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Challenges in developing, standardizing and implementing Primary Education Amharic Terminologies

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Abstract

Terminologies are crucial for effectively conveying technical concepts across various school subjects. Although Amharic has served as the medium of instruction in primary education since 1958/59, it is necessary to update its terminologies to reflect current developments. Consequently, this research aimed to identify the challenges involved in developing, standardizing, and implementing Primary Education Amharic Terminologies (PEATs). The study employed a descriptive research design. Qualitative data were collected through questionnaires completed by textbook authors, teachers, students, and parents. Additionally, interviews were conducted with experts from curriculum development units and relevant government institutions in both the Amhara region and at the federal level. Focus group discussions were also held with students in Grades five and six. Furthermore, the research involved reviewing textbooks for Civics & Ethical Education, Integrated Science, Mathematics, and Social Studies for these grades to identify relevant terminologies. The qualitative data were analyzed using thematic analysis, complemented by methods aligned with term formation principles and terminology standards. The findings revealed several challenges impeding the development, standardization, and implementation of PEATs. These included the lack of a national coordinating body for terminological work, limited awareness of the importance of terminologies in teaching and learning, insufficient collaboration among stakeholders, and the absence of research-based initiatives in terminology development. To improve the quality of education in the mother tongue and address these issues, the study recommends a planned approach to the development, standardization, and implementation of terminologies. This approach should be grounded in research, supported by training and public awareness campaigns, and fostered through inter-institutional cooperation.

Keywords: Quality Primary Education, Terminology, Terminology development, Terminology standardization, Terminology implementation

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Introduction

UNESCO documents (1953, 2003), along with the research of scholars such as Pinnock (2009), Heugh al. (2007), and Kadel (2010), emphasize that a student's mother tongue or home language is the most effective medium of instruction (MoI). This highlights that insufficient proficiency in the MoI adversely affects students' learning outcomes (Kembo, 2000; Quane & Glanz, 2010). As a result, low proficiency in the MoI can hinder students' performance in subjects like mathematics and the sciences, which rely heavily on advanced language cognitive skills (Sure & Ogechi, 2009). Furthermore, Walter (2008) points out that the impact of language proficiency extends beyond primary education, potentially contributing to a lack of development that can hinder societal progress over time. This situation underscores the need to empower local languages for use in education and specialized communications. To achieve this, addressing language policy issues is essential, followed by the development of terminology and related resources.

Indeed, terminologies serve not only to articulate knowledge but also to generate, preserve, obtain, and convey professional expertise (Antia, 2000). This can be realized through the thoughtful development, standardization, and implementation of terminologies.

Terminology development involves the creation of new terms to represent emerging scientific, technological, and societal concepts. When a language lacks the necessary terms for these new ideas, it becomes essential to generate appropriate terms. During this process, various alternatives may arise, especially through natural language processing by different expert users. In some cases, existing terms may be linguistically inadequate—whether they are cumbersome, poorly structured, or imprecise—or they might carry negative connotations, causing confusion or hindering effective communication (Sager, 1990; Nakos, 1983).

Specialized communication, particularly in fields that impact fundamental aspects of human life, demands a higher level of precision than general communication (Wüster, 1955). To ensure clarity, it is crucial to consistently use a single term to represent a given concept. Thus, the standardization of terminology is essential for achieving this level of precision and regulating specialized communication.

Furthermore, without the development of appropriate terminologies and effective implementation mechanisms, efforts to elevate a language's status or expand its use in various domains may be futile (Chabata, 2008). The development of terminology plays a vital role in the progress of developing nations like Ethiopia, particularly in promoting the use of the

mother tongue as the MoI across all fields of learning (Mutasa, 2006). Access to technical terms enhances a language's ability to support education in subjects such as mathematics, biology, chemistry, and physics, which rely heavily on specialized vocabulary. When terms are properly developed, standardized, and implemented, they can facilitate the transfer of knowledge. Conversely, the absence of clear and standardized terminology can hinder learning and knowledge transmission.

Overall, if the development, standardization, and implementation of terminology are not addressed systematically and rigorously, they can become significant barriers to effective communication between students and teachers, ultimately impeding the teaching and learning process and negatively impacting the quality of education.

However, mother tongue education is widely regarded as fundamental to cognitive development and a vital tool for preserving cultural knowledge and identity. It provides an effective means of conveying complex concepts in science, technology, and social development to learners in a language they are most familiar with. To achieve this, well-designed curriculum materials—such as syllabi, textbooks, teacher guides, handbooks, and instructional manuals—tailored to mother tongue education are essential (Bamgbose, 1991; Pearson, 1998).

Language plays a critical role in the creation of these educational materials. Knowledge transfer is impossible without an appropriate language of communication, which must be sufficiently developed to convey the curriculum's content effectively. This underscores the need for terminology development, which is key to building a knowledge-based society (Matsuda et al., 2008).

In many developing countries, one of the significant challenges faced by curriculum developers, particularly textbook authors, is the lack of subject-specific terminologies. Authors may either translate materials from developed languages (such as English or French) or write original content. Regardless of the approach, the absence of proper terminology can hinder the effective communication of knowledge, making it difficult for textbooks to serve their educational purpose. The development of terminology is thus a crucial area of research to ensure the successful use of indigenous languages in education and other sectors (Ferguson, 1977; Sager, 1990). Addressing this issue in textbooks could make a significant contribution to enhancing the quality of education.

Amharic, Ethiopia's working language (Federal Democratic Republic of Ethiopia, 1995) and lingua franca, is spoken by the majority

of the population as either a mother tongue or a second language (Meyer, 2006; Heugh et al., 2007; Baye, 2000 E.C.), and it is commonly used in everyday communication. However, its role in professional domains such as education, research, and academic discourse is still limited. One of the key reasons for this shortcoming is the lack of specialized technical terms in Amharic (Takkele, 2000; Abera, 2002; Mulugeta, 2008; Mesfin, 2000 E.C.).

Amharic has served as the MoI in primary education in Ethiopia since 1958/59 (McNab, 1989). However, as Takkele (2000, p. 12) observes, "Amharic is lagging behind in the field of education where the development of scientific and technological ideas are supposed to take root." This gap is partly due to the absence of appropriate terminologies needed to explain concepts across various academic subjects. McNab (1989) highlights that despite efforts to develop the language; there is still a significant need for further terminology development, particularly in the fields of science, technology, and political science, which are critical to societal progress.

Several studies (Alemayehu, 1970; Hailu, 1971; Amsalu, 1980; Assefa, 1984; Richter, 1988, 1989; Abraham, 1991; Polacek, 1994; Takkele, 2000; Addisu, 2006; Aragaw, 2009) have been conducted to address terminology problems in Amharic. These studies have identified several challenges in Amharic terminology development, including excessive borrowing from other languages, the proliferation of multiple terms for a single concept, and the lack of systematic approaches to managing terminology. They also emphasize the need for collaboration, standardization, and strong institutional efforts to address these challenges in a coordinated manner. The present study aims to build on these findings by offering a more comprehensive exploration of the issue using various data collection methods that include questionnaires, interviews, focus group discussions and document review.

The need to investigate challenges related to PEATs emerged from informal discussions the researcher had with teachers, parents, and colleagues in Bahir Dar city regarding the use of Amharic in teaching subjects such as Mathematics, Integrated Science, Civics & Ethical Education, and Social Studies in primary education. These discussions revealed that terminology-related issues have a negative impact on teaching and learning outcomes.

Moreover, numerous studies in the field of language and education (Takkele, 1975; Stoddart, 1986; Tekeste, 2006; Heugh et al., 2007; Mulugeta, 2008; Aynadis, 2012) have pointed out, Ethiopian students'

command of English is often limited. This signals the need to strengthen the capacity of indigenous languages like Amharic to ensure effective communication at all levels of education.

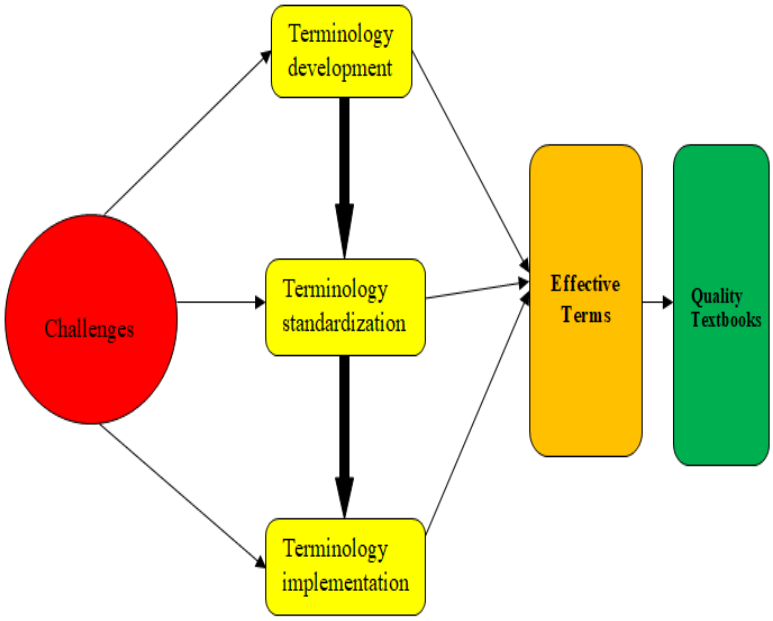
As noted earlier, inadequate management of terminology in Amharic could undermine the quality of education, the creation and dissemination of knowledge and skills, the communication of specialized fields, and the overall development of the language. However, a comprehensive study that thoroughly examines the challenges and offers solutions has yet to be conducted. Given the serious concerns expressed by users regarding the use of Amharic terminologies at the primary education level, it is crucial to investigate this issue further. Therefore, this study aims to answer the following central question: What are the challenges in developing, standardizing, and implementing Primary Education Amharic Terminologies?

Conceptual Framework

This research utilized the Communicative Theory of Terminology (CTT) as its theoretical foundation. CTT conceptualizes "terms" as interconnected components of knowledge, language, and communication, emphasizing the cognitive, linguistic, and socio-communicative elements that comprise them (Cabre, 2003). This highlights the theory's multidimensional character, which aids in comprehensively understanding and describing terminological units. In specialized communication, these units facilitate the transfer of specialized knowledge; for instance, in this study, the knowledge is conveyed from textbook authors and teachers to students. Accordingly, a language-based conceptual model, grounded in Cabre's (2003) expansive framework of CTT, has been developed and applied in the current research.

Figure 1

Conceptual Framework of the Study



The conceptual framework illustrated in Figure 1 highlights the challenges associated with developing, standardizing, and implementing terminologies that can impact the efficacy of terminological units within the teaching and learning process of mother tongue medium primary education.

Method of the Study

The primary aim of this research was to examine the challenges associated with the development, standardization, and implementation of PEATs. To achieve this goal, a descriptive research design was utilized. To gather the essential data, participation came from students, textbook authors, teachers, parents, and curriculum specialists, along with other experts from relevant institutions.

Textbooks for Civics & Ethical Education, Mathematics, Integrated Science, and Social Studies for grades five and six were selected using a purposive sampling method. The Bahir Dar City Administration, located in the Amhara National Regional State (ANRS), was intentionally chosen as the site for gathering data from students, teachers, and parents; because

the research problem was identified there. To ensure the samples represented the research area adequately, subjects were drawn from both government and private schools. In 2006 E.C., Bahir Dar City had a total of 45 primary schools, consisting of 25 government and 20 private institutions. From these, four government schools (ïwïqät Fana, ťäyïma, ťis Abbay, and Wäräb) and one private school (Bahir Dar Academy) were randomly selected.

A multistage cluster sampling technique was used to select 363 students in grades five and six, while 202 teachers from these grades and 32 textbook authors were nominated through a comprehensive sampling approach. Snowball sampling was utilized to identify 143 eligible literate parents via their children. Additionally, purposive sampling was employed to select 16 experts from relevant government organizations.

Data collection instruments

Data collection instruments were document review, questionnaires, Focus Group Discussions (FGDs), and semi-structured interviews.

Document review

A document review was conducted to identify Amharic terminologies within fifth-and sixth-grade textbooks for Civics & Ethical Education (Shewakena et al., 2003a E.C., 2003b E.C.), Mathematics (Mulugeta, 2003 E.C.; Getachew, 2003 E.C), Integrated Science (Daniel et al., 2004 E.C.; Gebeyehu et al., 2004 E.C.), and Social Studies (Berhanu, 2003 E.C.; Wondmagegn, 2003 E.C.) in primary education. Candidate terms were manually extracted from content words by the researcher using a rating scale approach adapted from Chung (2003), and Chung & Nation (2004). This rating scale is used to assess the strength of the relationship between a word and a specific specialized field or subject.

The reliability of the rating scale was evaluated using Cronbach's alpha to measure inter-rater agreement. The reliability coefficients for the subjects were as follows: Civics & Ethical Education (.948), Integrated Science (.982), Mathematics (.975), and Social Studies (.876). Since all values exceeded the threshold of .7 at a 0.05 confidence level, the rating scale was deemed reliable.

Furthermore, the validity of the term extraction methodology was verified by cross-referencing identified Amharic terms with their equivalents in the syllabuses (Ministry of Education, 2011a, 2011b, 2011c, 2011d, 2011e, 2011f, 2011g, 2011h) and textbooks written in English by the Ministry of Education (MoE) for grades five and six (Abera & Mohan, 2003a E.C, 2003b E.C; Berhanu & Wondimagegn, 2003

E.C; Wondimagegn & Berhanu, 2003 E.C; Shewakena et al., 2002a E.C., 2002b E.C.), except for the Integrated Science textbooks (Abate et al., 2004 E.C.; Zenebe et al., 2004 E.C.) which were prepared by the Southern Nations, Nationalities and Peoples Regional State Education Bureau. Additionally, monolingual dictionaries—Addis Yamarïñña Mäzïgäbä qalat (Desta, 1970) and Amarïñña Mäzïgäbä qalat (Ethiopian Languages Research Centre, 1993)—as well as the English-Amharic bilingual dictionary Science and Technology Dictionary: English-Amharic (Academy of Ethiopian Languages, 1996), were utilized to further validate the rating scale.

Ultimately, the document review, employing the rating scale approach, identified 441 candidate terms from Civics & Ethical Education, 1028 from Integrated Science, 403 from Mathematics, and 707 from Social Studies, totaling 2,579 candidate terms across the four subjects. The data obtained through this review process provided a foundation for subsequent data analyses.

Questionnaires

Data was collected from four key stakeholders: students, teachers, parents, and textbook writers using four distinct questionnaires. These questionnaires were developed based on a thorough review of relevant literature in language planning and educational psychology. Subsequently, they were refined through feedback from linguistics and education professionals.

Students in grades five and six completed a questionnaire with four open-ended questions. Following careful orientation and monitoring, 363 valid student questionnaires were collected. Similarly, teachers of Civics & Ethical Education, Mathematics, Integrated Science, and Social Studies in grades five and six completed a questionnaire with four open-ended questions, yielding 202 valid responses.

A separate questionnaire with four open-ended questions was administered to parents of fifth and sixth-grade students, focusing on terminological challenges they encounter while assisting their children. A total of 143 valid parental responses were obtained. Finally, a questionnaire with three open-ended questions was administered to textbook writers, resulting in 32 valid responses.

Interviews

Semi-structured interviews were conducted in Amharic with two distinct groups of experts: curriculum specialists and representatives from relevant government institutions. The curriculum specialists were drawn

from the Amhara Region Education Bureau and the MoE. The institutional representatives included experts from both regional and national bodies, specifically, the ANRS Culture, Tourism, and Parks Bureau at the regional level, and at the national level, the Ethiopian Languages and Cultures Academy, the Ministry of Culture and Tourism, the Ethiopian Standards Agency, and the Ministry of Science and Technology.

Separate interview guides were developed, comprising 14 questions for curriculum experts and 11 for government institution representatives. These guides underwent rigorous evaluation by research supervisors, two psychologists, one linguist, and one Amharic language teaching expert. Subsequent revisions were incorporated based on the evaluation feedback and insights gleaned from a pilot study.

A total of 16 experts were interviewed across 13 individual sessions and one group interview. The group interview involved three Integrated Science (Biology, Chemistry, and Physics) curriculum experts from the Amhara Region Education Bureau. All interviews were audio-recorded with the interviewees' consent, subsequently transcribed verbatim, and translated into English.

Focus Group Discussions

The FGD guide comprised six questions. Students from both government and private primary schools in grades five and six participated in these discussions. Specifically, participants were drawn from government primary schools, including ǐwïqät Fana, ťis Abbay, and Wäräb, as well as from the private, Bahir Dar Academy. Prior to the discussions, consent was obtained from all participants. A total of 63 students participated in the FGDs, with 31 from Grade 5 and 32 from Grade 6. The study included eight FGD sessions, comprised of four sessions with fifth-grade students and four with sixth-grade students. All sessions were recorded using a tape recorder, transcribed verbatim, and subsequently translated into English.

Methods of data analysis

This research utilized qualitative methods for data collection and analysis. The qualitative data collected from document reviews, questionnaires, interviews, and FGDs were examined using linguistic and thematic analysis techniques. Linguistic analysis was applied specifically to the data gathered from document reviews primarily based on ISO 704 (2000, 2009), while thematic analysis was used for the data obtained from questionnaires, interviews, and FGDs.

Results analysis

The data were analyzed to identify the challenges associated with developing, standardizing, and implementing PEATs. The analysis was comprehensive, integrating themes from multiple data sources to ensure a thorough understanding of the issues. Recognizing that individual themes may overlap or be difficult to distinguish, the analysis was structured systematically. It began with an examination of general challenges affecting all aspects of primary education Amharic terminology-related endeavors, and then progressed to more specific issues related to PEATs development, standardization, and implementation in a sequential manner.

General challenges

The following general challenges are identified by experts from curriculum and relevant government institutions:

A. Limited interest of the current government to develop Amharic: Since the attention is on the other languages, especially minorities languages, it is very difficult to say much effort is made to develop Amharic so as to make the language competent in expressing the present conditions to enhance the social, economic and political developments of the country.

B. Absence of an Institution that coordinates terminological works at a National level: There is no a concerned body that supports terminological works by policy and manage it in a systematic way.

C. Lack of awareness about the role of terminologies in teaching and learning process: Many curriculum experts and other concerned government bodies don't have enough conceptions about the role and nature of terminologies. As a result, the issues of terminologies are not given due attention.

D. Lack of collaboration among stakeholders: There is no tradition of working together. All concerned stakeholders do not participate in terminology development and other related activities during the preparation of textbooks.

E. Assuming that translation conceals a complete concept of a term: It is necessary to exert a great effort to avoid this thinking. Anything when it becomes common, it will be known. Besides, after it became familiar, it holds (communicates) the concept more. In order to change the thinking that discourages translation of terminologies into Amharic, awareness raising work should be done.

F. Absence of research-based terminology work: Many textbook authors and curriculum experts do not conduct thorough reviews of

existing curriculum materials to evaluate the strengths and weaknesses of current terminologies, select appropriate terms, or modify them as necessary for the new curriculum. This oversight has led to unnecessary duplication of terms. Additionally, issues concerning the development, standardization, and implementation of Amharic terminology are not clearly identified.

Challenges of Developing PEATs

The following pertinent challenges have emerged from the analysis:

A. Lack of sustainable efforts to develop Amharic terminologies at a project level: This problem is the result of considering the previous terminology works as sufficient and not taking the issues of Amharic terminology as a priority area.

B. Lack of knowledge about how to create new terms: Since there is lack of knowledge of how to develop new terminologies, sometimes term formation principles are not appropriately employed. As a result excessive and superfluous borrowings, incorrect term forms and ambiguous terms are observed.

Excessive and superfluous borrowings are employed instead of giving priority for target language or Amharic sources. Especially, there is a tendency to borrow many terminologies from Geez and to use them as they are Amharic terms. Moreover, there are many direct loan English terms. Excessive and superfluous borrowings are against the term formation principle *preference for native language expressions*-ISO 704 (2000, 2009). However, some parents and teachers believe that translating English terms into Amharic will create problem on students' future study, because starting from grade seven students learn Mathematics and Science subjects in English.

In relation to superfluous borrowing, there are some unnecessary direct loan terms that can be replaced by Amharic equivalents, e.g.,

(1) Subjects	Superfluous borrowing	Amharic equivalent	Gloss
Civics & Ethical education	taks	qäräť	tax
	kawïnïssïl	mämakïrt	council
	dispïlin	sïnä-sïrʔat	discipline
Integrated science	miniral	maʔïddïn	mineral
	bakteriya	tähawasiyan	bacteria
	gil	sïnťťïb	gill
Mathematics	diyagonal	sïllaš	diagonal
	pärsänt	mätoññña	percent
Social studies	sämär	kïrämt	summer
	hagay	bega	winter

Based on the data presented above, there are well-established Amharic equivalents for all superfluous terms. Therefore, such duplications should be avoided during the term development process. All the listed terms are borrowed from English, except for the last one, "hagay," which is borrowed from Ge'ez. Additionally, unnecessary borrowing is evident in the formation of hybrid terms, as demonstrated by the following examples:

(2) Subject	Superfluous borrowing	Amharic equivalent	Gloss
Integrated science	seri ïtbät	täkätatay ïtbät	series circuit
	karbon kïlto oksayïd	karbonhulät okïsayïd	carbon dioxide

In the examples given above, the English word “series” and the Geez word “kïlto” could have been replaced by the target language words *täkätatay* and *hulät*, respectively.

The following examples also show the presence of *linguistic incorrectness* in term formation:

(3) Subject	Incorrect forms	Correct forms	Gloss
Integrated science	mästägabïr hïgg	mästägabïr*awi* hïgg	interactional law
	maʔïkäl käbabi ayyär	maʔïkäl*awi* käbabi ayyär	stratosphere
	ašawa dïngay	ašaw*amma* dïngay	sand stone
	asid zïnab	asid*amma* zïnab	acid rain
	sïmmet abalä akal	(*yä*)sïmmet hïwasat	sense organ

Since in the formation of most of the above Amharic terms the adjectivization morphemes *-awi* and *-amma* were not used, the constituents of the compound terms lack cohesion. Besides, the elements of the compound term *sïmmet abalä akal* "sense organ" also are not well patterned. Such incorrect formation causes the terms to convey vague concepts.

Some deviant term formations are also observed in some subjects as illustrated in the following examples:

(4) *In Mathematics*: Instead of *sost gon* "triangle" the term *gonnä-sost* is used.

In Integrated Science: Instead of *yäs΄ähay aqqämamät'* "position of the sun" the term *yäs΄hay qïmt'ät* is used.

Some terms lack *appropriateness*, and in some cases similar words are assigned to refer different concepts without a clear justification, e.g.,

(5) *In Integrated science***:** The term *wïhïd* stands for "compound" and the term *dïbïllïq* stands for "mixture".

In Social studies: The term *zurit* stands for "revolution" and the term *šïkïrkïrit* stands for "rotation".

Moreover, in Integrated Science the term *tubo* is used to translate the English term "y-tube". Since the term *tubo* conveys a general idea, it does not communicate the specific meaning the source language term holds.

Some of the newly coined Amharic terms are ambiguous because they *lack transparency*, and students cannot infer the meanings of such terms from their parts, e.g.,

(6) Subject	**Opaque Amharic terms**	**Gloss**
Integrated science	mäs΄ägbär	react
	moggajj	resistor
	bïranfi	cornea
	tïnmäz, tïnbär	glottis
	ïtbät	circuit
	gïnbanïddät	metabolism

The terms in (6) are not transparent because their morphological parts do not give clue for users to understand their meanings.

Therefore, the above analysis reveals that lack of knowledge about term formation principles led to improper utilization of term formation methods. This will, in turn, be an obstacle to use Amharic as a source of terminologies at a required level.

C. Lack of translation skills: Individuals have formed terminologies in different domains to do translation works, but several of them have made mistakes. During translation, sometimes, terms that are difficult for most parts of the society are used, and in some cases, such terms don't express the intended concept of the source language term accurately. For example,

(7) *In Integrated science:* The term "homogeneous mixture" is translated as *wïhïd zär dïbïllïq* and *wahïd zär dïbïllïq*. The second translation better communicates the concept of the source language term.

In Mathematics: One of the candidate terms that are used to translate the English term "equation" is *ïkkuleta*, which means half. It does not indicate the equality of two mathematical expressions. In addition, the English term "ordered pair" translated as *ťïnïd quťïr*. The Amharic equivalent conveys the presence of two numbers together. Nonetheless, the target language term means not merely to be in pair, but it also indicates a systematic arrangement of two numbers within a pair.

In Social studies: Several translation problems can be discussed in relation to Social Studies subject's terminologies. Let's look at some of them turn by turn. First, the English term "savanna grassland" is translated as *sarïma zaf mïdïr*. The Amharic term indicates the presence of trees that look like grasses, but the source language term stands for 'a grassy place sometimes with scattered trees'. Hence, the Amharic equivalent conveys a meaning that differs a bit from the source language term. Second, the English term "multilateral agreement" is translated as *sosïtïyyoš sïmïmmïnnät*. The meaning of the Amharic translation is an agreement among three bodies, but the English term shows the agreement of more than two parties. Third, the English term "trade routes" is translated as *nïgïd maʔïkäl*. The Amharic equivalent does not appropriately communicate the meaning of the source language term. A trade route is a path used by merchants, but the Amharic equivalent *nïgïd maʔïkäl* means a place that serves as a commercial center. It is the place where trade activities are carried out. Lastly, the English terms "rock hewn churches", "energy supply", "gross domestic product" and "volcanic cone" are translated as *wïqïr abyatä kïrsïttiyan, yähayïl sïrč´č´ït, yäʔamätu aťťäqalay gäbi* and *gubbïta*, respectively. In these examples, the Amharic equivalents do not fully communicate the concepts that the English terms convey.

As presented in (7), some Amharic equivalents of English terms that are used in Integrated Science, Mathematics and Social Studies textbooks do not fully communicate the concepts. Therefore, in some of the

textbooks, especially in Social Studies textbooks, English terminologies are presented in parenthesis so as to make the concepts clear.

D. Problem of getting equivalent terms: As textbook writers emphatically expressed, since several English terms have wider meanings and ideas, it is difficult to get their equivalents in Amharic, e.g.,

(8) Subjects	English Terms
Civics & Ethical education	authority, power, republic, democracy
Integrated science	atom, isotopes, quantum, schistosoma, metalloids
Mathematics	theorem, algebra, geometry, arithmetic
Social studies	Celsius, tropopause, ozone, meridian

This problem may lead to excessive borrowing from the source languages by considering it as a short cut to solve shortage of terminology.

E. Lack of indigenizing concepts: Indigenous knowledge is not given due attention in the term formation processes; because specific body of the society gives an equivalent of a term only by its preference. Even, most of the times, the task is done by individuals like translators or textbook writers. Unfortunately, during term formation, concerned bodies as well as individuals don't try to connect the concept of a new term with indigenous knowledge, and they do not discuss it with concerned bodies of the domain in which the new term belongs.

The informants also identified additional challenges in the development of Amharic terminology, including the dominance of foreign technologies and the lack of a standardized guideline for terminology formation. As one expert from the Ministry of Science and Technology noted, without local innovations in science, technology, and other domains, the influence of the languages of developed countries becomes inevitable.

Challenges of Standardizing PEATs

The following challenges have been identified in the standardization of PEATs:

A. Inconsistent use of terms: Some terms that are used in the previous curriculum materials differ from the equivalent terms presented in the well-known dictionaries like *Science and Technology Dictionary (English-Amharic)* prepared by Academy of Ethiopian Languages (1996). Besides, there is lack of uniformity in using terminologies in consecutive curriculum revisions. The main problem is that the textbook writers sometimes do not use some of the terms that are formed by others. Some of the textbook writers instead of using the terminologies that are found in

terminological works or the terminologies used in the previous curriculum materials, they use their own translations. As a result, some terms used in the previous textbooks are no longer used in the current edition, e.g.,

(9) Subjects	**Previous curriculum**	**Present curriculum**	**Gloss**
Social studies	sïrä hïwa	tahït käbabi ayyär	troposphere
Integrated science	zïqqä hïwa	maʔïkälä käbabi ayyär	stratosphere
Mathematics	maläqiya yälelläw	ïlïqobis	infinite
	haylä quťïr	rïbbi	exponent
	ťäri	laʔïlay	numerator
	qoťari	tahïtay	denominator

Altering established terms or familiar equivalents by new ones confuse teachers and would have an impact on literate parents who try to assist their kids in their studies.

Another issue is the lack of continuity in the use of certain terms across consecutive grade levels. Some terminologies disappear after being introduced at a specific grade, despite the expectation that they should be used consistently. For example, in the grade five Mathematics textbook, the term yätäqalälä waga "simplified value" is used, but in grade six, it is replaced by zïqïtäññä hisabawi qal.

In addition, more than one Amharic equivalents are sometimes used interchangeably to translate two different English terms, e.g.,

(10) *In Integrated science***:** the meanings of the terms *kïbïdät* and *gïzïfät* is not clear. Therefore, there is a tendency to use the one in place of the other. However, the correct usage is "mass" for *gïzïfät/mäťänä qus,* and "weight" for *kïbïdät*.

B. The presence of Controversial terms: There are dialect, polysemous, synonymous and quasi-synonymous terms that are used in the textbooks.

Some dialect words, which are unknown by most of the language speakers, are used, e.g.,

(11) Subjects	Dialects	Gloss
Civics & Ethical education	däbo	working in group
	wänfäl	working in group
Integrated science	bïrane	diaphragm
	käy	opaque/insulator
	zïmïbbuť	testa, seed coat
	gïrbab	testa, seed coat
	žïrät	stream
	ť älăšät	tar
Social studies	mäkälat	depletion
	qïmbïbïmma	coniferous
	qore	crater
	čïfrïg	scrub
	aqäbät	upper margin
	ǰïrät	stream
	gämägäm	highland

Even if the instruction is in mother tongue, using dialect words in the textbooks has a negative impact in students understanding. Dialects can serve as a source of terminologies in a target language, but, as much as possible, the dialect words that are known by many of the language speakers should be used as terms and their meanings should be clearly defined. Among the four subjects' textbooks, more dialect words are used as terms in Social Studies textbooks than any other subject's textbooks.

There are polysemous terms that have more than one meaning. Therefore, their intra and inter disciplinary meanings should be clearly defined. Otherwise, it will be difficult to understand their meanings clearly, e.g.,

(12) *In Integrated science and Social studies*:

Amharic terms	Gloss	
	Integrated science	**Social studies**
sïrč´č´ït	mass, diffusion	distribution
ïrkän	temperature scale, contour ploughing	terracing
ť ïmrät	combination	ratio
č´ana	compression	pressure

In Mathematics: the term *mäsmär* "line" most of the time in geometry is used to mean "straight line", but rarely it incorporates *wïsïn qäťť ïta mäsïmär* "line segment", *č'ärär* "ray" and *qäťť ïta mäsïmär*

"straight line". When a single term holds multiple meanings, it confuses students.

(13) *In Mathematics and Social studies*:

Amharic terms	**Gloss**	
	Mathematics	**Social studies**
nïdf	construction	plan
wïhdät	union	unification
č´ärär	ray	radiation

Since synonyms have similar meanings, using them interchangeably might confuse students. Besides, catching them will be additional burden on them. Among the synonymous terms that are found in the textbooks, some of them are presented below as examples:

(14) Subjects	**Synonyms**	**Gloss**
Civics & Ethical education	hʷalaqär amäläkakät, hʷalaqär astäsasäb	backward outlook
	luʔalawi hager, näs´a mängïst	sovereign
	č´ïffïn asïtäsasäb, č´ïffïn gïmït	illogical
Integrated science	hayïl, č′ana, täs´ïʔïno	compression
	mädäbäññ a s´ïbräqa, dänbawis´	regular reflection
	qïnťaťit, bïnnañ, ïnus	particle
Mathematics	bet, yäbetwaga, yäquťïr bet waga,	place value
	i-täläwawač´, yawit	constant
	lïkïkkïnnät, tägaťaminnät	congruency
Social studies	mälso dïnnäna, dagïm dïnnäna	reforestation
	männahäriya, ïnsïsat mäťäbäqqiya, ïnsïsat mäťäbäqqiyanna mäkäläya sïfra,	sanctuary
	mäkanä-hïywät, mïčču ge	habitat

As the above data indicate, a concept is represented by more than a candidate term. Even a concept is sometimes represented by three candidate terms. Thus, standardization work shall be done to nominate a widely used candidate term as a term and to determine the status of other alternatives to deprecate them. Besides, as the data shows, more synonymous candidate terms are identified from Integrated Science textbooks than any other subject.

Moreover, there are quasi-synonymous terms that have similar meanings in a specific aspect, but they have different meanings when they

are examined carefully. Thus, it is difficult to easily demark their differences, e.g.,

(15) *In Civics & Ethical education*:

Quasi-synonyms	Gloss	Quasi-synonyms	Gloss
haqäñïnnät	truthfulness	musïnna	corruption
tamañññïnnät	loyalty	gubbo	bribe
qïnïnnät	good	adïlo	partiality
i-fïthawinnät	injustice		

Since the above terms seem synonyms, some students fail to differentiate them. Therefore, their meanings should be clearly defined in the textbooks.

C. Orthographic problems: There is inconsistency in writing of direct loan terms, newly coined terms and compound terms as well as usage of Amharic alphabets that have same sounds.

There is no a guide that helps to transliterate direct loan English terms using Ethiopic script. Thus, there is a discrepancy in spelling out direct loan terms, e.g.,

(16) Subjects	Terms	Gloss
Civics & Ethical education	demokïrasi, dimokïrasi	democracy
Integrated science	magnižïyäm haydïroʔoksayïd, magnizïyäm haydïroʔoksayïd	magnesium hydroxide
	bikär, bikeri, biker, bäkeri, bekäri	beaker
	amoniyäm kïlorayïd, omoniyäm kïlorayïd	ammonium chloride

Moreover, there is variation in writing of some newly coined terms correctly, e.g.,

(17) Subject	Amharic Neoterms	Gloss
Integrated science	sïrgud mästawät, sïrgud mästäwat	concave mirror
	dïnk pïlanet, dïnkïyä pïlanet	dwarf planet
	mïťťane bïrhan, mäťťane bïrhan	iris

Inconsistency of writing some common terms is also observed, e.g.,

(18) Subjects	**Terms**	**Gloss**
Civics & Ethical education	adïlïwo, adïlïʔo, adïlo	partiality
	adïloʔawi asärar, adïl^{w}awi hag̈är, agär	favouritism country
Mathematics	wïssïn mäsmär, wïssun mäsmär	line segment
Social studies	zïrrïya, zïrriya	species

Inconsistency in writing compound terms is another problem where compound terms are found to be hyphenated, fused or written separately, e.g.,

(19) Subjects	**Compound terms**	**Gloss**
Civics & Ethical education	hïgawi sïnäsïrïʔat, hïgawi sïnä sïrïʔat	legal ethics
Integrated science	lïʔïlä hamïrawi č′ärär, lïʔïlä-hamïrawi č′ärär	ultraviolet radiation
	rïdätä kïkk, rïdätäkïkk	hypocotyl
	sïbätäqusawi mäsïk, sïbätä qusawi mäsïk	gravitational field
Mathematics	irïtuʔ wädäräññannät, i-rïtuʔ wädäräññannät	inverse proportion
	yaläʔïkkulïnnät ʔaräftä-nägär, yaläʔïkkulïnnät ʔaräftänägär	inequality
	gonnäsost, gonnä-sost	triangle
Social studies	yämälïkʔamïdïr gäs´s´ïta, yämälïkʔa mïdïr gäs´s´ïta	physical feature
	mäkanä-hïywät, mäkanä hïywät	habitat
	sïrä hïwa, sïrähïwa	troposphere

The final controversial issue concerning the writing of Amharic terminologies pertains to the disagreement among textbook authors regarding the use of Amharic alphabets that represent the same sounds (i.e., ሀ፡ሐ፡ኀ፤ ሠ፡ሰ፤ አ፡ዐ፤ ጸ፡ፀ). Some authors employ these alphabets interchangeably, while others adhere to traditional conventions rooted in Ge'ez language writing practices.

As indicated by the above data analysis, there are issues in the writing of Amharic terms. To address these problems, it is necessary to establish clear guidelines for aspects such as the spelling of direct loan and

coined terms, the writing of elements within compound terms, and the consistent use of alphabets that represent the same sounds.

D. Lack of special dictionaries and glossaries that address the current developments: There are no specialized dictionaries that users, particularly textbook writers, consistently utilize across different disciplines. Additionally, there are no standard glossaries or lists of terminologies designated for specific grade levels; consequently, the use of terminology largely depends on the preferences of textbook authors. Furthermore, as experts from the Amhara Education Bureau and the Ethiopian Standards Agency have indicated, recent developments in various fields such as agriculture, health, science, technology, and social sciences necessitate the creation of specialized dictionaries that reflect current advancements. Developing such resources would assist textbook writers in producing high-quality textbooks with accurate and consistent terminology usage.

E. Lack of professional textbooks writers: If there are sufficient professional textbook writers at the national and regional levels, many terms would have already been standardized within their respective areas or fields. Through their experience, professional textbook writers are able to identify well-established terms suitable for inclusion in textbooks, as well as ambiguous terms that may require revision.

F. Absence of national syllabus in Amharic: Given that many Amharic users reside outside the Amhara region—such as Oromia, Central Ethiopia Regional State, South Ethiopia Regional State, Benishangul-Gumuz and other areas—it is problematic that the syllabuses for various subjects, except for Civics & Ethical Education, have not been developed in Amharic at the national level. Since Amharic is the working language of the country, developing standardized syllabuses in this language at the national level facilitates effective communication across the country. Additionally, a national syllabus allows the MoE to standardize and disseminate terminology related to fundamental concepts within each subject.

Challenges of Implementing PEATs

The informants have identified the following challenges they encountered during the implementation stage:

A. Negative attitude towards mother tongue education: Many parents believe that if their children begin learning in English from the lower grades, they will be more successful in their future education, where English is the medium of instruction. This perspective is also shared by several students. Some students even perceive learning in the mother

tongue as uncivilized. Although mother tongue education plays a significant role in cognitive development, English is widely regarded as a crucial factor for academic success.

B. Lack of awareness about the importance and nature of terminologies: Some students do not recognize the importance of Amharic terminologies and therefore do not pay adequate attention to these terms. Additionally, they tend to prefer using direct loan words rather than indigenous terms that reflect their culture and are essential for understanding concepts. Some parents also lack awareness regarding the significance of Amharic terminology. Insufficient efforts have been made to inform students and parents about the importance and nature of these terminologies. Since the students are native speakers of Amharic, some of them and their parents do not consider understanding the meanings of Amharic terms as valuable knowledge. Consequently, students often memorize terms through recitation solely to pass examinations, rather than understanding their significance.

Regarding the understanding of the nature of terminologies, a key issue is that students perceive all unfamiliar terms as unrelated to their mother tongue. Some parents believe that their children are learning a different language altogether. Furthermore, students lack awareness of how terminologies are used across various disciplines. For example, they may think that the term tahït "denominator" is only relevant in Mathematics, whereas it also applies in subjects like Integrated Science—for instance, in tahïtä-käbabi ayyär "troposphere".

C. Lack of terminologies: There are no enough terminologies that satisfy the users demand. Since Amharic does not have complete terminologies like English and other developed languages, there is a push to use English.

D. The presence of difficult terms: There are many difficult (unfamiliar, direct loan or new) terms for students even sometimes for teachers and parents to understand their meanings, to pronounce, to spell out and to recall them.

There are English and Geez direct loan terms and several hybrid Geez and Amharic terms. Since English and Geez are not the mother tongues of the students, the terms are difficult for them to understand their meanings easily. Informants (i.e. students, teachers and parents) reported in the questionnaires and FGDs that various direct loan terms from English are difficult for them, e.g.,

(20) Subjects	Direct loan terms from English	Gloss
Civics & Ethical education	sivik	civic
	federal	federal
	dimokrasi	democracy
Integrated science	satälayt	satellite
	metaloyd	metalloid
	sirs	ceres
Mathematics	ǰiʔometri	geometry
	alǰäbra	algebra
Social studies	sulťanet	sultanate
	meridiyan	meridian

Moreover, the informants mentioned that terms borrowed from Geez are also particularly difficult for students, e.g.,

(21) Subjects	Direct loan terms from Geez	Gloss
Civics & Ethical education	ïsset	value
	fïthawinnät	justice
	luʔalawi	sovereign
Integrated science	zäʔakal	organism
	iskit	penis
	kärbeza	vagina
Mathematics	laʔïlay	numerator
Social studies	sïrwä mängïst	dynasty
	sïnä mïhïddar	ecology
	bäynä mängïstat	inter-governmental

In the Integrated science and Mathematics subjects, most Geez and Amharic hybrid terms are also considered as difficult terms, e.g.,

(22) Subjects	Geez and Amharic hybrid	Gloss
Integrated science	angolä gäbir	cerebellum
	märʔïy gända	artificial pond
	zäbanay sïr	dorsal root
Mathematics	sïratä-wuqïr	coordinate

In the above hybrid terms, the constituents *-gäbir*, *märʔïy-*, *zäbanay-*, and *sïratä-* are borrowed from Geez whereas the remaining parts of the terms are from Amharic.

According to the informants (especially, teachers and students) of the study, some Amharic equivalents of English terms are too complex

and difficult to understand their meanings not only for students but also for teachers, e.g.,

(23) Subjects	Amharic equivalents of English	Gloss
Civics & Ethical education	wägäntäññannät	partiality
	ťïgäññannät	dependency
Integrated science	as´ägäbrot	reaction
	gäbälo astäne	reptile
	kulkul ïtbät	parallel circuit
Mathematics	yawit	constant
	qum	term
	rïbi	exponent
Social studies	muqähïwa	thermosphere
	dïnnäna	afforestation
	sïwwur rähab	malnutrition

Furthermore, some of the respondents commented that terminologies which are borrowed from Geez, are sometimes as difficult as English terms to understand their meanings. Besides, several terminologies that are found in *Science and Technology Dictionary (English-Amharic)* prepared by Academy of Ethiopian Languages (1996), which serves as reference for the preparation of Integrated Science, Mathematics and Social Studies textbooks, are not familiar to users including several teachers. Therefore, a number of teachers prefer to use English terms rather than the Amharic equivalents given in the dictionary. Moreover, as students indicated in FGDs, since Integrated Science lessons are not supported by experiments, it is difficult for them to understand the concepts of the terms that are used in the lessons. The student-informants reported more difficult terms from the Integrated Science textbooks than any other subjects.

E. Poor textbook preparation*:* Since there is lack of experienced and adequate textbook writers, editors and consultants as well as lack of efforts to do quality works, it is difficult to have quality textbooks in all respects, including terminology use. Adequate training is not provided for those who involve in textbook preparation regarding terminology development and use. Moreover there is a gap in collaborating with all concerned sectors that work in content and language areas during the preparation of textbooks. Especially, subject teachers' participation in textbooks preparation is low.

In the Integrated Science and Mathematics textbooks, new terms are introduced; however, these textbooks lack a dedicated section for

definitions of key words at the end of each chapter, as well as a comprehensive glossary. Although definitions for key terms are provided in Civics & Ethical Education and Social Studies textbooks, these definitions are often insufficiently detailed. Additionally, important new terminologies and a glossary that could serve as a reference for students to deepen their understanding are absent. Furthermore, there is no information indicating the sources of new or unfamiliar terms, which would enhance transparency for users. The textbooks also lack adequate clear figures and illustrations across all subjects. Except for the Social Studies textbooks, none of the other textbooks provide the English equivalents of Amharic terms. Some of the terminology used is beyond the students' age and grade level, indicating a problem with terminology appropriateness. Moreover, since certain new terms do not appear consistently across textbooks for different grade levels, students may easily forget them over time.

F. Acceptability problem: Some newly created terms, which are formed by combining Geez words, Amharic and Geez words, or Amharic words alone, have not gained acceptance among users. This is primarily because these terms lack transparency and often differ in form from familiar words. When unfamiliar terms are introduced in textbooks, society, particularly parents, tends to question their origin, asking, "Are these words from Amharic, Tigrigna, or another language?" Since many parents learned using previous textbooks, they are unable to support their children effectively at home in acquiring these new terminologies. This has led to some reluctance among parents to promote the current set of terms.

Additionally, some hybrid terms combining English and Geez, such as in the Integrated Science subject, have not been widely accepted. For example, terms like kalïsyäm kïlto haydïroksayd mumut "calcium dihydroxide solution", karbon ahadu oksayd "carbon monoxide", and karbon kïltoʔoksayd "carbon dioxide" are used. Although many of the terms used in the Integrated Science, Mathematics, and Social Studies textbooks are listed in the English-Amharic Science and Technology Dictionary, they are not well known or easily understood by users.

Regrettably, many students avoid using some of new Amharic terminologies in their daily speech, perceiving them as uncivilized or inappropriate among peers. They often mock or laugh at these terms, interpreting them based on their own experiences. For instance, in Integrated Science, terms like ïnïqulïtʾi "ovary" and tïnbwa "trachea" tend

to provoke laughter among students. Some parents share similar attitudes, dismissing the terms as unimportant or unworthy of serious consideration.

Moreover, there are taboo terms, particularly in Integrated Science textbooks, that are socially unacceptable to use in the classroom during teaching and learning processes, which further hampers effective communication, e.g.,

(24) Subject	**Taboo terms**	**Gloss**
Integrated science	qoläťä q^{w}ar	epididymis
	qoläť	testes
	boyä qoläť	sperm duct

Since mentioning certain parts of the human reproductive organs is considered taboo, users, particularly students and teachers, tend to avoid naming those body parts.

G. The lack of practicality of the terminology: Students are not motivated to master Amharic terms because these terms are not integrated into the society's daily activities. In other words, teachers, curriculum experts, and other literate members of the community do not use these terminologies outside of the school environment when communicating with society. Consequently, students do not have opportunities to apply the terms they have learned within their local contexts. Instead, students study these terms solely for examination purposes.

H. Teachers' Limited Knowledge of Terminologies and Teaching Methodology: Teachers often lack the capacity to effectively handle terminological issues. This is primarily because new terms included in textbooks are not adequately introduced to teachers during curriculum cascading and validation workshops. Additionally, unqualified teachers are involved in instruction, and timely feedback on textbook evaluation reports is frequently absent. Many teachers are also teaching in language in which they are not adequately trained.

Furthermore, as students expressed during FGD, teachers do not devote sufficient attention to explaining terminologies. Students noted that some teachers introduce multiple terminologies orally within a short period, making it difficult for students to grasp and retain them. In some cases, teachers do not provide complete answers to students' questions related to terminologies and, instead, belittle students' inquiries. For example, it was observed that some teachers respond dismissively, saying, "Amharic is your native tongue! Is there anybody who misses it?"

I. Lack of Organized Instructional Media Use: Many primary schools lack essential laboratory materials, such as science kits, which results in science lessons that are predominantly theoretical. Consequently, theoretical explanations of terminologies are not reinforced through demonstrations using models or real objects, thereby limiting students' ability to internalize key concepts and memorize relevant terminologies. Additionally, the inadequate utilization of instructional materials, such as teachers' guides, radio lesson presentations, and library services, further hampers both teachers' and students' understanding of the meanings of terminologies.

J. Lack of supplementary and reference books: The scarcity of reference materials, such as supplementary books and dictionaries that clarify new terms, presents challenges for both students and teachers in comprehending these terms.

K. Low publicity of terms: Newly formed terms are not systematically communicated for the concerned bodies of the society using Mass Media (such as: television, radio, internet, magazines, newspapers), supplementary books and other means.

L. Partial Policy Implementation: The Ethiopian Education Policy permits regional states to provide preprimary and primary education (Kindergarten 1 through Grade 8) in students' mother tongues (Federal Democratic Republic Government of Ethiopia, 1994; Federal Democratic Republic of Ethiopia, 2015 E.C.). When students learn Science and Mathematics subjects up to Grade 8 in their native language, they can develop a professional proficiency in the language necessary to engage with Science and Technology topics. However, currently, Amharic is only used for Science and Technology subjects' instruction up to Grade 6. This limitation hampers the continuity and development of Amharic terminology in academic fields, thereby restricting its effective use in scientific and technological contexts.

M. Restriction of Amharic Terminologies in Primary Education: Following the completion of primary education, students are expected to transition to using English terminology instead of Amharic terms, as all subjects, except Amharic language classes, are taught in English. This shift results in a discontinuity in the use of Amharic terminology within the educational domain. Consequently, students often question the relevance of learning Amharic equivalents for English terms, perceiving it as unnecessary. Starting from grade seven, the MoI shifts entirely to English, particularly for Science and Mathematics subjects. As a result,

students tend to view learning Amharic terms as a waste of time, focusing only on memorizing them to pass from grade to grade.

N. Parents' pay less attention to Amharic terms: Many parents lack experience in supporting and motivating their children to study and retain the terminologies they have learned in school.

O. Orthographic problems: Some Amharic terminologies are challenging to spell, especially for primary school children. For example, in Integrated Science, terms such as rïkïbä bïnnañ "pollination" and maʔïsärä lens "ciliary muscles" illustrate this difficulty.

P. Issue of Linguistic Economy: Certain terms are excessively lengthy, making them inconvenient to use, e.g.,

(25) Subjects	**Long terms**	**Gloss**
Civics & Ethical education	bäsälam yähasab lïyyunnätočč̈ïn ačč̌ačč̌ïlo abïro manor	peaceful co-existence
Integrated science	sïmmet ammïč´č´i hïwas närv	sensory neuron
	bäʔayn yämayïttay däqiq zäʔakal	microorganism
Mathematics	yähulättu gonnočč rïzïmmät tägaťťami yähonu gonnä sost	isosceles triangle
	mäsmärawi yäʔïkulïnnät ʔaräftä-nägär	linear equation
Social studies	qïrritä akalatïnna qïrritä qus tämäramari	archaeologist
	qïťälä-räggäfïnna bäwänz darïčč̌a yämibäqïlu ïs´äwat	gallery riverine vegetation
	zïrïyyaw liťäfa yätäqaräbä ïnsïsa	endangered animal

The terms presented in the above example are not concise. Although they are transparent and may communicate the meaning clearly, students may encounter difficulties in recalling the terms easily and completely. This can impose an additional burden on them and make the learning process less engaging. Consequently, this may hinder the students' learning progress.

Discussions

The results of the study revealed that there are constraints that hinder the development, standardization, and implementation of PEATs. Since the aspects of term planning (i.e. development, standardization and implementation) are interconnected, they share several common features.

Consequently, the research identified general and specific challenges. General challenges are commonly shared among different language planning aspects. They are classified as managerial and conceptual constraints. Likewise, specific challenges more focus on one of term planning aspects.

The managerial challenges clearly show that currently there is no planned intervention for PEATs. As Mutasa (2006) states, lack of government political will is among the challenges of developing African languages. The finding of the study, in relation to weak government involvement in Amharic term planning is in line with Bamgbose's (1991) and Takkele's (2000) ideas that point out the negative influence of poor government initiative in terminology planning. Additionally, the absence of a dedicated institution to coordinate terminological efforts at the national level corroborates previous research by Abraham (1968) and Hailu (1971). Furthermore, the findings emphasizing the importance of stakeholder cooperation and the availability of terminology development guidelines in term planning activities are consistent with the studies of Karabacak (2009) and Alemayehu (1970 E.C).

Similarly, the study identified conceptual challenges that affect various aspects of primary education Amharic term planning. These constraints include: inadequate awareness about the role of terminologies in education, assuming that translation hides a full concept of a term, lacking research-based terminology development and lacking focus on terminology as an academic field.

In education, terminologies play an irreplaceable role in meaning communication. However, as the results of this study show, during the preparation of the four subjects' textbooks, much attention was not given to terminologies to be used in the textbooks. There is no list of standard terms that serve at specific grade level. Terms are not revised based on students' and teachers' feedback. Besides, language experts don't participate in textbooks preparation. There is a great knowledge and skill gap in conducting term planning activities. Therefore, the findings of this study are consistent with those of Bhreathnach (2011), who emphasized the role of evaluation and training in term planning. Additionally, this study aligns with Seifu's (1993) research, which underscores the significance of conducting terminological work based on previous efforts.

In addition to the above general challenges, the study also revealed the problems that are related to a specific term development aspect. Therefore, regarding primary education term development endeavours the study showed the following constraints including, lack of sustainable

efforts to develop Amharic terms, textbook writers' poor knowledge of term formation methods and principles, weak translation skills, lack of indigenizing concepts, and shortage of equivalent terms.

After the two aid-based Amharic terminology development attempts - namely the Science and Technology Terms Translation Project (Academy of Ethiopian Languages, 1996) and The Stoddart Visual Dictionary Translation Project (Corbeil, 1991) - publication of a well-organized Amharic terminologies dictionary is not observed that much in the past twenty five more years. The recent Science and Technology Amharic Terminology Project of Ethiopian Academy of Sciences is worth mentioning; but it has a limited scope and coverage of disciplines. Thus, comprehensive specialized dictionary in social science fields has not been yet prepared, and the previous works have never been revised as well. These facts strengthen the finding of this study which indicates lack of continuous organized efforts to develop Amharic terminologies. Nowadays, most of the terminological works are being done by individuals mostly to get equivalent terms when they conduct translation works to satisfy their immediate needs.

Similarly, the textbook authors involve in term development activities. However, as this study disclosed, the textbook writers lack knowledge of term formation methods and principles, as well as translation skills. If there are source language terms that don't have Amharic equivalents, the textbook writers are expected to search for equivalents from the target language. Nevertheless, as the findings of the study revealed, since the textbook writers do not have adequate knowledge and skills of term formation methods and principles as well as translation, there are excessive and superfluous borrowings, incorrect term forms, ambiguous terms, terms that convey unfamiliar meanings in the textbooks of the four subjects. Thus, the findings of this study align with Aragaw's (2009) research, which identified the presence of unnecessarily borrowed and inappropriately patterned terms in the previous curriculum of Grade 5 and 6 Integrated Science textbooks. Additionally, this study is in line with earlier research on Amharic terminologies, such as those by Abraham (1963, 1968) and Hailu (1971), which indicated extensive and indiscriminate borrowing in Amharic terminological works. Similarly, Addisu (2006), in his comparative analysis of two bilingual dictionaries, observed a higher influence of loanwords in a recent English-Amharic dictionary compared to an earlier edition. To address this issue, indigenizing the concepts underlying new terminologies may contribute

significantly. This process facilitates the identification of equivalent terms in the Amharic language.

Based on the study's findings, another significant obstacle in the development of PEATs is the shortage of equivalent terms. This is a challenge that textbook writers face while they are searching an equivalent term for a source language term using existing forms. The issue has also been highlighted in several other studies, including those by Habtemariam et al. (1979 E.C.) and Takkele (2000). However, Mulugeta (1972 E.C.) contends that the shortage of equivalent terms should not be regarded as an insurmountable problem. If the textbook writers get training, they can tackle the problem by employing different term formation methods.

Regarding the standardization of PEATs, the findings of this study, particularly the challenges related to controversial terms (i.e., dialect, polysemous, synonymous, and quasi-synonymous terms) and orthography, are largely consistent with Aragaw's (2009) research. Aragaw's study identified the presence of synonymous and polysemous terms and noted that students encounter difficulties in pronouncing certain source and target language terms in Integrated Science textbooks. Since controversial terms can hinder understanding of the lesson, term standardization is essential to differentiate these terms (Sager, 1990) and to promote consistent usage.

The study also identified inconsistent use of terms as a significant factor impeding PEAT standardization. This inconsistency results from a lack of continuity in applying a single term to represent a specific concept, which poses a challenge to establishing standardized terminology. Additionally, the shortage of recent specialized dictionaries and glossaries was identified as another constraint, leading to inconsistent term usage. This situation compels textbook authors and other stakeholders to make independent decisions regarding terminology. These findings align with the ideas presented by Yambi (2000).

Furthermore, the absence of professional textbook writers and comprehensive national syllabi in Amharic hampers the development of well-established terminology that effectively serves users, including students, teachers, and textbook authors. Besides, these constraints impede the uniform use of Amharic terminology across the country, particularly among the National Regional States and the two chartered cities where Amharic is the medium of instruction in primary education.

The study also discovered several challenges that impede the implementation of PEATs. The findings of this study are consistent with Takkele's (2000) study that pointed out the impact of restricting Amharic

in primary education and lack of terms in implementing Amharic terminologies for academic purposes. In addition, as Bamgbose (1991) confirms, in order to make serious efforts in developing terminologies of African languages, the languages should serve as MoI beyond elementary education. However, as the findings of this study showed, even if Ethiopian Education policy (Federal Democratic Republic of Ethiopia, 2015 E.C., February) permits to use mother tongue as MoI up to grade 8, Amharic is serving as MoI for Science and technology subjects (Integrated Science and Mathematics) only up to grade six. This partial implementation of the policy limits the farther use of Amharic terminologies.

The findings regarding constraints related to teaching and learning processes align with Willmon (1971), who emphasizes the importance of motivating Mathematics reading through the preparation of supplementary books and a Mathematical word list at every grade level. Additionally, textbook writers should utilize well-known specialized dictionaries. If new terms are introduced that are not yet included in existing dictionaries, writers should provide clear definitions within the textbooks. This approach ensures that students, teachers, and other users can accurately understand the terms, as they will have appropriate references to consult for their meanings (Shumbusho & Banda, 2010). However, the study showed that many teachers lack clear understanding of difficult terms. Besides, they have deficiencies in using appropriate teaching methods (particularly, instructional materials) to make clear the meanings of the terminologies for their students.

The results concerning the challenges associated with the nature of Amharic terms, which hinder their effective use, align with Aragaw (2009). Aragaw highlighted the presence of unclear terms and spelling issues in some terms found in fifth and sixth-grade previous Integrated Science textbooks. Solomon (2007) also noted the existence of terms whose meanings are difficult to understand in lower second cycle primary education Integrated Science textbooks. Additionally, Bryce (2011) confirmed the presence of difficult terms in science textbooks. Furthermore, although the number of terms lacking conciseness in the studied textbooks is limited, these terms warrant further investigation. The findings of this study support the notion that cumbersome terms are not grounded in practical language use situations where the terms are applied (Sager, 1990). Therefore, this research indicated the presence of unclear and long terms, which affects the quality of the textbooks.

Moreover, the study also identified psychological and social challenges that impede the implementation of Amharic terminologies. These challenges include, negative attitude towards mother tongue education, acceptability problems, parents pay less attention towards Amharic terms and the lack of practicality of the terminology.

The findings that pointed out parents and students negative attitude towards mother tongue education, to some extent, consistent with Aragaw (2009), who suggested that users' negative attitudes toward Integrated Science Amharic terms may lead to a reluctance to learn in that language. Additionally, the current research findings concerning parents align with Mutasa's (2006) assertion that parents' perceptions and attitudes can hinder the use of the mother tongue in education. Negative attitude of parents and students toward mother tongue education discourage students to acquire and use Amharic terms in their daily lives.

Finally, the study also revealed as students and teachers do not feel easy to use some of the terminologies (particularly: unfamiliar, hybrid and taboo terms) in the classroom as well as in their day to day communication. The parents also consider some of these terms as unusual. Therefore, some people laugh when they hear the terms. Unfortunately, this limited the practicality of the terms to convey meanings in different settings where the terms are required. Accordingly, users prefer to use the English equivalents. Hence, the results of the present study regarding the types of terms that are not accepted by students, teachers, and parents broadly corroborate the findings of Aragaw (2009), who stated that ill-patterned terms, taboo words, opaque terms, and borrowed terms from local languages such as Geez in Grades 5 and 6 Integrated Science are not acceptable to students and teachers. In addition, Mwansoko (1993) found that ambiguous terms and terms that differ in form from the target language are also likely to be unacceptable to potential users.

Conclusions

The findings of the present study indicate that several challenges may impact the development, standardization, and implementation of Amharic terminology. The primary challenges include limited government interest in developing Amharic, the absence of an institution dedicated to coordinating Amharic terminological efforts at the national level, insufficient awareness of the role of terminology in the teaching and learning process, lack of collaboration among stakeholders, underdevelopment of terminology as a discipline within the country, and engagement in terminological activities without adequate research.

Additionally, specific challenges are associated with each aspect of term planning. Notably, the challenges of terminology development include the lack of sustained efforts to develop Amharic terminologies, limited knowledge and skills in term formation methods and principles, inadequate translation abilities, insufficient capacity to indigenize concepts, and the dominance of foreign technologies.

Furthermore, challenges such as the shortage of recent specialized dictionaries and glossaries, inconsistent use of terms, presence of controversial terms, and orthographic issues are likely to influence the standardization process of Amharic terminology.

Regarding terminology implementation, several obstacles are evident. These include negative attitudes among some stakeholders towards mother tongue education, weak enforcement of education policies, restrictions on the use of Amharic terminologies in primary education, limited publicity of terms, the presence of complex or heavy terms, low acceptability of new terms, teachers' insufficient subject matter knowledge and teaching methodologies, and a shortage of supplementary and reference materials.

In conclusion, addressing these challenges across the various aspects of term planning, namely development, standardization, and implementation, is essential to establish appropriate and widely accepted terminologies. Such efforts will enable textbook authors to produce effective textbooks, thereby enhancing the quality of mother tongue primary education.

Recommendations

Based on the conclusions, the following recommendations are proposed:

- The Federal Government of Ethiopia should develop a comprehensive language policy that promotes planned development of indigenous languages, with particular emphasis on Amharic as the working language.
- The Amhara National Regional State (ANRS) should provide late-exit, quality primary education in Amharic. Or, it may introduce bilingual education at grades 7 and 8 to teach General Science, Mathematics and other subjects. These approaches can help prevent language domain loss and facilitate the indigenization of science and technology. Besides, teachers should be trained in the language of instruction.
- The Federal Government of Ethiopia, in collaboration with ANRS, other regional states, and the two chartered cities that utilize Amharic as a working language, should establish an institution dedicated to the development of Amharic language terminology.

- The Ministry of Education (MoE) should take the lead in coordinating regional states that provide primary education in Amharic, with the aim of developing harmonized subject syllabi across regions. This coordination is essential to ensure consistency in the use of terminology and to prevent unnecessary duplication or variation that may hinder effective teaching and learning. To facilitate this process, the MoE may delegate the coordination role to the ANRS, given its extensive experience in delivering primary education in Amharic and its institutional capacity to support such an initiative.
- The ANRS Education Bureau should engage in research on Amharic terminological issues in education, disseminate terminological resources such as dictionaries and glossaries, and prepare standardized term lists for each primary education grade level.
- The ANRS should provide training and guidelines for textbook authors on key issues that enable them to produce high-quality textbooks, including strategies for addressing terminology challenges before they begin writing. Moreover, experienced textbook writers, language experts and subject teachers should be involved at various stages of textbook development.
- Textbook writers are required to develop their textbooks in accordance with the guidelines provided by the ANRS Education Bureau. Additionally, they should utilize well-established terms from previous curriculum materials (such as syllabi, textbooks and teachers' guide), relevant and recent specialized and general dictionaries, and glossaries. If an equivalent for a new terminology cannot be found from the stated sources, they may coin a new term or revise an existing one, following appropriate term formation methods and principles.
- Teachers need to be familiar with subject-specific terminologies and should utilize appropriate instructional materials to teach these terms effectively. Practical methods such as experiments and demonstrations are particularly effective for teaching integrated science terminologies. Teachers should also participate in awareness activities to foster support among students and parents for mother tongue education.
- Mass media outlets can play a vital role in disseminating new terms, promoting their use, and raising awareness about the importance of mother tongue education in the social, economic, and political development of Ethiopia.

  These recommendations aim to strengthen the role of Amharic in education and national development.

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Symbols

The following symbols were used to transliterate Amharic terminologies, particularly in the data analysis section:

Vowels

Vowel	Example	Gloss
ä = ä	ጨረር = č´ärär	ray
ኡ = u	ሉል = lul	globe
ኢ= i	ሚዛን = mizan	balance
ኣ = a	ዋጋ = waga	value
ኤ = e	ዜጋ = zega	citizen
እ = ï	ህዝብ = hïzb	people
ኦ = o	ሆድ = hod	stomach

Consonants and other symbols

Consonants

Consonant	Example	Gloss
š = š	ሽፋን = šïfan	coverage
ቀ = q	ቀሪ = qäri	remainder
ቸ = č	ችግር = čïggïr	problem
ኝ = ñ	ብናኝ = bïnnañ	particle
ž = ž	ገዥ = gäž	ruler
ይ = y	የብስ = yäbs	land
ዕ = ʔ	ዓለም = ʔaläm	world
ጅ = ǰ	ጀግና = ǰägna	hero
ጥ = t’	ጡንቻ = t’unča	muscle
ጭ = č´	ጭቆና = č´ïqona	oppression
ጵ = p´	ጳጳስ = p´ap´as	pope
ጽ = s´	ጸጥታ = s´ät’t’ïta	security

Other symbols

Complex sounds

Complex	Example	Gloss
ሏ = lʷa	ለሙትሏታ = lotlʷatta	withered
ሟ = mʷa	ሟሟ = mʷammʷa	dissolved
ሯ = rʷa	ሯጭ = rʷač´	runner

ቋ = qʷa	ቋንቋ = qʷanqʷa	language
ቧ = bʷa	ቧንቧ = bʷanbʷa	pipe
ኗ = nʷa	ኗሪ = nʷari	inhabitant
ኳ= kʷa	ኳተነ = kʷattänä	exhausted
ዟ = zʷa	ዟሪ = zʷari	vagabond
ጓ = gʷa	ጓል = gʷal	large
ጧ = tʼʷa	ጧት = tʼʷat	morning

All the above symbols, except ʔ, are adopted from Journal of Ethiopian Studies (XLVIII, pp. 126-127, 2015). Besides, the symbol ʔ is taken from Takkele (2000). Since these linguistic symbols are serving in domestic well known reputable journal, they are expected to be familiar with readers.

Abbreviations and Acronyms

ANRS	Amhara National Regional State
CTT	Communicative Theory of Terminology
FGD	Focus Group Discussion
MoE	Ministry of Education
MoI	Medium of Instruction
PEAT	Primary Education Amharic Terminologies
UNESCO	United Nations Educational, Scientific and Cultural Organization