own thinking as learners (Rahman, 2011). This is an important ingredient of modern teaching learning process in which students are able to grasp knowledge that can help them in their day-to-day life and become self-directed learners. Hence, teachers should have to develop higher metacognitive awareness so that they perform their work efficiently and become successful

in their profession and can train their students to develop metacognitive awareness that helps them in successful learning.

Therefore, as it is clearly stated by Mai, (2015), metacognitive awareness of teachers is regarded as an important factor in increasing their career's success, their creative and critical thinking, and building self-confidence. However, despite the fact that metacognition in teacher education is a crucial issue, insufficient empirical research has been conducted on the use of metacognition by teachers (Ya-Hui, 2012). Similarly, there has not been any research examining the levels of metacognitive awareness of biology teachers in the literature in Ethiopian context. As a result, it is very important to determine the level of metacognitive awareness of biology teachers in Ethiopia.

Research questions

Previous research confirmed that those teachers who are metacognitively aware can perform their task effectively and they are successful in their teaching profession to enhance students' performance. Hence, investigating metacognitive awareness of teachers in Ethiopia becomes an important research area to enhance their success in their teaching. Accordingly, research questions for this study were as follows:

1. What is the level of metacognitive awareness of biology teachers in the PGDT program?
2. Is there any significant difference between biology teachers on their metacognitive awareness levels across gender and degree program attended?
3. Is there any significant difference on metacognitive awareness levels among biology teachers in terms of major components of metacognition?
4. Is there any significant difference on metacognitive awareness levels among biology teachers in terms of sub components of metacognition?
5. Is there any significant difference on metacognitive awareness levels among biology teachers in terms of teaching experience?

Research Method and Design

There are different research methods and designs used to uncover new information, create better understanding and solve problems in the world. In this study, quantitative research method and descriptive survey research design were used.

Research method

A research method is a strategy, assumption and process utilized in the collection of data to uncover new information for better understanding of a problem and it is used to implement a plan of a research. There are different research methods, namely, qualitative, quantitative and mixed research methods. In this study, quantitative research method was used because the research was aimed at generating knowledge about the level of metacognitive awareness of teachers using questionnaire as data collecting instrument.

The Research Design

Research design is a plan that shows how to collect data and analyze data to answer a research question by discovering new information to understand the problem. In this study, a descriptive survey design was employed. This is because a descriptive survey design allows a researcher to gain knowledge to make informed decisions about the research problem. It also enables the researcher to collect data from large population and allows respondents to answer questions freely. In this design, researcher developed questionnaire that helped to obtain quick information directly from the primary source was used.

Sources of Data

The sources of data in research can be primary or secondary sources. In this study, the sources of data were primary sources. Data were collected directly from biology teachers who were enrolled in the PGDT program in the Department of Science and Mathematics Education, College of Education and Behavioral Studies, Addis Ababa University.

Sampling

Using purposive sampling method, biology teachers were selected from science departments (chemistry and physics teachers) who were enrolled in the PGDT program. All biology teachers participated in the study because their number was considered manageable. The participants of the research were 90 biology teachers in the postgraduate diploma in teaching program at Addis Ababa University, College of Education and Behavioral Studies, Department of Science and Mathematics Education. Of the total number, 52 were males and 38 females. All of the participants have Bachelor's degree in biology but attended their programs in different delivery modes. That is, 43 of them obtained their Bachelor degrees in regular program while 47 of them obtained their Bachelor's degree in summer program.

Instrument

In this study, the researcher used Metacognitive Awareness Inventory for Teachers (MAIT) developed by Balcikanli (2011). This instrument consists of 24 items with 5-point Likert –Scale questions ranging from (1) "strongly disagree" to (5) "strongly agree". The highest point to receive from this 5-scale Likert type inventory is 120, the lowest point is 24. Balcikanli (2011), reported the Cronbach's Alpha results of the questionnaire internal consistency with alpha coefficient of 0.88. This means that the instrument has a good reliability and can be used to measure the science teachers' awareness about metacognition.

Techniques of Data Analysis

Data obtained through questionnaire were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0 statistical software. Independent sample t test, and one way ANOVA were employed in analyzing the data.

Results

The main aim of this study was to investigate biology teachers' awareness about metacognition in teaching in general, and to investigate if there was a significant difference in metacognitive awareness between them in terms of their gender, program through which they obtained their Bachelor's degree in biology, service year and components of metacognition in particular.

After collecting data using metacognitive awareness inventory for teachers (MAIT), first the reliability of items and normality of the data were checked. The data were normally distributed and had acceptable internal - consistency reliability with Cronbach's Alpha of 0.87 which is similar with internal consistency Cronbach's Alpha of 0.88 reported by Balcikanli (2011). After checking the reliability and normality, inferential statistics such as independent t test and F test were used to see if there were significant differences among the various groups.

Table 1

Means and Standard Deviations Comparing the Metacognitive Awareness of Biology Teachers

Metacognitive awareness	N	M	SD	levels
General Metacognition Awareness	90	4.07	.53	High
Knowledge of cognition	90	4.04	.42	High
Declarative knowledge	90	4.17	.52	High
Procedural knowledge	90	3.90	.52	High
Conditional knowledge	90	4.05	.56	High
Knowledge of regulation	90	4.04	.54	High
Planning	90	4.08	.61	High
Monitoring	90	4.01	.61	High
Evaluation	90	4.03	.66	High

The first research question of this study was what is the biology teachers' metacognitive awareness level? The descriptive statistics result (Table 1) showed that, biology teachers have mean greater than 4 in general metacognitive awareness (M = 4.07) and in major components; knowledge of cognition (M =4.04) and knowledge of regulation (Mean = 4.04). This implies that biology teachers have high levels of metacognitive awareness in teaching. Biology teachers have slightly lower mean in procedural knowledge and higher mean in declarative knowledge of subcomponent of knowledge of cognition. Similarly, they have slightly higher mean in planning and lower mean in monitoring of subcomponent of knowledge of regulation.

The second research question of this study was about whether there was any significant difference between males and females in biology teacher' metacognitive awareness levels or not. From the results obtained, the mean within each of the two pairs looks somewhat different. But the result from the t-test analysis (Table 2) revealed that there was no statistically significant difference between male and female in general metacognitive awareness ($t(88) = -.606$, $p > 0.05$) and in all major and subcomponents of metacognition. This implies that both male and female biology teachers had similar level of metacognitive awareness. However, there was a significant difference between male and female in metacognitive awareness in one of the sub-components, planning

(t(88)= -2.343, p < 0.05). Female biology teachers had better awareness of planning than male biology teachers.

Table 2

Metacognitive Awareness of Biology Teachers in relation to gender

Variables	N	M	SD	t	df	p
Metacognitive Awareness						
Male	52	4.04	.54	.61	88	.55
Female	38	4.11	.53			
Knowledge of cognition						
Male	38	4.02	.44	.32	88	.75
Female	52	4.15	.52			
Declarative knowledge						
Male	52	4.15	.52	.27	88	.79
Female	38	4.18	.53			
Procedural knowledge						
Male	52	3.96	.49	1.14	88	.26
Female	38	3.82	.56			
Conditional knowledge						
Male	52	4.05	.52	.09	88	.93
Female	38	4.06	.62			
Knowledge of regulation						
Male	52	3.97	.53	1.50	88	.14
Female	38	4.14	.55			
Planning						
Male	52	3.96	.67	2.34	88	.02
Female	38	4.26	.49			
Monitoring						
Male	52	3.96	.55	.94	88	.35
Female	38	4.08	.68			
Evaluation						
Male	52	3.99	.66	.66	88	.50
Female	38	4.09	.66			

The third research question was whether there was any significant difference in biology teachers' metacognitive awareness levels in programs they had attended to earn their Bachelor's degree or not. From the results obtained, the mean of the two pairs seems different. But, the result from the independent sample t-test analysis (Table 3) revealed that there was no statistically significant difference between those who obtained their Bachelor's degree through regular and summer program in general metacognitive awareness (t(88) = -.458, p > 0.05) and in all major and sub components of metacognition. However, it was observed that a statistically significant difference existed between those who obtained their degree through regular and summer program in metacognitive awareness of planning (t (88) = -2.222, p < 0.05). Biology teachers who had obtained their degree in summer program had better awareness of planning than those who studied in regular program. This implies that biology teachers from the two programs had similar level of metacognitive awareness except awareness of planning.

Table 3

Metacognitive Awareness of Biology Teachers in Relation to their Degree Program

Variable	N	M	SD	T	df	p
Metacognitive Awareness						
Regular	43	4.05	.56	-.458	88	.65
Summer	47	4.10	.51			
Knowledge of cognition						
Regular	43	4.02	.41	-.457	88	.65
Summer	47	4.06	.43			
Declarative knowledge						
Regular	43	4.12	.54	-.873	88	.39
Summer	47	4.21	.51			
Procedural knowledge						
Regular	43	3.90	.49	-.028	88	.97
Summer	47	3.90	.56			
Conditional knowledge						
Regular	43	3.92	.98	-.195	88	.85
Summer	47	3.94	.98			
Knowledge of regulation						
Regular	43	3.94	.56	-1.709	88	.09
Summer	47	4.13	.52			
Planning						
Regular	43	3.94	.69	-2.222	88	.03
Summer	47	4.22	.50			
Monitoring						
Regular	43	3.89	.62	-1.710	88	.09
Summer	47	4.11	.58			
Evaluation						
Regular	43	3.99	.68	-.579	88	.56
Summer	47	4.07	.65			

The fourth research question was whether there was any significant difference in metacognitive awareness levels of biology teachers in terms of the two major components (knowledge of cognition and regulation of cognition) of metacognition or not. Unfortunately, the mean of the two was found to be the same (M=4.04) and hence there was no difference between biology teachers in metacognitive awareness of knowledge of cognition and regulation of cognition.

The fifth research question was about whether there was any significant difference in metacognitive awareness level of biology teachers in terms of sub components of knowledge of cognition (declarative knowledge, procedural, conditional) and regulation of cognition (planning, monitoring and evaluation). From the results obtained, the mean within each of the three sub components looks somewhat different as indicated in table 1. And further, the result from one way ANOVA analysis (Table 4) showed that there was statistically significant difference in metacognitive awareness between the first three sub components $F(2, 267) = 5.48$, $p < .05$.

To check in which sub component they differ, post hoc comparison was made and the result indicated that there was a statistically significant difference in metacognitive awareness for declarative knowledge and procedural knowledge ($p < .05$). The two groups means indicate that the mean of metacognitive awareness of declarative knowledge (M=4.17) was significantly higher

than the mean for procedural knowledge (M=3.90). This implies that biology teachers had better awareness on declarative knowledge than procedural knowledge. This enables biology teachers to know themselves and factors that affect their performance.

Table 4

One-Way Analysis of Variance Summary Table

	Metacognitive awareness				
Sub components	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.15	2	1.58	5.48	.01
Within Groups	76.77	267	.29		
Total	79.93	269			

There was no statistically significant difference among biology teachers between metacognitive awareness of declarative knowledge and conditional knowledge; procedural knowledge and conditional knowledge.

Table 5

Post Hoc Multiple Comparisons Summary Table

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.
1 Declarative	2 Procedural	.26*	.08	.00
	3 Conditional	.11	.08	.33
2 Procedural	3 Conditional	-.15	.08	.15

The second subcomponent of metacognition includes planning, monitoring and evaluation. From the results obtained, the means of the three subcomponents seem to be different as indicated in table 1. To check this difference one way ANOVA was computed. The result from one way ANOVA analysis (Table 6) shows that there was no a significant difference in metacognitive awareness of planning, monitoring and evaluation $F(2, 267) = .34$, $p > .05$.

Table 6

One-Way Analysis of Variance Summary Table Comparing the Three Sub Components

	Metacognitive awareness				
Sub components	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.27	2	.13	.34	.71
Within Groups	104.91	267	.39		
Total	105.18	269			

The fifth research question was whether there was any significant difference in biology teachers' metacognitive awareness in terms of experience or not. From the results obtained, the mean of the three-year categories of experience are different (Table 7). The mean for experience of 1-5 year (M=4.07), experience of 6-10 years (M=4.04) and experience 11 and above year (M=4.12).

To check this mean difference, F-test was computed. The result from one way ANOVA analysis (Table 8) shows that there was no significant difference among the three categories of experience in general metacognitive awareness, $F = 2, 87 = 0.19$, $p > .05$ and in major and sub components except in sub component of planning, $F = 2, 87 = 3.42$, $p < .05$.

Table 7

Means and Standard Deviations Comparing the Three Experience Year Category

		General metacognitive awareness		Planning	
Experience	**N**	**M**	**SD**	**M**	**SD**
1-5years	43	4.07	.57	3.97	.69
6-10years	29	4.04	.52	4.08	.58
11 and above	18	4.12	.47	4.40	.31
Total	90	4.07	.53	4.09	.61

Table 8

One-Way ANOVA Table Comparing in Terms of Experience

Groups		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
MAL	Between Groups	.12	2	.06	.19	.82
	Within Groups	25.11	87	.29		
	Total	25.23	89			
PLAN	Between Groups	2.44	2	1.22	3.42	.04
	Within Groups	30.98	87	.36		
	Total	33.41	89			

To check this difference, post hoc test was computed and the result (Table 9) indicates that metacognitive awareness of planning for experience of 1-5 years and 11 and above differed significantly ($p < .05$). Moreover, there was a significant difference between experience of 6-10 years and experience of 11 and above years in metacognitive awareness of planning ($p < 0.05$,). Biology teachers with experience above 11 years had a high awareness of planning. But there was no statistically significant difference between experience of 1-5 years and 6-10 years in metacognitive awareness of planning. This implies that teachers with high experience had better awareness of planning.

Table 9

Post Hoc Analysis with Games-Howell Summary Table Comparing Experience for Planning

			Mean Difference		
Dependent Variable	**(I) SYr**	**(J) SYr**	**(I-J)**	**Std. Error**	**Sig.**
Planning	1-5yrs	6-10yrs	-.11	.15	.74
		>11yrs	-.44*	.13	.00
	6-10yrs	>11yrs	-.33*	.13	.04

Discussion

Research findings indicate that metacognition is very important concept in education and has an impact on teachers to be successful in teaching and learning process. It affects teaching and learning process of individuals and plays the main role in self-regulation which is necessary to be successful in teaching and learning. Hence, metacognitive awareness of teachers has an impact on teachers' effectiveness as well as on their students' success. For this reason, determining teachers' metacognitive awareness becomes necessary. That is, this study was aimed at investigating

metacognitive awareness of biology teachers enrolled in post graduate diploma program and to compare it in terms of their gender, degree program and service years.

In this study, it was found out that the levels of biology teachers' metacognitive awareness in teaching were high. They had similar awareness level in knowledge of cognition and regulation of cognition and in subcomponents of regulation of cognition (planning, monitoring and evaluation). However, they differ in metacognitive awareness level of sub components knowledge of cognition (declarative knowledge, procedural knowledge and conditional knowledge). Biology teachers had better awareness on declarative knowledge than procedural knowledge.

This high level of metacognitive awareness of biology teachers implies that biology teachers are effective in regulating their teaching activities, goals and situations and in planning, monitoring and evaluating their work and selecting and deciding when, why and how to use strategies/skills (Hartman, 2001). Teachers with high metacognitive awareness can think about their own thinking regarding instructional goals, teaching strategies, assessment strategies, sequence, materials, students' characteristics and needs before, during and after lessons (Mai, 2015) and how they activate and develop students' metacognition as well (Rahman, 2011). This enables students become independent, self-directed learners instead of solely depending on their teachers.

Diversity of students in learning style, in culture, background, etc is one of the challenges for teacher in classroom to address. Teachers need to adjust their teaching strategies, materials and classroom environment to engage all learners. Metacognitive awareness enables the teacher to adjust to the changing situational demands of each task, selectively allocate resources and use strategies more effectively in relation to diversity of students (Reynolds, 1992; Schraw, 1998). The higher metacognitive awareness of biology teachers, as indicated in the finding of this study, is evidence for teachers' ability to manage the diverse needs of learners and effectively run the teaching learning process.

It was found out that biology teachers had better awareness of declarative knowledge than procedural knowledge, the two sub components of knowledge of cognition. Declarative knowledge refers to factors affecting performance and knowledge about oneself (Schraw, et al., 2006). Procedural knowledge is one's knowledge about strategies and other procedures (Schraw & Moshman, 1995). Declarative knowledge is awareness of self-skills, intellectual capacity and capabilities an individual can attain this knowledge from presentations, demonstrations and discussions (Bulut, 2018). The apparent higher score in declarative knowledge than procedural knowledge might be due to the education system, which focuses on content knowledge. That is, teachers are mainly focused on content knowledge of themselves rather than other instructional issues like pedagogy and technology. The current education system emphasizes the integration of modern pedagogy and technology in actual teaching learning process. Hence, there is a need to work on teachers to increase their awareness on procedural knowledge.

The finding of the current study is supported by previous research (Yavuz & Memiş, 2010; Ya-Hui, 2012; Choudhury & Chowdhury, 2015; Mai, 2015; Batdi, 2016). These studies indicated that teachers at different levels and different disciplines have good metacognitive awareness of teaching. For instance, Yavuz and Memiş (2010) reported that teachers have high levels of metacognitive awareness in teaching. Besides, Batdi (2016) found that teachers have high levels of metacognitive awareness. On the other hand, Choudhury and Chowdhury (2015) indicated that majority of teacher educators have average level of metacognition awareness.

The findings of this study indicated that no significant difference was found across gender in general metacognitive awareness but female biology teachers had better awareness of planning than did their male counterparts. Planning of the way to approach a task, the way of monitoring and evaluation of the progress of a task help them to improve their competency in teaching (Titus & Annaraja, 2011). Because the plans of teachers influence their perceptions and judgments of the objectives of instruction, the learning experiences they design for their students, and the procedures and resources they use for organizing and managing instruction (Armour-Thomas, 1989). Planning emphasizes the selection of appropriate strategies and determination of cognitive skills for effective performance (Schraw & Dennison, 1994). Griffith et al. (2016) stated that the high level of metacognitive awareness of teachers about planning of teaching has a positive effect on their performance and the teaching learning process. Therefore, female biology teachers are better in metacognitive awareness of planning and hence successful in their teaching learning process than their counter parts.

This finding is supported by study conducted by Aydın and Coşkun (2011) that shows no significant difference in general metacognitive awareness of male and female teachers. Other studies reported a significant difference between the teachers' general metacognitive awareness levels in favor of female teachers (Asikcan & Saban, 2018; Rozendaal et al., 2003; Saracaloglu & Cengel, 2013). They reported that female teachers had better metacognitive awareness than male teachers' in general metacognitive awareness. These findings support better awareness of female with respect to planning. However, there are also research findings that reported that male teachers were better than females (Choudhury & Chowdhury, 2015). Hence, there is a need for further research to investigate this in consistency of findings.

The findings of this study revealed that biology teachers who obtained their degree in summer program have better awareness than those who studied in regular program in planning. This might be due to on-the-job experience teachers had.

Findings from teachers experience perspective support the above result. These findings indicated that biology teacher with experience above 11 years had higher awareness of planning than those with experiences below 10 years. But experience had no effect on other components of metacognition like that of degree program they attended and gender. The plans of teachers influence their perceptions and judgments of the objectives of instruction, the learning experiences

they design for their students, and the procedures and resources they use for organizing and managing instruction (Armour-Thomas, 1989). Teachers' planning of the way to approach a task, monitoring, comprehension and evaluate the progress towards completion of a task helps them to improve their competency in teaching (Titus & Annaraja, 2011).

The result obtained from this research is in parallel with findings of the research conducted by Win and Khaing (2011), in which experienced teachers were more aware of planning than inexperienced teachers but contradicts with findings in relation to general metacognitive awareness and other components. Hence, there is a need for further investigation.

Conclusion and Recommendation

The level of metacognitive awareness of biology teachers was high in general and with its indicators, knowledge about cognition and regulation of cognition as well. However, metacognitive awareness in planning varies according to gender, degree program and teachers experience. Female biology teachers who attended degree in summer program and those with high experience had better awareness of planning. Moreover, metacognitive awareness in declarative knowledge, procedural and conditional also varies. Biology teachers had better awareness of declarative knowledge. This implies that even though biology teachers are generally well aware of metacognition, there is a difference in awareness for some components. Teachers have to develop higher metacognitive awareness in all its dimensions so that they can perform their work effectively; help their students to develop metacognitive awareness that help them in successful learning and become successful teachers in their profession.

Hence, there is a need to consider the notion of metacognition in teachers training program, professional development programs and in short-term in-service training on method of teaching. Further research will be mandatory to fill some contradicting results.

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'Emergency Education' in Sweden: Implications for Sustainable Development through Education for Newly Arrived Students

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Abstract

This article reports part of a research project that investigated the learning and social inclusion conditions of 'newly arrived students' in Swedish primary schools in two municipalities. Newly arrived students are the category of students who have lived abroad and started their education in Sweden when they were seven years old or older within the last four years. Most of these children and youth have a history of migration. This article focuses firstly on the Swedish migration context, the 'migration crisis' in 2015 and the changes in the Swedish reception system that took place soon thereafter and, second, ethnographic observations from Primary Schools of two specific perspectives in education, namely a perspective on 'Framing of the day and the lesson' and 'Study tutoring in the mother tongue in regular teaching'. The results indicated that strong supporting structures and structured social interaction are needed as well as caring and empathy on the part of teachers to promote learning and social inclusion of newly arrived students are required. Furthermore, study tutoring in the mother tongue in regular teaching seems to be important while the study tutors' view of their mission varies.

Keywords: education in emergencies, Sweden, migration, 'newly arrived children and youth', reception system, teaching.

Introduction

This paper addresses the theme of 'Education in Emergencies' from a Swedish perspective. We argue, together with many educators in the international community (see Kagawa, 2005; Tawil, 1997), that education for refugees and asylum-seeking children and youth,[i] or as termed in the educational policies in Sweden, education for 'newly arrived students', is a challenging and very important question, not least for societies' social sustainable development. In this article we present and analyse some of the complexities and challenges concerning migration and education in a Swedish educational context. The aim of the research was to explore how newly arrived students' conditions for learning and social inclusion were organised out from a teaching and student perspective. The empirical data were produced in Primary Schools in two medium sized Swedish municipalities during the years 2016 -2018 (see Korp et al., 2019). The results show that teaching and learning in culturally diverse environments are complex and require strategic planning and teachers' interactions out from a consciously intercultural approach (see Akkari & Radhoune, 2022; Gorski, 2008, 2009; Sleeter & Grant, 2009).

The significance of the study is twofold. It contributes to knowledge on migration in relation to the educational context and the reception system in Sweden, a Nordic welfare state. It also contributes to the literature in the field of the teaching of newly arrived students through rich

empirical data and analysis of two specific perspectives in education, namely a perspective on 'Framing of the day and the lesson' and 'Study tutoring in the mother tongue in regular teaching'.

'Newly arrived students' and 'emergency' education

'Newly arrived students' is a category of students who have lived abroad and commenced their education in Sweden when they were seven years of age or older within the last four years (Education Act, 2010:800; 'see Andersson, Lyrenäs & Sidenhag, 2015; Norberg & Gross, 2019).

Under certain circumstances, issues of migration and education can possibly be described as measures of emergency education 'in the South' (Kagawa, 2005), but need to be much more paid attention to and focussed also in the North as argued by Proyer et al. (2019), especially for those over 15 years of age. The international community has recognized this problem and 'education in crisis situations' has become a major concern (Tawil, 1997). Education is increasingly recognized as the 'fourth pillar' of humanitarian response in such crises, along with food and water, shelter, and health care (Kagawa, 2005). Also, the importance of education is underlined in the United Nations 2030 *Agenda for Sustainable Development*, which states that migration and displacement are two global challenges. The agenda needs to be addressed in achieving the Sustainable Development Goal 4: 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all' (UN, 2017; 'see UNESCO, 2019). The issues are extremely important and urgent, also in the Nordic countries of which Sweden is a part. In the following section, we briefly present the Swedish context.

Sweden - part of the Nordic region

Sweden is the largest of the Nordic countries by size and population. With a population of a little more than ten million it is one of the smaller members of the European Union (EU). Like many other European countries, Sweden became a more profiled multicultural society after World War II. Currently, more than 2 million people in Sweden were born abroad, which is approximately 20 percent of the country's population (scb.se[ii]) and Sweden has emerged as one of the most multicultural countries in Europe (Borevi, 2012). As regards language, Swedish is the main language and the language that a majority of those living in Sweden speak. Sweden has also five national minority languages. All five languages received their status when the parliament decided to join the framework convention for the protection of national minorities in Europe back in 1999. In addition to Swedish, many other languages are spoken in Sweden due to recent migration. No statistics are available on the contemporary multifaceted linguistic development in Sweden, but it is estimated that around 200 different languages are spoken (Gezelius, 2019; Parkvall, 2016). From a European and Swedish perspective, education for children and youth in migrant situations is very important, and children and youth in migration are naturally in an 'emergency' educational situation. The emergency of addressing the need of young people in migration context was stressed by the critical theorist Homi Bhabha (2019) who argues:

> *We cannot continue to fail the next generation of young people (and several more to follow) with dramatic shortfalls in access to basic rights such as quality education and health care, rights respecting employment, and access to a safe and life-sustaining environment (2019, p. 84).*

This article aims to present and analyse two specific perspectives on education in relation to the education of 'newly arrived students' and opportunities and obstacles in education from the current Swedish situation in terms of migration and education.

The article is structured as follows; we begin with a discussion of the definition of the concept of emergency to problematise and 'open up' this concept. Then Sweden and migration are described, followed by an introduction to the Swedish Welfare State and the Swedish reception system. This introductory part aims to contribute to the understanding of education, migration, children and youth in a Nordic and Swedish context. The article continues by presenting the aim, method, material, analysis, and findings of a recently completed research project which contributes to the empirical data for this article.[iii] This is done through examples under the headings of 'Framing the day and the lesson' and 'Study tutoring in mother tongue in regular teaching'. The article ends with a concluding discussion of our main findings.

Migration – an emergency situation

The concept of emergency needs to be understood from its political, social, and economic contexts. In the Merriam-Webster wordbook[iv] emergency is defined as an 'unforeseen combination of circumstances or the resulting state that calls for immediate action'. As mentioned by Kagawa (2007), the state of emergency often inhabits a narrow focus on economic development which Kagawa finds problematic, and he argues that the concept needs to address comprehensive development towards quality of life for all. Definitions of 'emergency education' have a reference to education programmes that are organised 'in situations where children lack access to their national and community education systems due to occurrence of complex emergencies or natural disasters (Kagawa, 2007, p. 494) , situations that might naturally overburden a society.

One such course of 'emergency' event recently in Europe and Sweden, was the arrival of many asylum seekers and refugees, especially during the year 2015. The situation was not totally unforeseen, as the world was experiencing several severe conflicts and violence at the time. The war in Syria that started in 2011 forced people to flee their homes to an increasing extent and many people tried to get to the European Union to seek asylum. In addition to the refugees from Syria, refugees and asylum seekers also came from Afghanistan, many as unaccompanied minors. Refugees from several parts of Africa, including Eritrea, Somalia and Ethiopia tried to reach the European Union, too (scb.se[v]).

Both in media and in the societal discourse, these events were reported on and discussed using terms such as 'crisis' (Greussing & Boomgaarden, 2017), 'migration crisis' (Bauman, 2016), and

'European migration crisis' (Norberg & Gross, 2019; 'see Skodo, 2022). The term 'crisis' was in the European and Swedish discourse used both for the conditions that were assumed to be behind the asylum seekers' journey to Europe, including the large number of deaths and drowning accidents, and also for the tasks that many European countries were faced with when they had to care for many asylum seekers in a relatively short time. The discourse built on the assumptions that this 'crisis' was the 'largest and most complex facing Europe since the Second World War' and that the 'EU governments were facing huge policy and practical challenges in determining and addressing the immediate and longer-term needs of refugees and other migrants' (Metcalfe-Hough, 2015). During this period in 2015, over one million asylum seekers arrived in Europe and more than 390 000 in 2016 (Eurostat statistics[vi]). The OECD (2016) concluded that in 2014–2015 Sweden saw the largest per capita inflow of asylum-seekers ever recorded in an OECD country (Emilsson, 2018). Hagelund writes about this as an 'exogenous shock' (Hagelund, 2020, p. 1). At that time, Sweden had quite an open migration policy and an integration policy based on a multicultural approach (Borevi, 2012). These former policies are, however, currently contested and have changed since 2015, raising the question whether this signals the end of what has been called the Swedish exceptionalism to migration and the opening of doors to refugees (Dahlstedt & Nergaard, 2016; Kenes, 2020; Rydgren & van der Meiden, 2016).

Was this a 'crisis' or even an 'emergency'? That question has been debated in Sweden, and the discourse of crisis is used not least by populist right-wing parties campaigning on strong anti-immigrant and anti-refugee platforms. What can be considered problematic is the fact that the extreme right-wing is no longer found only in the civil sector in Sweden and Europe, but it has conquered political parliament too, as shown by the success of 'National Front' in France, 'Golden Dawn' in Greece, 'Jobbik' in Hungary, 'Alternative for Germany', 'Freedom parties of Austria' and 'Sweden Democrats' in Sweden (Djorić, 2016). Accordingly, Sweden has experienced an intense debate on migration and several new laws have been passed to restrict migration (Garvik & Valenta, 2021). The number of asylum seekers in Sweden decreased soon during the late autumn 2015. This was mainly caused by a reverse in Sweden's' asylum policy by tighter border controls, both between Turkey and Greece and within Europe, which reduced Sweden's intake of refugee to the EU-mandate minimum.

From a comparative perspective Sweden was certainly not in a state of 'emergency'. The 'newly arrived' children and youth in migration into Sweden in 2015 did not lack access to national and community education systems and the society was not overburdened or on the verge of a 'system breakdown' (see Scarpa & Schierup, 2018).

Migration and the Swedish context

Sweden has experienced waves of migration since the end of World War II, and children and youth have arrived as asylum seekers, children to labour migrants and for family reunification since long back, although not in such large numbers as in 2015. Currently, the most common

country of birth for foreign-born people is Syria, followed by Iraq. Migration from the Horn of Africa is also quite extensive where Somalis are the largest group from Africa living in Sweden (in 2018 there were more than 100 000 Somali people living in the country (scb.se[vii]). Statistics show that during the 2019/2020, six per cent were 'newly arrived' pupils in Swedish compulsory school (The National Board of Education, 2020).

Sweden used to be described as one of the Nordic welfare states and it enjoyed an international reputation for combining generous welfare state entitlements with rapid economic growth, low unemployment, and high levels of labour force participation, particularly among women. This welfare model, characterized by generous, non-tested benefits, a strong element of redistribution in the systems and high taxes, was developed after WW-II, but had ideological roots in the labour movement of the late 1800s (Esping-Anderson, 1990; von Brömssen et al., 2022). One example of the welfare model is that Sweden offers free education from age six to 19 and free school lunches for all children in compulsory schooling, which covers the age range between six and 16 in Sweden. Over the last 20 years, the welfare model has been challenged due to Europeanisation, globalization, technology changes and an increase in international financial competition (Greve, 2007, p. 44; OECD, 2010), which leads inter alia to challenges concerning social inequalities (Kvist et al., 2011).

Education, the European Union, and the Swedish Welfare State

A large body of research shows that education plays a significant role in health and wellbeing, as well as in integration in the 'new society', and education has been identified as one of the most important institutions for newly arrived migrant children (Anderson et al., 2004; Hek, 2005; Morland & Birman, 2016; Rutter, 2006; Svensson, 2017; Svensson & Eastmond, 2013). This is in line with one of the focus topics for the European Union. The Union states that, 'All citizens in the EU have the right to high-quality and inclusive education, training and lifelong learning'. Therefore, the European Commission has formed an action plan to integrate 'third-country nationals' and has identified three priorities for education: to integrate newly arrived migrants into mainstream education structures as early as possible, to prevent underachievement among migrants, and to tackle social exclusion and foster intercultural dialogue.[viii] The educational systems in Europe all have different reception systems in place, although these systems differ in many ways (Crul et al., 2019).

Newly arrived students and the Swedish reception system

There are special challenges with the education of newly immigrated students. A large body of research points to the need for appropriate measures on the transition to host countries' education systems (Anderson at al., 2004; Çelikaksoy & Wadensjö, 2022; Bunar, 2015; Nilsson & Bunar, 2016; Pinson & Arnot, 2020; Rutter, 2006; Tajic & Bunar, 2020). Hek (2005) argued that:

> *It is no exaggeration to say that refugee children's well-being depends to a major degree on their school experiences, successes, and failures. Because they are*

> *unfamiliar with the education system and particularly when they do not speak English; parents cannot help their children as they would wish to, and children may be left to deal with difficulties alone (p. 29).*

It is likewise important to remember that refugee children are not a homogenous group and have a range of different needs experiences and expectations (Hek, 2005). There is a tendency to create 'a simple universal idea' of refugees, and who they 'are' (Loizos, 2002, p. 42). Papadopoulos, among others, underlined that a 'loss of home is the only condition that all refugees share' (2002, p. 9; 'see Hek, 2005, p. 15).

The rules and regulations concerning education in Sweden are decided at a national level and it is the municipalities that have the concrete responsibility for organising education for all children between 7 and 16 years of age. All children registered in a municipality are subject to compulsory school attendance, regardless of their legal status. Core values promoted in the Swedish national policy documents are equivalent and equitable education for all students. Moreover, education should be adapted to each student's needs, based on the student's background, earlier experiences, language and knowledge, irrespective of where in the country it is provided (Education Act, 2010:800). This is explained as follows:

> *The education in the school system aims for children and students to acquire and develop knowledge and values. It should promote the development and learning of all children and pupils as well as a lifelong desire to learn. The education must also convey and anchor respect for human rights and the fundamental democratic values on which Swedish society rests. (p. 4)*

The following quote conveys the core values in the Swedish national curriculum:

> *Education must be designed in accordance with fundamental democratic values and human rights, such as the inviolability of human life, the freedom and integrity of the individual, the equal value of all human beings, equality and solidarity between people. (Education Act, 2010, p.5).*

The equivalence in the Swedish school is currently challenged and increasing differences in results are noted between groups of students with different cultural and economic assets in society (Cerna et al., 2019; Löfstedt, 2019). The differences between schools' results have increased for several years and the National Agency for Education (2015) concludes that the increasing differences in results between schools are due to an increased sorting of pupils in different schools – that is, increased school segregation – which means that students with different backgrounds meet increasingly infrequently (Böhlmark, Holmlund & Lindahl, 2015).

As mentioned above, the municipality is responsible for the reception of newly arrived students and the municipalities' experiences of receiving new arrivals vary greatly in Sweden. Sometimes the teachers have extensive experience and strategies for this kind of work, but not always.

Therefore, the teaching of newly arrived students sometimes rests on staff who do not have a firm foothold in the specific school and without knowledge about how to work with students with a recent migration history (Korp et. al., 2019).

In 2016, a new set of legislative changes from the Government was adopted concerning newly arrived students (Government Bill 2014/15: 45; SKOLFS 2016:2). This new legislation stated that the knowledge of a newly arrived student must be assessed, and the result should be included in the basis for a decision on placement in grade and teaching group, for how the teaching should be planned and how the time should be distributed between the subjects (The National Board of Education, 2016). The assessment consists of three subsequent steps: (a) gathering basic information on a student's background, experiences, the language(s) spoken, number of years in formal or informal education; (b) the attained level of knowledge in numeracy and literacy according to age; and (c) the attained level of knowledge in academic subjects. The results are stored in a student's personal file, which teachers can access when they plan teaching activities (Tajic & Bunar, 2020). Moreover, a newly arrived student must, within two months of his or her arrival in Sweden, be placed in a grade that is appropriate to his or her age, prior knowledge, and personal circumstances in general. It is also stated that a newly arrived student who lacks sufficient knowledge of the Swedish language to be able to follow the regular teaching must be partly taught in a preparatory class. The headmaster is responsible for organizing the reception of newly arrived students based on what is judged to work best for teaching and the ability to offer newly arrived students a well-functioning introduction to the education in the Swedish school. New students are sometimes placed directly in a regular teaching group. It is also common for students to be placed in some form of preparatory class. The teaching in a preparatory class in a certain subject should be interrupted for the newly arrived student as soon as the student is judged to have sufficient knowledge to be able to participate in the regular teaching of the subject. The teaching in a preparatory class for the newly arrived student shall not last longer than two years and a student is not regarded as a newly arrived student after four years (Government Bill 2014/15: 45; 'see Bunar, 2017, pp. 3–6).

The research project for this article

This article builds on the results of a research project investigating reception strategies and inclusion for newly arrived students in schools in two municipalities in Sweden and included both quantitative and qualitative data. The research also included the migrant students' own reflections on these issues. The research was carried out from 2016–2018.[ix] We decided in cooperation with the operational managers of the reception units in both municipalities to focus on students of middle and high school age (approx. 11-15 years). It was done because 1) students starting Swedish primary school after primary school age, have more difficulty to achieve the same knowledge results as peers and therefore the issue of equivalence is more critical in middle and upper secondary school 2) the older students can more easily formulate and reflect on different

aspects of their educational situation. The case studies in the schools are based on lesson observations and on interviews with newly arrived students, with teachers, study tutors, special educators, social pedagogues, and other staff who work with newly arrived students in school and teaching, as well as with headmasters of the selected schools (Korp et al., 2019, 23-24).

In this article we focus on two teaching and learning situations in Swedish classrooms where newly arrived students are included and take part. These aspects are a) framing of the day and the lesson and b) study tutoring in mother tongue in regular teaching. The newly arrived students are part of larger groups of students with a migration background, with varied cultural and language backgrounds and length of stay in Sweden. This makes the teaching situation challenging in order to 'adapt education to each student's needs, based on the student's background, earlier experiences, language and knowledge, irrespective of where in the country it is provided', as stated in the Swedish Education Act (2010:800).

Methods and material

The part of the study presented in this article is based on ethnographic work and interviews from eight primary school units with different conditions and ways of organizing teaching for newly arrived migrant children (Korp et al., 2019). In our research for the whole project, we interviewed students and their guardians, followed handover conversations from teachers in the reception unit to regular class teachers, made lesson observations and follow-up calls. The selection of students was made in consultation with the head of the school units and teachers at the reception unit in each municipality. Thus, students from both middle and high school are included, the gender distribution is quite even, and neither the students themselves nor their guardians suffer from mental illness or particularly difficult life circumstances. We also had access to an interpreter in the current language if needed. However, the recruitment of students for this part was complicated as the students were in the reception unit for a short time, difficulties in getting interpreters, the school placement came often too close to the start of regular school and of students moving across municipal borders. Five students from the same number of school units were added in this way, but to slightly different degrees depending on the circumstances. At the other schools, we followed a group of students. An interpreter was used in most of the interviews. The observations were documented through field notes and the interviews were recorded and transcribed. On the next page is a table of collected material at the schools throughout the research project (Krop et al., 2019).

Analysis

The data were analysed step by step through open qualitative thematic analysis with the aim of finding overarching discursive themes (Braun & Clarke, 2006; Schreier, 2014). The interviews and fieldnotes were coded and text segments were inductively developed into categories and patterns of similarities and differences out from the two lenses for this article, namely 'Framing of the day and the lesson' and 'Study tutoring in the mother tongue in regular teaching' which

were two overarching themes that we identified and found interesting across our data set. We work based on a social constructionist epistemology where events, meanings, and experiences are seen as articulated out from existing discourses in society (Burr, 1995). In line with such an epistemology, we seek to theorize the sociocultural contexts and structural conditions that make the individual provided accounts possible.

Following Braun and Clarke (2006) we went through the six phases of analysis, moving back and forth in our data throughout the working process. The process of coding meant that we organised data into meaningful groups, thereafter, sorting the different codes into potential themes. For the first theme 'Framing of the day and the lesson' the organised coding included the data groups: starting the lesson, teacher interaction, teacher planning, working methods, language use, language approach and content. For the second theme 'Study tutoring in the mother tongue in regular teaching' the coded groups were: working tasks, role, motivation for work, problems, language approach and cooperation. The identified themes were then put into a context of earlier research findings on 'emergency education' and teaching 'newly arrived students'.

Table 1

The study's data

	School 1	School 2	School 3	School 4	School 5	School 6	School 7	School 8	Total
Student interviewees	5	2	4	2	6	2	2	4	27
Teacher interviewees	2	3	5	2	3	3	2	5	25
Study tutor interviewees	5	3	1	1	3	2			15
Headmaster interviewees	1	1	2	1	1		2	1	9
Other interviewees	1 parent, 1 head	1 parent	1 coordinator		1 teacher* 1 reception staff	2 parents	2 teachers*	1 parent, 1 mentor	12
Participatory observation days	6	4	6	4	6	6	2	6	40

* *Special education teachers*

Ethics

According to Swedish law concerning ethical conduct code (SFS 2003:460), participation in a research study is voluntary, confidential, must be approved by parents if the participants are underage, and participants are free to withdraw at any time without giving a reason. Children, teachers, and parents in this study were informed of this and all gave their consent. Newly arrived students and their guardians have received written information in their mother tongue and provided written consent to participate in the study. The research proposal went through ethical

review by the regional Ethical Committee. We have engaged in the research in line with the formal regulations and have tried to act in a respectful and dialogical way in order to continue to maintain public trust and confidence in human research (Good Research Practice, 2017; Korp et al., 2019).

Newly arrived students learning situations in education

This part of our article deals with two different cases or situations in the project, showing the great challenges in the Swedish school system in education, both for newly arrived students and their teachers. The first case highlights the students' opportunities for learning different subjects and how students are affected by the teaching structure and content, and by, for example, working methods, framing, and the teacher's ability to work with an approach to language that contributes to students' language development.

Framing the day and the lesson

In most of the classrooms we studied, the teachers went through and informed students about the day's layout and content before the lesson started. Times and content for the lessons were clearly noted on the board by the time the students arrived at the classroom to give a clear picture of what would take place during the lesson and the day. At one of the schools, lessons and the breaks were symbolized by images that are plasticized and attached in chronological order within a box of red tape on the board at the front of the classroom.

The lessons were also framed in a similar way. The teachers wrote down the workflow on the board while they explained which area they were going to work with, what the students should learn, and what tasks or elements the lesson would contain. Sometimes the planning was available digitally and displayed with the projector. A lesson usually contains several elements of different nature, such as tasks or activities to be done jointly/in group/individually; oral and written assignments; moments where students listen or see a card of film, and where they themselves are active in, such as writing, presenting, or solving problems. Another common feature of the teachers who worked with a clear framework was that they spent a short time on the overall planning but introduced various steps and tasks in more detail as they moved forward in the planning. They checked that the students had understood the various steps and tasks before proceeding and explained more if needed. It is clear that these teachers are well prepared and have thought through teaching and the students' different conditions for taking part in the teaching carefully (Korp et al., 2019). Below we give examples and analyses of interactions in the classroom that show careful moves in education out from a clear framework planned by the teacher.

Example A

The students enter the classroom gradually and sit down at their own places, take out their books, and chat quietly with each other while waiting for the lesson to begin. The teacher greets everyone with a nod and a smile, and a few words – 'Are you feeling well now?' 'Did it go well yesterday?' We present an excerpt from our field notes as follows:

Like every morning, she (the teacher) begins by showing the time planning/schedule, which she had written down on the board before the students entered the hall. Then she goes into what is new or special:

- In social science today, we will start with a completely new area, and I think that you will find it very exciting. We're done with the history part now and we are going to start with geography, and we are going to talk about population distribution in the world, where people live and why there are so many people living in some places, and almost none in others. We'll talk about that. Then in the arts we will start with something I know that you think is great fun – clay! We have bought lovely new clay we will put our hands into and shape. [The students are very happy about this, jump a little on the chairs and shouts 'yeah!]

- And then we will have to burn the things you have done in a very hot oven, so that they become durable. But first the objects that we have made have to stand and dry for a few weeks in the classroom. Yes, it is going to be a lot of fun!'

-Tomorrow, dear friends, is a special day at school – does anyone know? There have been posters at school … [one boy knows; it is International Reading Day].

- Well, now we start the lesson! We will work with oral presentations today, and you should get to talk together first and make one common mind map, and then you will get to watch a small film. I will not say what it's about yet!

The teacher writes on the board:
- Oral presentations
- Mind map
- Film
(From field notes, Korp et al., 2019, p.66).

Javed, a newly arrived student in the class, says in an interview later that he values the clear framing and teacher's approach:

I think the X-school has been the best because I just feel that here, I am learning more … It's the teachers, they're really trying to teach us, they are kind and say what we need to improve. But at the same time, you have to take responsibility for what you have to learn! … They are clear, show what you should do, say if you should do this and then you should do that. They have planning. (Interview, student, Korp et al., 2019, pp. 66–67).

Javed came to Sweden almost four years ago and attended several different schools. His favourite school is the one he attends now.

The teachers framing of the lesson by presenting a clear plan is something we have seen in most classrooms, but it in many cases additional reinforcing structures are needed if that lesson content should be available to newly arrived students. The teacher in the example above speaks clearly, with well-chosen words and a sense of what words are new and difficult for some students. Overall, teachers make eye contact with the students and are alert to signals that they do not understand. They listen to the students and convey that learning takes place in a social context, where both the teacher and other students contribute and help each other (Korp et al., 2019). Research shows that inside the classroom it is important that the teacher creates a positive learning environment that strengthens newly arrived students' self-esteem and confidence in their own abilities. Therefore, the teaching needs to be well planned so that students with different language backgrounds are given the opportunity to use their previous language skills when learning (Cummins, 2001). We also claim that structured social interaction between teachers and students enables students to understand a new social context as well as an opportunity to learn.

Example B

In other classrooms, it is much harder for the newly arrived students to understand what the lesson is about and what is expected of them. The example below is taken from a lesson at a school where the teacher does not adapt the teaching to newly arrived students who have different abilities in their second language development, which is Swedish.

> *The teacher comes into the classroom like the rest of the students. It's pretty quiet when the students enter. The five newly arrived students [who are also the only ones in the class who have a migration background] sit at the back of the classroom, and behind them are one Arabic-speaking and one Somali-speaking study tutor. The teacher greets the students when they have sat down, and asks how it has been today, have they been able to stay calm and do what they are supposed to do, focus on the tasks and do not talk about anything else that might interfere with the lessons.*

He/she says the lesson today will be about the car and points to a plan that he/she has written on the board:

- *Development of the car*
- *Internal combustion engine*
- *The car and society*

> *The teacher also mentions that the students have homework to read by tomorrow, pp. 5–9 in the book and the stencil about the engine. He/she speaks quickly and doesn't repeat or pay attention to subject words and concepts that may be new to the students. The newly arrived students who have been in Sweden for 1.5–3 years (two boys with Arabic as mother tongue and two with Somali) look attentive, but the two girls (Jasmin and Houda), who have been shorter time in Sweden (Jasmine only a couple of months)*

seem sleepy and to be thinking about other things. The teacher does nothing to check if they understand the content of the lesson.

The study tutors stand silently behind 'their' students throughout the lesson.

The Arabic-speaking study tutor is busy with his mobile phone (perhaps he is researching concepts he does not understand). He/she has been a short time in Sweden and is studying SFI. He/she sometimes bends forward and whispers a few short words to the girls.

The teacher shows a film about technology/transport history, which spans 250 years. The narrator speaks quickly and, in addition to a variety of historical and technical terms, uses many abstract and metaphorical expressions. Most students seem to be watching and listening to the movie. However, Jasmine soon puts her head in her arms. Houda looks at an Arabic TV series on her own computer.

When the film is over, the teacher turns on the light and says (to everyone), 'Time to wake up!' He/she begins to summarize the main features of the film by asking questions to the class: Who invented the steam engine? How could it be that the car suddenly became so common? What was invented that made it possible to start manufacturing everything much faster and cheaper? He/she does not explain any of the concepts or expressions that have appeared in the film and can be difficult, especially for the newly arrived students, to understand. Only four or five boys raise their hand and answer the questions. Of the newly arrived students, it is Mahmoud who participates, and he answers one question. The teacher confirms the answers, and reflects on them at a fast pace, asks new questions, points to connections and asks, for example, what driving forces are behind the technology development, and how technology development in an area can lead up to development in completely different sectors and in society as a whole. (Field notes, Korp et al., 2019, pp. 67–68)

The teacher him/herself believes that it is a dilemma how to work to include the newly arrived students in the subject. He/she says that he/she has chosen to put them together in the classroom so that they can discuss and get help from each other and get close to the study tutor, too. Of the newly arrived students, he says:

In the name of honesty, they do not get a lot out of the subject knowledge, because they know so little Swedish yet. But they are included in the class, and they hear the Swedish language around them all the time. But of course, there is a feeling that you are not doing enough for the newly arrived students, and the teaching materials in technology are unfortunately not recorded yet' (into different languages). (Fieldnotes in connection to the lesson, Korp et al., 2019, p. 69).

In this lesson it is clearly shown how difficult many teaching situations are for newly arrived student when teaching isn't thought through. We certainly do not want to put blame on teachers and enter upon 'teacher bashing'. Yet, we see a great need for continuing teacher training on how to cope with situations as the one discussed above. This is also noted by teachers themselves. In an investigation by one of the teacher unions it is stated that 70 percent of the teachers do not consider themselves to have sufficient competence to teach newly arrived students (Skolvärlden, 2016).

Mother tongue tutoring

In Sweden, it is the school's task to organize the teaching for students with another mother tongue so that they are given the conditions to develop knowledge in all the school's subjects at the same time as they learn the Swedish language (The National Board of Education, 2022a). A way to satisfy this need is to continually tutor the students in their mother tongue. How the teaching for newly arrived students should be designed, which subject teaching in the regular teaching group they can participate in, and to what extent this can take place is decided based on the assessment of the individual student and decided by the school headmaster as stated above (Education Act 2010:800; The Swedish National Board of Education, 2019). Preparatory classes are one possible way to give the newly arrived students the skills they need to be able to participate in regular classes. When the school after some time assesses that the student can follow the regular teaching in the subject, the student should leave the teaching in the preparatory class and, in all cases, studying in a preparatory class should be no more than two years (Educational Act 2010: 800, Chapter 3; Tajic & Bunar, 2020). The purpose of this legislation is to avoid the reported existence of students being 'stuck' in preparatory classes for extended time, and often experiencing them as spaces for 'othering' and marginalization (e.g. Brännström, 2021; Korp et al. 2019; Folke, 2017; Skowronski, 2013; Dávila, 2017).

Study tutoring in regular teaching

Another way of supporting newly arrived students in education is study tutoring in the mother tongue in the regular teaching (The National Board of Education, 2022b). Tutoring in the mother tongue during the regular class teaching is a teaching support that may be given to students with another mother tongue than Swedish. This means that bilingual staff support students in acquiring subject knowledge in their mother tongue (Avery, 2017; Bunar, 2022; Straszer et al., 2019). The purpose of this initiative is to develop, with the help of the mother tongue or the strongest school language, the subject knowledge of the students in parallel with the development of the language. According to the Official Report of the Swedish Government (SOU 2017), this is the most important effort to develop the newly arrived students' knowledge development and to increase their goal fulfilment (Cummins 2000, 2017; Thomas & Collier,1997). The tutoring can be conducted in different ways; by a multilingual teacher, or by a teacher together with a study tutor who masters the student's mother tongue or the student's strongest school language (The National

Board of Education, 2019). Study tutoring can take place before, during or after the regular lesson. Regardless of which variant is chosen, it is important that the study tutoring begin from the students' needs. Also, the cooperation of the regular teacher and the study tutor is seen as being of great importance for teaching (Sheikhi & Uçar, 2017). The subject teacher needs to understand that the study tutoring is not the same as subject teaching, and that the study tutor must be able to explain the workflow at the same time as he/she explains the subject content (Glogic & Holm, 2017). Currently, the headmaster at the school determines how the study tutoring shall be organized and there is no limit to how long and to what extent a newly arrived student may be entitled to tutoring – this should be governed by the student's needs (The Education Act, 2010: 800, Chapter 3). Research holds that study tutoring in regular teaching is crucial for the student's inclusion and school success (Axelsson, 2015; Cummins 2000, 2017; Thomas & Collier, 1997) even though there are no scientifically reliable researches confirming how participation in study tutoring influences the student's results. We also know from research that access to tutoring varies between municipalities and schools but far from all new arrivals receive the support (Bunar, 2022; Lainio, 2012).

In the following, and as our case two, we want to highlight study tutoring in mother tongue in regular teaching as an interesting function in the reception of newly arrived students. We do this through three examples. Through our classroom observations and in interviews with study tutors and teachers, it emerges that tutoring in the mother tongue is a complex task that varies based on the study tutors' own qualifications and view of the assignment and how the study tutor is positioned in the school. Our research shows that there exist different views on what the assignment as a study tutor implies; namely, as educator and knowledge mediator, as language and cultural interpreter and as a study tutor also having a 'caring' task. Below, we explore the three main ways of interpreting the assignment of working as a study tutor for newly arrived students. We do this through analyses of interviews with three different study tutors (Korp et al., 2019; Risenfors et al., 2018).

Example 1 – Sumaya: educator and knowledge mediator

Some of the study tutors, like Sumaya, have a pedagogical education, although not a Swedish teacher's degree, and she highlighted especially the pedagogical task in the interviews. Sumaya stated:

> *Sumaya: There are more math teachers, but not many that can speak Dari (language spoken in Afghanistan) so I'm making a big effort right now. I can help students into Swedish school.*
>
> *Interviewer: But you get a much more inconvenient job?!*
>
> *Sumaya: Yes, I travel many miles back and forth every day and work in 10 schools, but it is important to have study tutors who are also trained teachers. I think I can*

> *motivate in math and such subjects early. Right now, I am probably doing the best as a mother tongue teacher and study tutor.*

But it is not only trained teachers who see the role of a study tutor as primarily pedagogical. Amin, who had no professional experience at all when he started working as a study tutor said: 'I visit the Swedish National Agency for Education's website almost every day and learn a lot about teaching and pedagogy. That is my mission'. In the role of educator and knowledge communicator, the study tutor talked about the importance of working together with class and subject teachers, something that also appears in class teachers' stories as follows:

> *I think it was Halima's first week. She would join the group and present a country in Europe. And she was there and did it already the first week. […] She did it in Swedish words with a lot of help from the study tutor. They sat at home with Google Drive and worked on a shared document. She and the study tutor sat late one evening and wrote [laughs] because she wanted so much. Yes, so she stood there and could not speak many Swedish words. But she did it. (Interview with the class teacher, see Korp et al. 2019, p. 70).*

The above quote illustrates how the student's willingness to participate is encouraged and supported by both the teacher and the study tutor, who show great commitment to enable the newly arrived student to successfully participate in the teaching and take a place in the group.

Example 2 – Hossein: language and cultural interpreter

The other task that the study tutor took up is to 'school' or socialize the new arrivals in a careful way in the Swedish school system. Many students come from school systems that are very different from the Swedish one and it takes time to understand what is expected in Swedish schools (BRIS report 2018). This is highlighted by many researchers and for example Huitfeldt (2015) underlined this from examples in the subject 'Physical Education and Health' in Swedish schools. The importance of students' previous experiences and growing up conditions means a lot for their self-confidence and attitude towards school, where notions of gender, economics, and religion, for example, might play a role different from in Sweden. One aspect of this is teaching students to take responsibility for their studies and not just trusting the teacher, Hossein underlined. But he also said, 'It is difficult, because the teachers in Sweden have nothing to object to when the students do not obey, and the new arrivals can think, 'Here it is luxury like … you do not have to work'. Hossein sometimes gets angry when he sees how students behave and says: 'Sometimes I boil inside me and shout: Hello! What are you doing? You must respect all teachers, so, get it together!'

The study tutors, as Hossein described, are also language and cultural bridges for what they call 'the Swedish students'.

> *I must point out that all students in classes must understand who the newcomers are. They just think [the Swedish students] that they come from the desert and have never been to school. They're just being bullied. The students say, 'We do not want to work with him/her because he/she does not understand anything (of the Swedish language) but, they, he/she [newcomer] understands! It's just that it's the language that hinders them.*

The quote above shows how marginalization of the newly arrived can take place and the challenges put on schools and teachers to handle many complex situations. Therefore, the role of study tutors is underlined as important for all students, not only for the newly arrived students.

Several of the study tutors discussed their role as 'cultural bridges' between students, they emphasized the dilemma between being inside the classroom, on one hand, and being a cultural bridge for all students, on the other. Sometimes they have to teach newly arrived students separately about concepts or how the Swedish society works.

Example 3 – Salma: Study tutor and 'caring'

A third area that appears in the study tutors' stories is that the students often turn to them when they need security and comfort. Gay (2010) described this task as 'caring'; that is, taking care of the students, their emotions, and potential problems. Many of the newly arrived students have experiences with war, violence and dramatic experiences and they often turn to the study tutors. Salma in this excerpt expressed that she wants to help and comfort, but also that this can be difficult.

> *Salma: I want to help them, especially the newcomers. They have been hit by war and they need help. I like it. I joke with them, and I speak the same language.*
>
> *Interviewer: Many have been through difficult things. Can you take care of that?*
>
> *Salma: Yes, I have had to leave (the classroom) because I have cried and felt that I could not bear it. I come from a country that has been at war and I recognize, and in the end, I feel that I cannot take it anymore.*
>
> *Interviewer: How do you cope?*
>
> *Salma: I cannot bear it. Sometimes it feels like I cannot talk to parents and especially not with the legal guardian,[x] because that is when the parents are left in the home country. It is really difficult.*

Another issue related to the 'caring role' is about being torn between having moral responsibility for a student and still not having the right mandate for this, as Iman discussed.

> *I am the one who is in contact with guardians, and I am an assistant mentor (study tutor). It's a lot of work, and a study tutor should not really be an assistant mentor. The problem is that I take care of the students but at the same time I am not the main*

> *person responsible for them. And there are conflicts with the teachers sometimes. The teachers do not know the students and want us to help because we know them from the preparation group, but at the same time we are not real mentors. (Interview with Iman, study tutor).*

It is not uncommon for the study tutors to be given a mentoring role without the task being in their duty, and it may even happen that the students 'fall between the cracks' so that in practice they do not get a mentor at all. One of the teachers believed that mentoring is the role of the study tutor because the teacher himself does not know the student well enough. The study tutor, on the other hand, said that she had not been assigned an official mentoring role and sighed: 'Often the study tutors may be unofficial mentors' without either a mandate or salary for it.

Conclusion

This article deals with what can be framed as emergency education, education for newly arrived students in compulsory education in Sweden, one of the five Nordic welfare states. The study investigates reception strategies and inclusion for newly arrived students in schools in two municipalities in Sweden, as well as the migrant students' own reflections on these issues (Korp et al., 2019).

The year 2015 was a year of unprecedented migration, particularly from the Middle East to Europe. Sweden received almost 163,000 asylum applications and this situation challenged the Swedish school system and teachers on how to organize and prepare for teaching and learning in a new situation for many schools and teachers even though Sweden has been a country that has received migrants since long back, especially after the WW-II. Thus, the situation of receiving migrants were not new, but experiences and knowledge of working with migrant students varies widely between regions, schools and among teachers.

During this year, 2015, Europe witnessed initially a mobilisation of solidarity and demands for a humane response articulated by government officials as well as voices in the media. The government responses then changed quite rapidly and were replaced by a discourse of 'crisis' and after the autumn peak in late 2015, the borders were more or less closed due to new restricted Swedish migration laws. Fewer refugees have arrived and it has become more difficult to get the right to stay in Sweden (Çelikaksoy & Wadensjö, 2022).

A new set of legislative changes from the Swedish Government was adopted in 2016 concerning newly arrived students and education (Government Bill 2014/15; SKOLFS 2016). The new directives included an obligatory and individual assessment or 'mapping' of newly arrived students to elucidate the students' language and experiences, literacy, numeracy, and the students' knowledge in different school subjects. This was done to be able to place the students in the right grade and teaching group.

We have in this article discussed how the Swedish school system and teachers reacted and tried to deal with the situation of trying to accommodate and possibly integrate many newly arrived students with a very recent migration history in school. We have done this through two different cases; one case exploring how teachers develop a strategy of 'framing the day and the lesson' through clear information and explanations on what will happen during each lesson and the whole day. This gives the students a clear view of how the day is organized, what they are expected to do and thus provides security for the students. As Swedish is the majority language in Sweden, teachers use pictures and several other devices to help the students to understand the Swedish language. They clearly care about the students and stop and ask, explain words and concepts. Teachers listen to the students and make sure that learning takes place in an environment where both the teacher and other students contribute and help each other. This situation is however not the case in all classrooms as we have shown from another teaching situation where the teacher does nothing language wise to check if the newly arrived students understand the content of the lesson. Here we want to emphasise that we do not want to contribute to 'teacher bashing' or point a finger towards the teacher. Teaching is a challenging activity and to become a knowledgeable and well-functioning teacher, supporting structures must be in place. Especially an approach to language and multilingualism where teaching focuses on active and authentic language use and where the formal aspects of the language are gradually integrated, are important. In one of the examples we have described, the teacher did not know how to cooperate with the students or how to support students' language development. Also, the caring and empathy aspects seemed to be missing.

In our case number two, we describe and discuss the work that are performed by the mother tongue study tutors in regular teaching. Study tutoring in the mother tongue is seen as an important part of the school's pedagogical work and can help multilingual students to succeed in school (Avery, 2017). We show in our study how different the mother tongue tutors view their work assignment. This kind of employment is also very vaguely described in regulations, and education and training for study tutors are almost non-existent. Also, as stated earlier by Avery (2017) tutoring does not function in the way it is envisaged in the national steering documents. There is a lack of time for joint planning and there are no teaching materials suitable for tutoring in the mother tongue or time to develop. This is something we also identified in our research.

As pointed out by Tajic and Bunar (2020) the Swedish legislation concerning newly arrived students with a migration biography, a wide range of adopted measures could be, in international comparison considered as advanced and, in many parts, in accordance with research recommendations (Crul et al., 2019). Stating this, we can conclude that there is still a lot to be done to create an education for newly arrived students that responds to their needs and that also takes care and develops resources that the newly arrived students bring with them. We argue in line with Bhabha (2019) referenced earlier in this article, that we cannot continue to fail young

people with quality education. We think teacher education in all parts of the world needs to respond and prepare teachers to the relevant contexts. In this article we have shown how multicultural and multilingual identities in classrooms have great impact upon and challenge traditional and ingrained ideas about teaching. Teaching is a complex work activity, not least in today's globalized world where migration is a natural part of almost each nation and will presumably continue to be so also in the future. Accordingly, all nations need to 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities *for all* (our italics) as stated in the UN Sustainable Development Goal 4. We are just a bit on the way.

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Authors Note:

i. *The terms 'refugee' and 'asylum-seeker' have specific legal meanings. An asylum seeker is a person who has crossed an international border in search of safety and applies to be given refugee status under the 1951 UN Convention. A refugee is someone who has gained refugee status under the 1951 UN convention relating to the status of refugees.*

ii. *https://www.scb.se/hitta-statistik/sverige-i-siffror/manniskorna-i-sverige/utrikes-fodda/ [2022-04-10].*

iii. *This research was performed within the project 'Kartläggning av nyanlända elevers utbildningssituation och övergångar i grundskolan' (KAN) and has been published in Swedish in the report Inkludering och likvärdighet för nyanlända elever i grundskolan - en fallstudie i två kommuner [Inclusion and equivalence for newly arrived pupils in compulsory school – a case study in two municipalities] written by H. Korp, K. von Brömssen, K. Kittelmann Flensner & S. Risenfors (2019). Published online: https://www.researchgate.net/publication/333702770_Inkludering_och_likvardighet_for_nyanlanda_elever_i_grundskolan_-en_fallstudie_i_tva_kommuner [Retrieved 2022-06-29]. [In Swedish].*

iv. *Merriam Webster: https://www.merriam-webster.com/dictionary/emergency [Retrieved 2022-06-25].*

v. *https://www.scb.se/hitta-statistik/statistik-efter bamne/befolkning/befolkningsframskrivningar/befolkningsframskrivningar/pong/tabell-och-diagram/invandring-och-utvandring-efter-kon-och-fodelseland-samt-framskrivning/ [2022-07-04].*

vi. *https://ec.europa.eu/eurostat/databrowser/view/migr_asyappctza/default/table?lang=en [2022-04-13].*

vii. *https://www.scb.se/hitta-statistik/sverige-i-siffror/manniskorna-i-sverige/utlandska-medborgare-i-sverige/ [2022-06-04].*

viii. *https://education.ec.europa.eu/about-eea/working-groups [2022-04-11].*

ix. *Children who come to Sweden without parents ('unaccompanied refugee children') must, according to Swedish law, be assigned a legal guardian.*

Staff Complaint Reasons and Handling Mechanisms: Sebeta Town Administration Education Office in Focus, Oromia Regional State, Ethiopia

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Abstract

The objective of this paper was to investigate the nature of staff complaints in Sebeta town education office. The study also assessed the reasons for complaints and examined ways of handling the complaints. In the research, case study research design was used. Data were collected through semi- structured interview guide from four team leaders, four staff members as well as three discipline committee members working in the education office. The respondents were selected purposefully. Based on the research findings, complaints in the office have emanated from the manner the organization is structured with regard to departments and human power, the way of doing things (stringency and unfairness), individual differences, and the challenges from the management. Though the management was open to deal with the complaints from the staff, some of the most common complaints by employees were low pay and benefits, unfair and frequently changing organizational structure, absences of promotion, and high work load. Most employees believe that their concerns cannot be solved at office level. Despite the availability of formal committee at office level to deal with grievance from the employees, nearly all complaints fail to pass through this formal channel.

Keywords: Complaint; Complaint handling; Conflict

Background

Educational institutions are established to accomplish educational goals. The teaching and learning process that takes place in these organizations is complex and can be influenced by external factors. This makes managing educational institutions not easy. Education offices are among the institutions responsible for managing the schools under their supervision. To this end, they make use of different types of resources, of which human resources or staff members are the major ones. Education offices are organizations that have an administrative officer (district education office head), who is responsible for the overall functioning of the office.

While organizations are dealing with human resources/staff members, individuals in the organizations can have their own ambitions, styles and interests and be able to act differently. These differences between individuals might create conflict of interest among employees themselves as well as between employees and the management. Because of absurd organizational rules and regulations and related law pay, employees in an organization often complain and get dissatisfied about their work or interpersonal relationship; and these are of the reasons for employees' grievance and result in weak commitment (Brewer& Lam, 2009).

In education offices, unless major causes for complaints are detected and addressed, it affects the functions of schools that are supervised by the office and then students' academic achievements may possibly be hampered. Quality education can be hampered because of poor grievance

handling mechanism in educational organizations (Kumar, 2013; Sharma, 2015). Educational organizations are supposed to put into practice a clear-cut, effective structure for complaints management; "a good complaint management system will help reduce or prevent future occurrences of complaints" (Nwagbara, 2011, p.14).

Though the term complaint can be casual and presented in written or oral forms, grievance refers to a formal complaint by an employee. Therefore, complaint and grievance in this study are used interchangeably.

A complaint can be defined as any work-related dispute arising out of the interpretation, application, administration or alleged violation of the specific terms of the collective agreement (Danku et al., 2015). According to Ombudsman Western Australia, a complaint is an "expression of dissatisfaction made to or about an organization, related to its products, services, staff or the handling of a complaint, where a response or resolution is explicitly or implicitly expected or legally required" (2017, p.1). Complaints can be any issue raised by staff members that help in facilitating organizational goal achievement and to be addressed by the management.

Grievance is basically a complaint raised by an employee to fulfil his aspiration and expectations by the organization. Britton (1982), Hunter and Kleiner (2004) describe a grievance as "any disagreement that might arise between an employer and employee, which relates to the implied or explicit terms of the employment agreement" (p.85). Wijesooriya et al., (2021) explain grievances as signs of disappointment of staff members with the manner things are being accomplished in workplaces.

Some writers (e.g., Boden, 2003; Filip, 2013) view complaints positively. For Boden (2003), complaints are opportunities to assess how well the organization is performing its activities as well as to become aware of the weaknesses in the functioning of the organization so as to correct it. For Filip (2013) complaint is even more positive and ought to be welcomed and considered. Complaints and compliments are valuable sources of information that all organizations including educational organizations can use to improve program delivery and service (Latif et al., 2010).

In organizations, there can be different reasons for complaints. Capitalizing on this idea Hunter and Kleiner (2004) state the causes for complaints in organizations include negligence, unfair treatment, poor performance, absenteeism, substance abuse, and safety issues. Whatever the reasons for complaint are, complaints in organizations can emerge from an individual or collectively from staff members. Elaborating this idea, Ebire (2020) writes individual grievance is when an individual in organization submits own discontent on things that feels unfair; whereas collective grievances affect all the staff members. Ebire (2020) also puts causes of individual and collective grievances differently. The three major causes for individual complaints include personal discrimination, violation of seniority right, and unjust treatment. On the other hand,

collective grievances result from violation of any provision of collective agreement or legislation which could influence all or any of the employees.

Complaint handling mechanisms are ways in which organizations make use of dealing with confrontations that emanate from grievances. These mechanisms allow organizations to gather information regarding the functions taking place within that organization. Issues such as employee contract agreement, rules and regulations, policy or procedure, past practices, changing the cultural norms, individual interest and the like can be dealt with these mechanisms (Kumar, 2013).

Derr (1972) asserts as the nature of conflicts in organizations varies, the mechanisms to deal on each of the conflicts require different approach based on the nature of that unique organization. So having the information, the management can address individual grievances and improve the quality of administrative systems over time. Every staff member is provided variety of ways of filing complaints like through installing complaint boxes accessible to all, complaint committees, setting up complaint telephone numbers, and through preparing any convenient complaint forms. The management also needs to deal with each complaint carefully. Organizations may have different mechanisms in which they employ to deal with complaints arising from their employees. Stressing the importance of complaint handling mechanisms and techniques in organizations Latif, et al., noted "there are much to lose by ignoring complaints and much to be gained by having an effective complaint management system" (2010, p.8).

Different scholars forwarded varieties of means to deal with conflicts in an organization. Latif et al., (2010) suggest there must be conducive work environment so as to implement effective complaint management system in the organization. Hence, as far as the organizations culture is concerned, they uphold three important points that need to be taken in to account: acceptance, commitment, and communication. The management and employees should recognize and accept the potential benefits to be gained by managing complaints as complaints are important part of responsibility. This also helps to build the image of the organization positively. Besides, in a given organization, there must be commitment from the top to down in order to ensure that the complaint management system is widely recognized, maintained, and not be disregarded. The other key idea in the organizations culture is communication. The organization must facilitate complaints friendly environment via encouraging free discussion sessions and open communication with complainants on the issue raised.

Derr (1972) describes ways of resolving conflicts as follows:

> *There are three major ways to resolve the variety of conflicts arising in a complex organization. First, it is possible to train administrators to cope with the various conflicts. Second, organizational developers can intervene to change the ongoing processes and structures of the organization to better prepare it for that lie ahead. Third, the substantive and procedural problems that breed destructive conflicts should be resolved.* (p. 498)

Some important skills are also imperative to understand any conflict or complaint situations and help to come up with solutions or proposals to respond to the situation via facilitating smooth communication with the other party. Negotiations or persuasions are important in the context of good staff relationship. As outlined by Sean (2010) there are about seven essential competencies to deal with complaints: listening, communication, problem solving, Interpersonal, persuasion, integrity and customer service skills. Sean further noted that, these competencies can be learned. Moreover, the complaints arising because of different reasons and need be solved in accordance with the rules and regulations of the organization.

Statement of the Problem

Complaints can impede goal effectiveness in organizations. Any sort of relationship among employees of an organization cannot be free from grievance or complaint. As noted by Rahim (2017), in an organization, a complaint is the most complex matter that requires proper handling skills.

Like other organizations, educational organizations are not the exception. District education office is an office that is responsible for carrying out government education programs and policies with in specified area or town administration. The rapport among workers, management and employees is crucial for the smooth functioning of the activities in an organization.

In the Ethiopian context, since 1994, following the implementation of decentralization policy in the federal structure of the country, educational leaders at district level have had major roles. According to Ministry of Education (2010) the respective district education offices of all regions have the authority to decide on fundamental issues like selection of teachers and other supporting staff, placement of leadership and school principals, implementing plans and programs, use of the budget allocated and other various issues in relation to the management of resources. This, therefore, necessitates managing complaints arising from the staff properly as crucial factor in the process of attaining organizational goals (Sean, 2010).

Staff complaints may arise because of different reasons. Meanwhile, the complaint handling mechanisms employed by the organizations by far can influence the staff commitment. Stressing this idea, Ombudsman Western Australia Guidelines (2017) affirm the big value that effective complaint handling system has to do with the provision of a quality service in organizations.

To improve the quality of the education given as well as to make education more relevant to the demands of the community, the role of educational leaders in planning and coordinating the teaching learning processes at all levels in the system is of a paramount importance. Besides, educational leaders have a critical role in the realization of educational goals through proper complaint handling mechanisms (Ministry of Education, 2015).

The way in which managers in an organization deploy the management practices such as human resources management activities can potentially influence the employee's level of organizational

commitment (Buck & Watson, 2002). To my knowledge, there are limited studies conducted in similar education offices on staff complaints and handling mechanisms. Particularly, no study has been conducted on such sub-urban areas as Sebeta town education office. In aspiring to fill this gap, therefore, I move toward working on this study.

Hence, this study aims to look into the nature of staff complaints and its handling mechanisms in Sebeta town education office of Oromia region, Ethiopia. The following are the basic questions to be addressed:

1. What are the reasons for employees' complaint in Sebeta town administration education office?
2. What are the prevailing views of management towards staff complaint and its consequence on organizational effectiveness?
3. How are complaints perceived and handled in Sebeta town administration education office?

Methodology

Research Methods

As the intention of the study is to investigate the nature of staff complaints in the study area, qualitative research methodology was applied. Patton (2002) highlights the appropriateness of qualitative research to study detailed and an in-depth understanding of respondents' perception and analysis of a range of guidelines. For deeper understanding of the subject under study and to examine in detail the nature and the how of staff complaint handling mechanisms in Sebeta town education office in which there are 31 staff members, case study is employed as the research design. Bogdan and Biklen (2006) explain the significance of research design in qualitative research to collect data, to match the methods with the research aims, to use the right kind of analysis to answer the basic questions and draw valid conclusions.

As it allows for a comprehensive analysis of the problem under study, the scope of this study is limited to Sebeta town education office. This is mainly because there are large numbers of schools (237) under its administration. The effectiveness of staff in the education office to the over whole school system in the administration is mandatory. The education office provides holistic support to all the schools under its supervision and their respective communities such as teachers, students, administrative staffs, and Parent Teachers Association.

Participants

This study is a case study that focuses specifically on one town, i.e., Sebeta town administration. Sebeta town education office holds thirty-one staff members. Of the total, eleven respondents including team leaders, senior staff members, and office grievance committee members were selected purposefully. Accordingly, four team leaders, four staff members and three office grievance committee members were included in the study. Face-to-face semi structured interviews which lasted for minimum of thirty minutes were held with each interviewee who

participated in the study voluntarily. A total of eleven interviews were conducted. Collecting interview data helped in gathering rich information from the respondents.

Except two, the other respondents were male. With regard to the marital status all respondents were married and had a work experience ranging from a minimum of nine years to a maximum of thirty-one years. In the Office there are eight teams. Under each team there are three to six employees. Hence, according to the office structure each team leader is responsible to handle the complaints that arise within the team before the issue is escalated to the grievance committee at office level.

Instruments

Interview guide and document analysis were data gathering tools used in the study. To achieve the objectives of the study, semi-structured individual interviews were used. As a data gathering instrument, interview gives opportunities to the interviewer to carry out an in-depth investigation and helps to extend further questions based on the respondents' response. And also, it provides a chance to the interviewee to clarify more openly what he/she knows and feels about the issue under study (Best & Kahn, 2003; Creswell& Creswell, 2017).

Except for one interview that was conducted over the phone, all interviews were conducted face-to-face. From my rapport with them, the interviewees were not comfortable to be audio taped and as a result, I focused on rather creating a very relaxed and encouraging relationship so as to allow them to express their views. At times, during an interview if the interviewee feels that something is 'confidential' from his/her explanation, it is preferable not to audiotape than losing data (Rapley, 2004).

During the interview session, I was encouraging and using prompts to help the respondents respond freely and confidently on the issue: and almost all respondents were highly interested in the issue under study. I was taking detailed notes while interviewing. All the interview sessions were conducted in Afaan Oromoo language and then translated into English for further analysis; and these translations were the main sources of data in the study. As some contend, this gives an opportunity to speak their concerns and even asked me to report the findings of the research to the upper level of their organization; to the Regional Education Bureau, in which most of their concerns might probably be resolved and get decision as they anticipate.

Regarding document analysis, documents such as grievance committee minutes, the committee reports, human resource manuals, letters from regional education bureau and documents such as organizational manuals, rules and regulation manuals, management minutes, and letters written by the grievance committee were consulted. Besides, I observed in person the whole work atmosphere and the relationship between staff members for two weeks.

Data analysis

The data gained through semi- structured interview was jotted carefully and then content and descriptive analysis methods were used. In so doing, I coded the collected data so as to obtain different themes and edited accordingly. In addition, in the descriptive analysis citations were used frequently so as to align with the views of the research participants. Codes like (S1, S2, and S3 … S11) were given to respondents. Patton (2002) contends on the aim of content analysis that content analysis is used to identify patterns in the major themes from the relatively large qualitative data collected so as to give the collected data unambiguous structure.

To have further verification that can be used to substantiate issues arising from the interview data, the relevant office documents in the office were analyzed. These documents were useful to look at organizational responses towards the staff complaints raised in the office.

Ethical Considerations

Ethical considerations let research participants are informed and voluntary to participate in the research. To have the required data in a study, the researcher ought to provide necessary information with respect to the aims, nature and procedures of the study as necessary (Cohen et al., 2005). Accordingly, to conduct this study, permission was obtained from the education office head by informing the purpose of the study. Following that staff members were consulted and as a result each of the respondents agreed in advance to be part of the study. For confidentiality purpose, codes (S1, S2, and S3…S11) were used instead of the participants' real names to classify the respondents' response in the process of data analysis.

Results

As the intention of the study was to assess the causes for employees' complaints and the ways of managing the complaints, a number of causes for and ways of managing complaints were identified in the study. Accordingly, to deal with the research questions raised a number of assertions were derived.

Causes for employees' complaints

Regarding causes for employees' complaints, the findings of the research have been organized under four themes:

- Conflicts in relation to organizational structure.
- Conflicts stemming from the individual differences.
- Conflicts emanating from the management.
- Conflicts originating from stringency and unfairness.

The above four themes are treated in more detail as follows.

a) Conflicts related to organizational structure.

Within this 1st category, respondents discussed freely regarding the problem of the organizational structure and related challenges they are facing. The structure of the organization has been changing frequently. As could be understood from the responses of the respondents, last year forty three positions were there in the structure of the organization, but that has been minimized to thirty four this year. Respondents complained that the change took place without deep investigation on the weaknesses and strong sides of the previous structure. A remark by one of the respondents among the team leaders is more telling:

> *Over the last five years alone, we passed through three different organizational structures which ended up in confusing the employees. Besides, issues related to career structure are sometimes unfair. At times, those with twenty years of experience are treated equally with those who have seven years of work experience. This clearly shows how those at regional education bureau working on this issue are too careless in designing the structure of the organization. (S4)*

Despite the required qualification and experience, because of the organizational structure, within the office itself, grade level of employees and related salaries vary from team to team. Besides, some teams are overloaded while others are not. This disparity among the staff members can be a source of complaints. "Not only in relation to other government sectors", says a respondent, "but also the structure of the teams' (departments) within the organization itself are sources of complaints to most staff members" (S1). From the document analysis I made on the organizational structure of the office, I also found that team's workload is not divided fairly.

More to the imbalance between the staff members, as a respondent addresses, "Most teachers in the schools we supervised were better than most of us in terms of salary, career structure and other benefits." He further added, "because of this factor most staff members were uncomfortable". Another respondent also had this to say on this issue,

> *If we compare a staff member from the education office and a staff from high school, in most circumstances the one at the school is better than that of the office [worker] in the amount of monthly salary and opportunity for career structure and further education. Besides, while we compare other government sector organizations to education office, we are deprived of many things; like unequal salary structure and different organizational benefits. (S9)*

It can be argued that the staff's complaints are related to what Brewer and Lam, (2009) highlighted regarding the importance of career improvement and financial rewards in the organizational effectiveness through smoothening interactions between the management and the subordinates.

b) Conflicts stemming from individual differences.

Individuals in an organization can have different views of the things they encounter in their surrounding and thereby can act differently. While some staff members showed their concern

plainly, some others hesitated to express their feelings freely and keep calm. Stressing the same idea, Milliken et al., (2003) reported in their study that some employees remained silent for not being viewed negatively and that resulted in damaging relationships. Edwards' (2005) stated, rather directly presenting their complaint to the concerned body formally, some employees were seen while moaning, ranting, biased, prone to complaining, whining, paranoid, and being over-sensitive.

According to the results of the study, it was found that some experienced staff members (S1, S4, S7) are busy in their social life and sometimes share their burden to their colleagues. As there are some staff members who are committed to the unity and cohesiveness of the office, there are also others who lag behind on the issue. Regarding the way of handling complaints, some staff members are less satisfied on the management (S2, S3, S10, S11), others are optimistic on the management (S5, S7, S9).

Though individual difference is expected, the unity and cohesiveness of the staff members is significant in addressing complaints raised in organizations. Emphasizing the importance of harmonious relationship among the staff members, one participant said:

> *Though there are some difficult issues that can't be addressed by the office management directly, the unity of the staff by itself can play greatest role in addressing grievance related issues arising from all the staff members via letting them [voicing] laud high as a team. (S5).*

Highlighting the importance of harmonious relationship between staff members to organizational goal attainment in general and for the benefit of individual staff members in particular, a respondent commented, "Let alone positive relationship among staff members here, but also there should be well-built tie between the education office and other education stakeholders such as school principals, teachers, and students' parents" (S9). Adding to the idea, another respondent says, "Though we are from different background and experience, we are working for the same organization. This forced us to give priority to organizational goal than individual interest" (S6). On the other hand, in explaining the individual differences as a cause for complaint in the office, one respondent made clear that "even if most staff members talk about the supremacy of organizational goal than individual interest, but in practice every one is striving to fulfil his own individual interest in the office" (S8).

c) Conflicts emanating from the management.

All the challenges that are observed in the education system of the town administration are related to the education office which is responsible for the overall functioning of the education in the town. The organizational structure of the education office comprises eight departments. Each department has its own head; in which the head is the member of the office management

committee. Therefore, in the education office including the office head, there are nine individuals in the management committee.

As one respondent claims, "In most cases the management of the office instead of directly trying to solve the complaints arising from the staff members, tries to treat employees with mere pledge" (S11). Another respondent notes, "Treating employees sympathetically is not bad…but sometimes mere promise given to employees is likely to later worsen the issue more " (S3).

Another respondent said:

> *Obviously, the office head cannot be free from the imposition of the top managers especially that of political leaders. Meanwhile, he should always stand with his staff members. Regardless of conditions and pressures from top level managers and the politicians he must give priority to the concern of his staff members (S1).*

Management committee of the office which comprises 8 team leaders and the office head at times try to deal on employees' grievances so as to solve issues informally before submitting it to the complaint committee and be filed formally.

At some point, though the management is willing to solve employee complaints, it fails to do so because things are beyond the office's capability. As one respondent contends, "The allocation of insignificant amount of daily allowance to staff members as well as few education and training opportunities provided to the office workers are beyond the responsibility of office management" (S7). Stressing as the situations are discouraging to staff members, another respondent expressed a concern. "Issues related to minimal amount of per-diem and little education opportunities to staff members," decries the respondent, "are complaints without solution" (S2).

Complaint on poor results given to performance evaluation is also one reason as far as the management is concerned. The other challenge from the management side is, instead of focusing on the output of the activities, sometimes there is a tendency to focus on attendance sheet only. As pointed out by a respondent, "Though I am not blaming the necessity of attendance sheet, focusing much on it is not good; it hampers staff initiations resulting in poor morale and leads to poor performance" (S7). Some respondents also raised issues on the misconceptions from the management side. For S11 said:

> *If there is an extra ordinary effort from an employee towards his responsibilities, sometimes the view of the management is not positive; they associate such effort with individual benefit rather than that of the organization (S11).*

From the interview I conducted with some of the respondents, I found out that there is no practice that focuses on questioning the upper echelon (the town council/management team or the regional education bureau) even towards some challenging duties to the staff members in particular and to the office in general. A remark by a respondent illustrates the situation well:

From the office management side, there should be a practice to challenge and question the upper-level managers. From my long years of experience in this office, I have seen no one challenging them. The office management accepts everything flowing down to the office. But as to me the office management must learn to say 'no' to some shaky issues for the sake of overall organizational goal achievement (S10).

d) Conflicts originating from stringency and unfairness.

Under this theme, respondents forwarded their views on the unique characteristics that depict the ways in which tasks are being accomplished in their office. The number of staff members in the office is quite few as compared with the duties and responsibilities expected of the staff. A true indicator is that the education office is responsible to supervise a total of two hundred thirty-seven government and private schools found in the town administration. This situation has created burden on the staff members to supervise, manage, and provide the required support.

According to some of the respondents (S2, S6, and S11) the way that some staff members are working is different from the others. They contend that some staff members do their work as they like without following the proper schedule or in any convenient time to them. They come to office any time they like and leave the office suddenly. While explaining the reason, S9 says "Because of the variation in the intensity of the work load between staff members, some are enjoying their time while others are burdened by routine activities they are expected to accomplish." Respondents S2, S6, and S11 also asserted that such a condition has created discomfort to the others and unfair distribution of work load as stipulated by the structure and job requirement can be taken as one possible source of complaint.

As the respondents reported, the more careless way of life in the office can hamper the motivation of some members; this kind of situation may favor those employees who took initiation by themselves to work their duty while leading others to be reluctant on their job. Even though the majority of the staff members are matured and experienced enough, the control from the management is mandatory and maintains the work balance.

Despite the above challenges, almost all staff members have failed to accomplish their planned duty (activities) because of the repetitive emergency duties from higher officials of the town; e.g., unscheduled repeated meetings, emergency report compilation and the like are some of the causes as the respondents mentioned. Taking too long-time during staff meetings on irrelevant issues is the other concern that staff members have complained about as "Most staff meetings are boring, repeated, time consuming and are without values; in some circumstances even, the meetings used to end up with creating an extra argument." (S7)

Mechanisms of managing complaints

As complaints are inevitable in organizations, the mechanisms in which organizations make use of handling complaints really matters. Hence, an organizational system should address such

inconveniencies. One possible way of addressing complaints is the use of complaint procedure acknowledged within the organization (Ombudsman Western Australia, 2017).

According to the respondents, there is formal complaint mechanism system in the education office in which staff members can present their concerns. From documents such as complaint committee minutes and related documents, a document showing the organizational structure of the office, letters written by the office complaint committee, office guidelines on complaints show the presence of formal complaint filing ways. That is consistent with Kolb's (1987) contention that almost all organizations have set a unit in which they manage the conflicts emerging amongst members of that particular organization.

Despite the availability of the complaint handling mechanism in the education office, except few major complaints like career structure and issues related to education opportunity, most complaints don't seem to be tabled as per the formal channel. That is because whether they complain formally or informally, they personally believe their problem may not be solved. Instead of expressing formal complaints "Most staff members explain their concerns or grievances informally: like feeling discomforts, weak work tempo, ignoring, few responses and the like" (S3).

The discipline (complaint) committee as a unit established at office level deals with any grievance from the employees. From the document analysis I made, this is also put on the text of the committee: 'any staff member can present his/her issues to the committee'. Individual staff members can file their complaints in writing to the committee. Based on the established rules and regulations of the office, the committee then makes decision on the issue. This committee also has the mandate to see issues or disputes coming to office from all the schools in the town administration.

Discussion

In organizations, job dissatisfaction can emanate from weak complaint handling mechanisms. This in turn has a negative impact on organizations' performance. Therefore, complaints emanating from employees need to be treated carefully. For the smooth implementation of organizational functions, human resource offices are responsible.

In this study, I tried to see the reasons for staff complaints and how they are handled by the management in Sebeta town education office, Ethiopia. As far as complaint handling in the office is concerned, I can say the general feeling of the respondents is not good. Staff members are not happy in their work life; the payment and the duties, roles and responsibilities of the staff members are not sufficient; no balanced payment for the work done. As the respondents repeatedly claim, the payment is minimal in relation to their duty and dissatisfied with their jobs. They are also disappointed with the academic results of their students.

Four major sources of staff complaints have been identified. The first category is about the organizational structure comprising eight teams or departments; each department with varieties of

duties and varying intensity as well: without the variation in the amount of monthly salary. This creates discomfort among some staff members because it made them busy. As job structure design might have assumed proportional, to my observation this condition is upsetting because some are busy and dissatisfied with the job structure. Others are in favor of the variation in the organizational job structure and enjoying the leisure time because of their fewer loads compared with other staff members on parallel positions.

The second category focuses on the individual differences. Though no two men are alike, the individual difference in terms of background, qualification, experience, position and the like are causes for viewing things from different perspective and ultimately leads to a sort of disagreement.

The other reason stems from the management side. Though it is difficult to the office management to satisfy the interest of all its staff members, there are some issues that, if given due attention by the management, can make the smooth functioning of the organization possible. This is possible upon facilitating open discussion sessions and information exchange, searching for alternatives, examining differences, and treating all equally. For the continuous improvement of their administration, the management of education offices should handle complaints properly, with patience and understanding, and provide on time responses within an appropriate time frame. Complaints that are not handled properly have influence on the motivation and morale of the staff (Danku et al., 2015)

The fourth category focuses on the ways in which tasks are being accomplished in the office; such as stringency and unfairness observed in the organization. This is closely related to the management as well as employees' difference in their personalities; as these differences influence the way they react to the circumstances that exist in the organization.

With all the discontent mentioned, staff members fail to accomplish their duty efficiently. Moreover, the management should deal with employees' grievances regularly as the major causes for staff complaint identified can affect staff morale and resulted on poor performance of the education sector. Lower employee morale, frequently changing organizational structure, little education opportunity, and transfer or promotion related issues were mentioned as the causes for employee grievances.

Managing staff complaints properly creates good working environment in an office. Failing to address employees' complaints early in the workplace leads to dissatisfaction. If employees are dissatisfied in their work place, they lack interest and enthusiasm to their work; they impede the job; they become absent from work; they get stressed and thus show decline in their performance.

To build a satisfying work environment, the management of the office needs to be keen on handling the complaints from the staff. The management also needs to gather employees' feedback on each circumstance. Besides, the management ought to appreciate the employees for their effort. In any possible means, to deal with their financial difficulties, the management must promote

performance bonuses and promotions through compensation strategies. To enhance workplace relationships and work life balance, training and development opportunities need to be promoted in organizations.

Conclusions

An ample amount of time should be spent by the management to understand employee grievances. There may be a number of significant or insignificant factors which may cause grievances in an organization. This study intends to unpack the nature and reasons of staff complaints in the education office. Though there was formal complaint handling mechanism in the office; few staff members make use of the formal mechanism. According to the stipulated regulations, staff members present any grievance they have in written form to the staff grievance committee so that the committee deals on the issue. The main complaints witnessed in the education office include conflicts in relation to organizational structure, individual differences, and the management stringency and unfairness. With respect to office grievance handling procedure, almost all staff members in the education office had plenty of knowledge concerning the matter.

An effective complaint management system is an essential part of quality services. Fair and just treatment for all the staff members from the office management enhances mutual communication and acceptability among the staff. As a whole, the education office should refer to higher officials complaints that cannot be solved easily at office level but raised frequently by staff members so that all grievances can be addressed to the level expected.

Implications

- The office management should give priority in handling complaints that can rise from the staff members.
- Discussion sessions at office level should be prepared on a regular basis to allow staff members to discuss freely so as to make possible conducive working environment.
- Incentive system has to be established to encourage staff members accomplish their job actively.
- The office management together with stakeholders at town/district level should notify upper echelons (Regional Education Bureau) in relation to challenges they are facing because of the frequently changing office structure by regulation.

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