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The Implementation Fidelity, Contributions, and Challenges of Augmented Reality in Some Selected Pre-Primary Schools of Addis Ababa City Administration

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Abstract

This study aimed to investigate preprimary school teachers' perspectives on the fidelity, contributions, and challenges of Augmented Reality and 3D visualization in the preprimary education program. Quantitative and qualitative approaches with concurrent triangulation designs were employed to address the purpose of the study. The participants of the study were seventeen preprimary education teachers, two preprimary education principals, one Augmented Reality designer, and four staff members from Plan International, selected by employing purposive sampling techniques. A survey questionnaire, interview, focus group discussion, and document analysis were used to collect the data. Both quantitative (mean and standard deviation) and qualitative (thematic analysis) techniques were used to analyze the data. Findings revealed that Augmented Reality application practice in exploration, installation, and implementation stages were well addressed through the project activities. Preprimary education teachers believed that augmented reality had several contributions, including improving children's motivation, interest, memory, active involvement, fine motor skill, social interaction, and digital literacy skills. There are a variety of difficulties that affect how Augmented Reality is implemented. The application has several hurdles including limitation in the pedagogy, misalignment with the curriculum, inadequate preparation of the Augmented Reality for KG2, and challenges with using Augmented Reality in large classes. Finally, preprimary education opts to consider emergent ideas, outcomes, and methods. Thus, the application of Augmented Reality needs to reconsider how it can foster curiosity, imagination, reflection, and creativity in the learning process.

Keywords: Augmented Reality, 3D Visualization, contributions, fidelity, challenges, preprimary education

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Introduction

Mobile technology contributes positively in education (Radosavljevic et al., 2020) and Augmented Reality (hereinafter-AR) along with Virtual Reality (VR) and Mixed Reality (MR) are considered to be key educational technologies over the next decade (Becker et al., 2018). AR is one of the new sciences (technologies) with excellent reflection in the field of education (Jaiswal et al., 2021) and pedagogical tools that have a pervasive role in the process of teaching-learning. AR technology has been recognized from educational sciences expertise as one of the most promising technologies that will be adopted by educators the next decade and along with VR have the potential to be a standard tool in educational sciences.

The power of augmented reality to meet the need for educational technology to be interactive and attractive for preschool children (Aladin et al., 2020) has attracted the attention of researchers to preschool children in recent years (Gecu-Parmaksiz & Delialioğlu, 2020; Mowafi & Abumuhfouz, 2021; Pan et al., 2021; Preka & Rangoussi, 2019; Redondo et al., 2020; Zhu et al., 2020). According to constructivism theory, it can be said that augmented reality applications support children who actively participate to gain confidence and motivation by providing an innovative and interesting environment for learning (Rasalingam et al., 2014; Sommerauer & Müller, 2018).

Studies indicate that AR enhances problem solving skills (Hassan et al., 2022); motivation (Ozdamli & Karagozlu, 2018), attention (Tuli & Mantri, 2021), and it provides more authentic learning experiences and creative thinking skills (Ivanova & Ivanov, 2011) through rich interaction. Furthermore, the use of AR in the classroom increases students' motivation and improves their concentration and thus teaches more

(Sobral & Menezes, 2012). Masmuzidin and Aziz (2018), in their study examining early childhood studies on augmented reality, revealed that this application mostly developed motivation. Similarly, Bacca et al. (2014) stated that studies on augmented reality provide the most learning outcomes and motivation. Children's interactions with content material, peer-to-peer interaction, child-teacher interaction and real-time feedback provided by AR make it easier for children to focus better (Madanipour & Cohrssen, 2020).

Moreover, applications with augmented reality technology improve the skills of knowing, exploring, perceiving and expressing emotions and artistic expression of the environment (Kelpšienė, 2020). Thus, it can make learning more effective, fast and fun (Roopa et al., 2021). AR provides a natural environment where children can both interact with virtual manipulatives and relate them to the real physical world (Gecu-Parmaksiz & Delialioğlu, 2020). This natural link has the potential to support skills such as attention and spatial cognition. In addition, AR attracts the attention of children as it enables them to manipulate and interact with objects (Chen & Chan, 2019). Augmented reality applications that provide attention, interest and motivation enable children to learn words and keep them in memory (Santos et al., 2016). Likewise Baragash et al. (2022) found that AR was useful for teaching literacy skills and efficient for fostering children's arithmetic skills. In addition, using technology improves children' focus and attentiveness on their tasks (Hassan et al., 2022).

Despite the advantages of AR in pre-primary education, it is important to consider a developmentally appropriate practice as a significant factor while working on design and development of children's AR applications (Tuli & Mantri, 2020). It is also essential to consider age and culture-appropriate design (Radu & MacIntyre,

2012). On the other hand, studies have revealed that usability issues have been reported based on the fact that children found AR complicated and difficult to use, faced technical problems while using an AR application due to device characteristics such as a small size screen, network speed, or battery capacity (Tuli & Mantri, 2020). Other studies describe as a drawback of using AR technology the children distraction and cognitive overload (Kelpšienė, 2020). In the case of preprimary schools with large classes, there are challenges with the way the classrooms are set up. Another study also showed that teachers who have received training in AR are better at integrating and practicing science activities (Roopa et al., 2021). In Ethiopia, little is known about the contribution of AR technology to teaching practice and learning outcomes in preprimary education, and its applications in early childhood education remain limited. Thus, this study attempted to unlock the potential fidelity, contributions, and challenges of AR on the children's learning process and outcomes in preprimary education

Statement of the Problem

Research revealed the preferences of preschoolers to augmented reality over the traditional one. Educators also considered augmented reality as innovative and beneficial teaching approach in preschool program (Rapti et al., 2023). Despite its long history of use in university and lower grades, the application of this technology in preprimary education is limited (Aydoğdu & Kelpšiene, 2021). Although augmented reality has many benefits, its use in educational settings is not widespread (Dobrovská & Vaněček, 2021). Studies have also shown that the application of augmented reality enhances early literacy skills (Masmuzidin & Aziz, 2018) and

foreign language teaching skills (Fan et al., 2020) in preprimary education. In addition, augmented reality assists children in enhancing the learning process (Godoy Jr., 2020). While there are not many augmented reality practices in preprimary education programs in Ethiopia, the technology is recommended as an additional pedagogy because it can engage children's senses, capture their attention, and create a fun environment.

The use of this application in education has gained popularity and has been linked to improved learning outcomes across a variety of academic disciplines. It permits the use of 3D objects, texts, photos, videos, and animations to be used simultaneously, and it can be utilized on devices such as desktops, laptops, portable devices, and smartphones (e.g., Kirner et al., 2012). Numerous studies attest to the value of augmented reality as a pedagogical tool and its educational benefits in preschool programs. However, no research has been done in Ethiopia to assess the fidelity, contributions and challenges of AR application in pre-primary education program in Ethiopia.

Moreover, studying AR contributes to the field of preprimary education, providing insights into innovative teaching methods that can enhance learning experiences for young children. This research offers a deeper understanding of how AR and 3D visualization align with preprimary education pedagogy, shedding light on effective strategies for integrating technology into early childhood education. The finding has theoretical values, including informing educational theories related to constructivist learning theory, cognitive development, learning styles, and engagement. They offer theoretical frameworks for utilizing AR and 3D visualization in educational settings. Regarding its practical values, the AR findings support

children to personalize learning, enhance hand-on experiences, address diverse styles of learning, motivation, interactive and visual learning. In addition, understanding the fidelity, contributions, and challenges of AR and 3D visualization can lead to the development of tailored educational content that enhances children's engagement, comprehension, and retention.

In order to better understand how augmented reality is practiced in preprimary education, this study looked to assess teachers' views, because teachers in preprimary education programs tend to examine an issue from different perspectives, have long and multifaceted experiences of the education system, and could identify factors that might not initially be taken into account. By conducting this study in Yekabado and *Miazia* 23 preprimary schools in Addis Ababa city administration, Plan International Organization (PIO) and its partners aimed to contribute to the ongoing efforts to improve the quality of early childhood education in the region and explore innovative approaches to enhance children's learning experiences. Therefore, this study aimed to assessing augmented reality applications fidelity, contributions, and challenges in some selected pre-primary schools of Addis Ababa City Administration.

Objectives of the Study

The present study attempts to:

- Investigate the fidelity of augmented reality (AR) and 3D visualization in the preschool education program
- Examine the contributions of AR to enhancing children's learning outcomes.
- Analyze the challenges of augmented reality in preschool education program.

Research Questions

This research is aimed to address the following questions:

- What is the fidelity of augmented reality (AR) and 3D visualization in the preschool education program?
- What are the contributions of AR to enhancing children's learning outcomes?
- What are the factors that affect the proper practices of AR in the preschool education?

Operational Definitions

- **Augmented reality:** refers a technology that combines computer-generated elements with the real world images and videos of preprimary education contents, allowing children to get hands-on learning experiences.
- **Fidelity:** expresses the way the intervention protocol of AR is effectively implemented as intended.
- **Contributions:** assesses the use of AR in enhancing children's learning outcomes.
- **Challenges**: defines and assesses the factors that affect the proper implementation of AR in the preprimary education program

Methods

Study Area

The study was conducted in Addis Ababa city administration, specifically in two government preprimary schools, *Yekabado* and *Miazia* 23, were purposively selected as the study sites. These schools were chosen as they were part of a pilot project initiated by Plan International Organization (PIO) to introduce and evaluate

the use of AR technology in enhancing children's learning outcomes. Both *Yekabado* and *Miazia* 23 preprimary schools catered to a diverse group of children from different socio-economic backgrounds, providing an opportunity to evaluate the intervention's effectiveness across various demographics. PIO, a renowned non-governmental organization (NGO) working in child rights, education and development, partnered with the Addis Ababa City Administration Education Office to provide the necessary support and resources for the implementation of the intervention. The intervention aimed to enhance the learning experience of the preprimary school children by incorporating AR and 3D visualization into their curriculum.

The intervention involved the use of AR technology, which overlays digital content onto the real world, and 3D visualization, which enables the children to interact with three-dimensional objects and scenarios. These technologies were integrated into various educational activities, including literacy, science and mathematics skills. To ensure effective implementation, the teachers and staff at *Yekabado* and *Miazia* 23 preprimary schools received training and support from PIO. This training equipped them with the necessary skills and knowledge to integrate AR and 3D visualization into their teaching methodologies effectively. At the end of the intervention, research was conducted to determine the effectiveness of the AR and 3D visualization intervention.

Research Design

The study conducted was based on a mixed-method research design, which combined both quantitative and qualitative approaches. The concurrent triangulation design ensured that both quantitative and qualitative data were collected

simultaneously and analyzed separately. By comparing and contrasting the findings from both methods, researchers identify convergence or divergence in the results, enabling a more comprehensive and nuanced interpretation of the research topic. Triangulation of data from different sources also enhances the validity and reliability of the study, as multiple perspectives and sources of evidence are considered.

Participants

The selection of participants for the study was done through purposive sampling. Seventeen (17) teachers who had received training on AR application in the classroom were included in the study. These teachers were chosen based on their experience and willingness to participate in the study. Additionally, two (2) preprimary school principals, who were responsible for overseeing the implementation of AR in their respective schools, were selected as participants. Furthermore, one (1) AR designer, who played a crucial role in developing and customizing the AR applications for the pre-primary education, was included in the study. The AR designer had expertise in creating interactive and engaging content using AR technology. In addition, four (4) staff members that initiated and supported the AR project from PIO were also selected as participants.

Instruments

Data for the study was collected using a combination of survey questionnaires, in-depth interviews, Focus Group Discussions (FGD), and document analysis. Items for all these instruments were developed based on background, statement of the problem, objectives, related literature, and AR documents. Some details about the instruments are provided below.

A survey questionnaire: The survey questionnaire was designed to gather quantitative data and was developed based on key variables related to contributions and challenges of AR. Teachers responded to 24 items with a 5-point Likert scale to gauge their attitudes towards the importance of AR in children's memory, motivation, active engagement, social interaction, digital literacy, and fine motor skill development. The survey includes 3 items to assess the importance of children's memory, 5 items to assess the importance of children's motivation, 6 items to assess the value of active engagement, 5 items to assess the value of social interaction, 3 items to assess the value of digital literacy, and 2 items to assess the value of the development of fine motor skills. Seven criteria were used to gauge the difficulties posed by AR technology in pre-primary education.

In-depth interviews: Two preprimary school principals, four experts from PIO, and one AR designer were interviewed bout fidelity, contributions, and challenges of AR and 3D visualization.

Focus group discussions: FGDs were conducted with teachers of the two preschools. Two FGDs were conducted, one at *Yekabado* preprimary school and one at Miazia preprimary school, with 7 and 8 teachers, respectively. The FGDs were believed to provide insights into the fidelity, contributions, and challenges of AR and 3D visualization.

Document analysis: The relevance, level of linguistic difficulty, and cultural appropriateness of the AR guidelines were all evaluated using document analysis. In addition, fidelity of AR was also reviewed and evaluated from AR report document.

The items for all instruments were carefully prepared to ensure their alignment with the study objectives, rationale, and significance. Relevant sources were consulted

during the item preparation process. To ensure the validity and reliability of the data, several steps were taken. Firstly, the reliability of the survey questionnaire was assessed using Cronbach's alpha, a commonly used measure of internal consistency (see Table 1 below). To establish content validity, a panel of experts was consulted. These experts included researchers, staff members from the PIO, and AR designers. The selection of experts was based on specific guidelines, which included their experience as academicians and familiarity with the thematic domains and concepts related to evidence-based practice in AR in preprimary education. Each expert was provided with a copy of the instrument, and asked to review it. The reviewers were requested to identify any deficiencies and provide recommendations or suggestions to improve sentence structure, clarity, and conciseness. The experts' feedback was then incorporated into the instrument by the investigators, ensuring that a significant number of items received the desired degree of ratings from the content experts. The review process also involved making editorial corrections, such as ensuring language consistency and clarity.

The researchers transcribed all the qualitative data to ensure that no critical information provided by the sources was missed. This transcription process facilitated a thorough analysis of the qualitative data. Overall, the data collection process involved a comprehensive approach that incorporated both quantitative and qualitative methods. Steps were taken to establish the validity and reliability of the instruments, including consultation with content experts and the use of appropriate statistical measures. The combination of survey questionnaires, in-depth interviews, focus group discussions, and document analysis allowed for a thorough examination of the research objectives and provided a robust data set for analysis.

Table 1

Reliability of AR Contributions and Challenges

Dimension	Sub-variable	Number of Items	Crobach's Alpha
Contributions of AR	Memory	3	.89
	Motivation	5	.90
	Active Engagement	6	.83
	Social Interaction	5	.87
	Digital Literacy Skill	3	.78
	Fine Motor Skill	2	.72
Challenges		7	.81

Procedures

Before the implementation, consent letters to conduct the study were submitted to the two preprimary schools. After getting the appropriate consent to conduct the study, different steps were carried out to execute the data collection procedures of the study. Information about the number of teachers, principals, AR designer, and PIO staffs were collected from the two schools. Before the data collection team travelled to the research sites, the necessary preparations had been made by the core research team members. The preparations included finalizing data collection instruments, organizing logistics necessary to travel to the two schools, securing support letters from Addis Ababa City Administration Education Office, searching for and recruiting qualified and experienced data collectors who were well acquainted with the local context of the study. In all the two schools, prior communication had been made with relevant government offices particularly, Addis Ababa Bureau of Education to obtain their support during the field data collection process. Accordingly, the field data collection teams enjoyed extended support of

government offices. The first field work day was devoted to training data collectors on the data collection instruments, orienting them about the objectives of the study and PIO's child protection policies, ethical considerations, and standards to be followed before-during- and after FGD sessions with different types of participants. In collaboration with offices of Addis Ababa Bureau of Education, gate keepers were identified and contacted to guide the field data collection team at each of the study sites.

Data Analysis

To analyze the quantitative data, various statistical measures were employed. Descriptive statistics involving mean and standard deviation (SD) were utilized to analyze the quantitative data, and IBM SPSS Statistics 25 was employed to assist in the data analysis. Moving on to the analysis of qualitative data, researchers employed thematic analysis. Thematic analysis is a qualitative research method used to identify, analyze, and interpret patterns, themes, and meanings within textual data. It involves systematically coding and categorizing the data to identify recurring themes and patterns that emerge from the responses. Researchers read and reread the qualitative data to immerse themselves in the content and gain a comprehensive understanding of the participants' perspectives. Throughout the thematic analysis process, researchers ensured transparency and rigor by discussing and validating their interpretations with the research team. This iterative process allowed for the refinement and revision of the identified themes, ensuring the accuracy and reliability of the findings.

Ethical Considerations

The study complied with PIO Child Protection Policy, Research Policy and Standards, and Guideline for Consulting with Children and Young People with Disabilities. The rights and dignity of study participants were fully respected and protected by applying all required research ethics including securing consent from each participant. Signed consents were secured from many of the participants. When signed consents were not possible, recorded oral consents were secured. All field staff members signed PIO Child Rights Protection Policy Acknowledgement Form.

Results

Teacher's Demographic Characteristics

Table 2

Summarized Teacher's Demographic Characteristics (N= 17)

No.	Variables	Categories	Frequency	Percent
1	Sex	Male	3	17.6
		Female	14	82.4
2	Age	25 – 30	6	35.4
		31 – 36	8	47.2
		Above 37	3	17.4
3	Work experience	4 – 9 years	13	76.4
		10 – 13 years	4	23.6
4	Teachers qualification	Diploma	16	94.1
		Degree	1	5.9

Table 2 shows that 82.4% of teachers were female and the remaining 17.6% were male. With regard to age, 47.2% were between the age of 31-36, 35.4% were between the age of 25-30 and the remaining 17.4% were above 37. With respect to

teacher qualification, of the total 17 teachers, 16 (94.1%) were diploma holder and only 1 (5.9%) had first degree. Looking at the data on their work experience, 76.4% of teachers had 4 to 9 years and 23.6% had 10 to 13 years of experience. Additionally, one male and one female school principals 1 female and 3 male PIO and 1 male AR designer participated in the study.

Teacher's view towards the fidelity of Augment Reality and 3D Visualization

Exploration and Installation Stage of Augment Reality and 3D Visualization

The utilization of AR and 3D visualization in pre-primary schools has undergone exploration and installation stages, uncovering significant aspects. Initially, the selection process aimed to identify children facing challenges in reading, writing, and math skills for the AR intervention. Although the initial plan was altered, the teachers and PIO reached an agreement to provide AR for all children. The selection was carried out by the principals of *Miazia* and *Yekabado* preprimary schools in consultation with teachers. To ensure successful implementation, a four-day training program was conducted for the selected teachers, KG coordinators, special needs experts, ICT professionals, and Woreda experts or supervisors involved in the AR intervention. The training covered various AR topics, pre-primary education issues, and relevant materials, equipping stakeholders with the necessary knowledge and skills. This is supported by the following quotes, which indicate the exploration and installation of AR with a focus on fidelity. From *Miazia* and *Yekabado* Preschool, FGD participants' teachers described on the fidelity situation as, *"*First, group of children were selected from our preschools, and then beneficiaries were identified and a discussion was held on the actual implementation of AR."

The *Miazia* preschool principal further described the situation:

> *The AR program was discussed. Groups to be included in the AR intervention were chosen. Children with writing, reading, and counting difficulties (connected to disabilities) were chosen from two parts. Twenty children from two KG1 sections were among the forty children.*

The *Yekabado* preschool principal further described the situation *as* "The KG1 children were selected from fourteen sections, and forty of them were found to have reading, writing, and math skills problems across the board. Teachers participated in the selection of the children."

In the FGD participants from PIO described on the fidelity situation as follows:

> *We picked the beneficiaries (as stated in the proposal). We have a connection to the preschools. We chose the special needs children; the schools selected the children. PIO supports the two schools. We invested in the schools; the leaders of the two schools were committed to carrying out new initiatives. We used our framework; it fitted with our innovation; the process took a long time, and the contents were prepared from curricula.*

In addition, the activities involved in the AR installation stage were clearly outlined in the quote presented below. Participants from *Yekabado* preschool mentioned the following activities:

> *Teachers were trained and AR tools were purchased. We received training on augmented reality and relevant pre-primary education issues. The session lasted for four days, 4 days training.*
>
> *We trained Teachers (8), KG coordinators (2), Special need experts (2), ICT (2) and Woreda experts or supervisors (2)*

Participants from *Miazia* preschool similarly shared about this situation:

> *All required materials were bought. AR technology was prepared. Curricular content was installed in the AR; teachers received training on how to utilize AR, and AR resources were relevant.*
>
> *Four days of training were provided, covering AR topics and other pertinent materials.*

The study has also unfolded the support provided by PIO to the two schools. The organization invested in the schools and aligned their innovation with its framework. The content used in the AR intervention was derived from curricula, ensuring its relevance and seamless integration into the educational context. Furthermore, the dedication and support demonstrated by the principals of the two schools in implementing new initiatives and conducting the AR intervention are commendable. Their commitment plays a pivotal role in the successful integration of AR and 3D visualization in pre-primary education.

Full Implementation of AR

Participants reported that a practice worksheet resembling their existing teaching methods was available, and they mentioned that AR was made available to

all children, who treated it like a game. However, they emphasized that their teaching strategy was distinct from AR, as they focused on the curriculum's content organization. The principal of *Miazia* expressed that they didn't face challenges during practice, and children were learning through observation, touch, and letter connections. The principal of *Yekabado* stated that two days were allocated for AR implementation, with a specific focus on its relevance to children with special needs and the use of English as the language of instruction. The PIO staff and AR designer highlighted several key features of the project, such as the approval of AR design, its digitalized content, and the project's pilot nature. They also mentioned starting the project with some skepticism but acknowledged the potential benefits of technology-supported learning. The qualitative results from the quote below provide insights into the implementation stage of AR in the context of the study.

FGD participants from *Yekabado* preschool stated the following:

> *A practice worksheet is available; it resembles what we are doing and teaching. Two days have been set aside for AR, and we discuss the practice's relevance to children with special needs. It urges using English as a language of instruction.*

FGD participants from *Miazia* preschool detailed the following:

> *We made it available to all children; they treat it like a game; it happens twice a week, and we need time to carry out our own strategy. We teach them in accordance with the curriculum's (content), not AR. Our strategy is distinct from AR's system, and we base our instruction on the curriculum's content organization. We don't face challenges in*

> *the practice; children are learning by observing and touching the items. Children learn by connecting letters.*

FGD participants from PIO and AR designer described on the situation as follows:

> *The following are some of the project's key features: AR was not tested in the preschool program so far, but it was tried in grade two; AR design is approved; this is considered as a pilot work for Plan International Organization; it is a one year and seven month project; AR contents are digitalized; we started it with some skepticism because we do not know the future; and learning with the support of technology.*

Adherence of Augment Reality and 3D Visualization

The research unmasked the AR adherence, including quantity, quality, ecological, and system adherence. In the *Yekabado* FGD teachers, the AR project followed a one-year plan with two scheduled phases, covering 64 sessions per year. However, there were no revisions to incorporate new concepts, and the AR did not address all contents. The ecological adherence was lacking as self-correction, self-feedback, self-reflection, and proactive actions were not organized by the systems. In the *Miazia* FGD with 8 participants, no specific information regarding adherence was mentioned, except for the identification of shortcomings without taking necessary action. The Principal of *Miazia* mentioned completing the planned 64 AR sessions over a year, but there were implementation gaps and no support system in place. The principal of *Yekabado* highlighted the AR and 3D visualization training provided, but

the content was deemed unsuitable for children, and assistance was lacking to address constraints. The PIO staff and AR designer mentioned that the AR project was a pilot effort, complementing their innovative style, but progress monitoring was absent, and improvements were made based on teacher feedback.

The initial implementation of AR is detailed in the quote below. An FGD participant teacher from *Yekabado* preschool stated as follows:

> *According to the AR project's plan, the intervention lasted a year and was divided into two scheduled phases. The AR project included 64 sessions per year, or 32 sessions per semester (quantity adherence). No revisions were made to incorporate new concepts, and AR did not cover all content areas (ecological adherence). Systems for organizing self-correction, self-feedback, self-reflection, and proactive actions to enhance ongoing AR practices were not established (system adherence). However, experts in AR provided training, and ECCE experts were involved (quantity adherence of AR).*

Moreover, the participant teachers from *Miazia* preschool stated the following:

> *We began with 40 children (quantity adherence), and they are prepared to assist us. We identified the shortcomings but did not take action (quantity adherence of AR).*

Details of AR implementations and challenges are also described by the participants. *Miazia* preschool principal described it as follows.

> *The AR project's strategy called for two time periods and 64 AR sessions (32 sessions in a semester), which were all completed over the*

> *intervention's one-year duration (quantitative adherence). Concerning implementation gaps, they enquired about availability to help us (ecological adherence). No system was developed to provide support (system adherence), but they are familiar with the AR application, and AR professionals led the training. Experts from ECCE were involved (quality adherence).*

According to *Yekabado* preschool Principal:

> *AR and 3D visualization training were offered, and these technologies have produced platforms that link letters to actual items. It is a suitable education (quantitative adherence); however, the content is not age-appropriate for children (ecological adherence). Despite their request for assistance, there was no way to address these constraints (system adherence), and they lack familiarity with the government curriculum (quality adherence).*

Participants from PIO and AR designer also stipulated the following:

> *It is accepted as an AR design, is a one-year, seven-month project, and is considered a pilot effort for Plan International Organization (quantity adherence). Since we have observed what other nations go through, we apply our framework. It complements our innovative style (ecological adherence). We are documenting the children this year, but we did not do this last year. We are also correcting sounds and certain AR items based on teacher feedback. No progress was monitored*

(system adherence), and contents are prepared from the curriculum (qualitative adherence).

Teacher's perspective on the contributions of AR and 3D visualization's in enhancing children's learning outcomes

Enhance Children's Memory Skills

Table 3

Enhance Children's Memory Skills (n=17)

	Items	Agree to Strongly agree	Undecided	Disagree to Strongly disagree	M	SD
Value to children's memory	Visualize for long period of time	16		1	4.41	.79
	Remembering learning organization	17			4.58	.50
Total					**4.5**	**.59**

The importance of the AR application on children's memories is shown in Table 3 above. The mean score and standard deviation of the items are displayed in the table. The average rating for memory items is M=4.5 (SD=.59), indicating that pre-primary instructors are closer to the higher rating level in terms of the importance of AR in children's memories. The teachers were also asked to rate the influence of AR-based applications on children's memory, as shown in Table 3. Nearly all of the teachers (99%) held a strong belief on the importance of AR for children's memory

development. For item 1, only one instructor indicated that they disagree. The findings indicated that utilizing AR-based applications improved children' memory and visualization skills.

Enhance Children's Interest and Motivation

Table 4

Enhance Children's Interest and Motivation (n=17)

Variable	Items	Agree to Strongly agree	Undecided	Disagree to Strongly disagree	M	SD
Value to children's motivation	Happiness	17			4.70	.46
	Increase children interest in learning	17			4.64	.49
	Increase children interest to show things	17			4.41	.50
	Increase children motivation to learning	17			4.58	.50
	Initiate children learning interest	17			4.52	.51
Total					**4.57**	**.49**

According to the study's mean value (M=4.57) for children's motivation, AR-based applications were found to improve children's interest in learning activities. A deeper analysis of the five motivation items shows that AR-based learning activities fostered higher levels of learning interest, initiation, and satisfaction of children.

Instill Children's Active Engagement

Table 5

Instill Children's Active Engagement (n=17)

Variable	Items	Agree to Strongly agree	Undecided	Disagree to Strongly disagree	M	SD
Value to enhance children's active engagement	Improve children learning process	17			4.29	.46
	Increase children classroom participation	17			4.64	.49
	Increase children independent problem-solving skills	15	2		4.23	.66
	Increase children independence learning	17			4.41	.50
	Help children to take responsibility for their learning	15	2		4.23	.66
	Help children to express their learning	17			4.58	.50
Total					**4.39**	**.54**

According to the results compiled in Table 5 all preschool teachers claimed that AR technology increased their students' active participation in the learning activity. The results indicate that AR promotes preschoolers to independently solve problems, take reasonability, express their learning interest and improve the learning process.

Promote Children's Social Interaction

Table 6

Promote Children's Social Interaction (n=17)

Variable	Items	Agree to Strongly agree	Undecided	Disagree to Strongly disagree	M	SD
Value to children's social interaction	Improve Interpersonal skills	17			4.47	.51
	Accelerate children interpersonal skills	17			4.64	.49
	Enhance children relationship and social interaction	17			4.52	.51
	Help children to express themselves	17			4.52	.51
	Increase children self-confidence	17			4.70	.46
Total					**4.57**	**.49**

The information in Table 6 demonstrates how AR-based applications accelerated and enhanced children's social engagement. The pre-primary school teachers hold the opinion that AR-based applications helped kids develop their ability to communicate with others as well as boost their confidence.

Increase Children's Digital Literacy Skill

Table 7

Increase Children's Digital Literacy Skill (n=17)

	Items	Agree to Strongly agree	Undecided	Disagree to Strongly disagree	M	SD
Value to children's digital literacy skill	Enhance children GLS	17			4.52	.51
	Implemented in learning process	17			4.47	.51
	Increase children knowledge of technology	17			4.64	.49
Total					**4.5**	**.50**

As shown in Table 7, teachers advise that AR-based applications improved children's digital literacy abilities. Teachers agreed that AR technology has a lot to offer in terms of improving and expanding kids' technological literacy in all of the items.

Foster Children's Fine Motor Skills

Table 8

Foster Children's Fine Motor Skill Development (n=17)

Variable	Items	Agree to Strongly agree	Undecided	Disagree to Strongly disagree	M	SD
Value to fine motor skill development	Improve eye-hand coordination	17			4.82	.392
	Enhance children motor skill development	16	1		4.70	.580
Total					**4.76**	**.486**

Table 8 shows that every preschool instructor agreed that the deployed AR application did aid in the children's growth of fine motor abilities. Children's motor skill development and eye-hand coordination were both improved by AR-based applications**.**

The Benefits of Augmented Reality and 3D Visualization's

The qualitative results identify several benefits of AR and 3D visualization in children's learning. According to the feedback provided by teachers, principals, and staff from the PIO and AR designer, AR was to be suitable for handling large class sizes and has made learning enjoyable for children. It sparks curiosity and increases engagement, making it easier for children to remember and express what they have learned. AR also promotes teamwork and provides additional assistance, especially for children with special needs. It encourages interaction, discovery, and communication, even for non-speaking children, thus fostering the development of

strong characters. Furthermore, AR exposes children to technology they may not have access to otherwise, contributing to their spirit and technological expertise. While AR has its limitations, such as not promoting learning about letter sounds, it provides platforms for collaboration and enables children to touch and see the material they desire to learn. Overall, the qualitative results highlight the positive impact of AR on children's learning experiences, encouraging their active participation and supporting their diverse needs. This is supported by quotes taken from research respondents. Participants from Yekabado preschool noted that:

> *It is appropriate to handle excessive class sizes; children are extremely happy with the application. They use various colors to trace letters. It is learning with enjoyment. AR makes children curious. The application has assisted more children with disabilities. It is effective for small groups since it requires that all children be followed up on. If they learn via AR, it is simple to remember and say; it allows them to engage more; it increases child to child support. It improves children's ability for teamwork.*

FGD participant teachers from Miazia Preschool stated the following:

> *Children are inspired to use AR, which encourages them to interact and provides platforms for initiating a variety of activities. It also helps us meet the demands of globalization, and its multiple goals allow children a greater chance to speak up. Children are happy with AR, and they actively use it. Children get the chance to engage with it. It helps children learn real things with real illustrations. It is*

> *especially beneficial to children with special needs. It encourages discovery. It removes children's fear of speaking. It provides extra assistance, particularly for children with special needs. Children who are unable to talk are supported by AR to participate in learning, communicate, and be joyful. Children who are unable to speak are supported by AR to develop strong characters (''Tat Yetnkiral''). Children are exposed to technology that not all children, especially those in poverty, have access to, which benefits their spirit and gives us technological expertise. Children are encouraged to discover new things, but AR has its limitations and doesn't promote learning about how letters sound.*

The two preschool principals also elaborated on the benefits associated with AR application as follows:

> *We are seeing how AR helps children literally touch and see the material they desire to learn. Create platforms for collaboration. In addition, after being exposed to AR, children begin to communicate. It helps identify children's genuine desires; it creates platforms for interaction; it is beneficial to children. It inspires them to learn. They are eager and motivated to learn through AR (Principal Preschool, Yekabado).*

Participants from PIO and the AR designer also expressed the following:

> *When exposed to this training, non-speaking children begin to speak. This training is an additional resource for children. With learning disabilities are supported exposure of teachers to modern technology more opportunities for children to think, imagine, interact, and be engaged.*

Teachers' perspectives on the challenges of AR in preprimary education

The qualitative findings highlight various challenges encountered in applying AR and 3D technology in education. The participants identified several common obstacles, including pedagogical limitations, a lack of alignment between the curriculum and AR content, difficulties in utilizing AR for large groups, and limited availability of printed resources to support AR practices. Furthermore, the participants emphasized the significance of adhering to the curriculum, which primarily emphasizes English instruction, whereas AR may require additional time and attention from both teachers and students. Concerns were also raised regarding incomplete pilot implementations, the need for device recharging, and the exclusion of social skills, social norms, and local languages such as Amharic and *Afan* Oromo from AR applications. An FGD participant teacher from *Yekabado* preschool stated this concern as follows:

> *There are pedagogical restrictions, Amharic is not included, and there is no connection between what we teach and what AR wants to teach us (we use sounds like A (ሀ, E), C (ከ, Ki), U (, E (, I (, and M (mi). This makes teaching quite simple. We don't have any printed resources*

> *to assist AR practices. It has to adhere to the curriculum. Children are required to study in English (for arithmetic, reading, and writing). It is frequently challenging to use since it takes more time. It is challenging to use for large groups. While concentrating on AR, certain children find it difficult to pay attention to their teachers.*

Moreover, *a* FGD participant teacher from *Miazia* Preschool stated as follows:

> *The pilot implementation has not been completed, AR does not align with our curriculum, and daily use is not feasible. You must recharge it. The children didn't pay much attention to our lecture. Social skills, social norms, Amharic, and Afan Oromo are not included in the application; it may last 15 minutes, but once AR was added, they participated for a longer period of time. We need our children to get away from technology and do other things.*

The two preschool principals, staff from Plan International, and AR designers identified various challenges related to augmented reality, which are hampering its proper implementation.

Participant principal from *Miazia* preschool:

> *Lack of time to practice AR, the teacher's dedication, poor use of AR, structure's impact on it, lack of alignment with AR, missing other subjects or contents, and AR not addressing our plan are all factors. The application does not include Afan Oromo or Amharic*

Participant principal from *Yekabado* preschool:

> *It is challenging to put into practice; it is not consistent with our curriculum; and the emphasis is on the English language (Amharic is the curriculum of the instruction). The material is implemented at all levels (AR contents were created for KG1 and applied to KG2).*

Participant from PIO and AR designer also described as follows:

> *Some instructional strategies are not addressed by AR (teachers' observations). Updated technology for us due to practice discrepancies, we were unable to stick to the budget plan. The Addis Ababa City Administration required some time to approve our project's launch. Integration into regular job takes some time.*

Discussion

The study aimed to assess teacher's perspectives towards fidelity, contributions, and challenges of AR to children's learning outcomes. According to the study's findings, using augmented reality as a teaching tool is appropriate for preprimary education. AR study awakes us the way our smartphones or technological devices support for pre-primary education. As a result, it calls to redesign to incorporate important contents by consulting veteran in the field of early childhood education.

Teacher's views of the fidelity of Augment Reality and 3D Visualization

The finding reveals a well-structured approach to implementing AR in pre-primary education. This approach encompasses meticulous participant selection, comprehensive training for stakeholders, external support from an organization, and the unwavering commitment of school leaders. The alignment of the intervention with curricula suggests the potential for positive outcomes in utilizing AR and 3D visualization in the context of pre-primary education (for further information, check the table below). The findings suggest that AR implementation varied across different participants, with some aligning it closely with their existing teaching methods while others approached it as a supplementary tool. Overall, while there was adherence to the planned sessions, there were gaps in incorporating new concepts, addressing content appropriateness, and establishing support systems, indicating room for improvement in the quality of AR implementation.

The contributions of AR in enhancing children's learning outcomes

This study aims to determine the attitudes of preprimary school teachers on the use of augmented reality technologies in preprimary school children learning activities. Results revealed that all preprimary school teachers believed that learning by using AR technologies increase children memory, motivation, active engagement, social interaction, digital literacy skills, and also enhance fine motor skill development. This was found to be consistent with other studies in which AR contributed to improving children memory capacity, remembering ability and visualization of contents (e.g., Piatykop et al., 2022; Chen et al., 2016; Garzón & Acevedo, 2019). As it is indicated in the current study, all preprimary school teachers'

beliefs that AR based application increased children the speed of memorizing the learning material and helped to retain the child's attention. Similarly, a study conducted by Garzón and Acevedo (2019) indicated that AR application improve children long term memory retention of educational content.

A preprimary school teacher's response about the value of AR in children motivation has shown that AR-based learning activities fostered higher levels of learning interest, initiation, and satisfaction of children in this study. The finding in the current study is supported by prior researchers in the area. For example, according to Düzyol et al. (2022) findings have shown that AR based application drew more attention of the children and created a greater sense of reality. A similar study also indicated that AR increased motivation in preschool education (Masmuzidin & Aziz, 2018; Akçayır et al., 2016; Bursztyn et al., 2017; Chen et al., 2016), attract the attention and focus of children (Hassan et al., 2022; Wu et al., 2013); increases students' motivation and improves their concentration and thus teaches more (Aydoğdu, 2022).

In the current study preprimary school teachers reported that the AR technology increase children active engagement toward the learning activity. There are also empirical studies that support the findings of the current study. A study conducted by Chen et al. (2016) indicated that AR based application encouraged children to make use of meaningful and enriching experiences that facilitated their learning skills and helped them to recognize the learning content and understood the material provided more quickly. Another study also indicated that with the development of technology and its integration into school curriculum, AR is predicted to lead to enhanced engagement and motivation (Mundy et al., 2019). The obtained

result in this study is also aligned with that reported by Kamarainen et al. (2013) and Lindgren et al. (2016) who revealed that students who received AR instruction showed positive learning outcomes compared to their conterparts.

The preprimary school teachers believed that AR based application improves children's interpersonal skills, self-expressions skills, and self-confidence. Preprimary school teachers had a belief that AR has the potential to enhance learning outcomes by providing a more engaging and interactive learning experience. They also viewed AR as a way to promote collaboration and social learning, which could help children develop important skills. There is an empirical study that supports the finding of the current study. In a related study, Saez-Lopez et al. (2020) shown that AR based application enables a range of interactions in the classroom among children. Another study also indicated that AR based application promotes communication skills, promoting all kinds of interactions in the classroom between teacher and students, students and students, students and families, families and families and teachers (Cascalesa et al., 2016). The findings indicated that AR techniques help in improving collaboration among group participants in preschool education. Chang et al. (2010) confirmed that collaboration among children in a group is highly increased when they share AR learning experiences compared to non-AR learning methods.

The preschool teachers agreed with the value of AR technology to enhancing and increasing children's knowledge of technology. The findings of the current study was consistent with results from previous studies (e.g., Rasalingam et al., 2014; Sidi et al., 2017) showing the value of AR based application in the development of preprimary school children's digital skills by using augmented reality tools. The results have also indicated that AR-based application improved children's eye-hand

coordination and enhances children's motor skill development. Studies also consistently reported that Augmented Reality (AR) can potentially help preschool children to develop fine motor skills. This is because AR can provide a virtual environment where children's can practice and develop their fine motor skills in a safe and controlled setting. AR also can provide a more engaging and interactive learning experience that can motivate children to practice and develop their fine motor skills. Overall, by providing opportunities for practice, real-time feedback and social learning, AR has the potential to help develop a range of fine motor skills in preschool children.

Challenges of the AR to practice in preprimary education

Inadequate time for practicing AR, insufficient teacher commitment, and a lack of alignment with the overall educational plan were factors mentioned by the principals. The participants further highlighted challenges related to instructional strategies, budget constraints, and the integration of AR into regular job responsibilities. Moreover, certain images and associated letters did not accurately reflect the Ethiopian context (e.g., A-Apple, G-gift, W-watermelon, and Y-yacht). Utilizing the letter and its associated picture not only provides a specific example for each letter but also offers opportunities for other developmental domains. For instance, associating the letter "H" with a house picture can introduce children to patterns (mathematics, cognitive development, and arts) and enhance their speaking skills, vocabulary, and fine motor skills. This example can be applied to all letters associated with their respective pictures, as seen in some of the images taken from the AR alphabet book. Overall, these findings illuminate the wide range of challenges encountered when implementing AR and 3D technology in educational settings.

Conclusions

The findings of the study highlight the importance of a well-structured approach to implementing AR in pre-primary education. The inclusion of participant selection, comprehensive training, external support, and commitment from school leaders are key elements for successful AR integration. This implies that careful consideration and planning are necessary to ensure effective implementation of AR in educational settings. One significant observation from the study is the alignment of AR interventions with curricula, indicating the potential for positive outcomes in utilizing AR and 3D visualization in pre-primary education though some concerns are not yet solved with it. This finding suggests that incorporating AR technology into the curriculum can enhance the learning experience and help children grasp concepts more effectively. However, the study also reveals variations in the implementation of AR among participants. While some integrated it closely with their existing teaching methods, others treated it as a supplementary tool. This discrepancy implies a need for standardized guidelines or best practices to ensure consistent and effective integration of AR in pre-primary education.

Recommendations

The following recommendations are forwarded on the bases of the study to improve the fidelity, contributions, and challenges of AR in preprimary education.

- Establish standardized guidelines and best practices for the integration of AR in pre-primary education. Address participant selection, comprehensive training, and alignment with curricula, content appropriateness, and support

systems. Align AR interventions with the new integrated preprimary education curricula.

- Highlight the positive impact of AR-based applications on children's memories, visualization skills, motivation, interest in learning, and overall satisfaction. Also, emphasize the enhancement of problem-solving skills, social engagement, communication skills, and digital literacy abilities through AR. Overcome challenges associated with AR implementation, such as pedagogical limitations, lack of curriculum alignment, resource availability, time constraints, and budget limitations. Invest in ongoing research, collaboration, infrastructure, and training to address these challenges.
- Promote inclusivity: Utilize AR technology to create an inclusive learning environment. Provide additional assistance for children with special needs and address the diverse needs of students. Leverage the advantages of AR to handle large class sizes, make learning enjoyable, increase engagement and curiosity, and promote teamwork.
- Conduct further research and evaluation: Assess the long-term impact of AR on children's learning outcomes, including academic performance, critical thinking skills, considering of play based learning, and creativity. Gather data to evaluate the effectiveness of AR implementation and inform future improvements.

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Context Situation of Pre-service Preprimary Teacher Education in Selected Colleges in Ethiopia: Input-Process-Outcome Approach

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Abstract

Pre-primary teacher education institutions are mandated to advancing professional competencies among personnel working with young children. The objective of this research was to examine the situation of the existing pre-primary teacher preparation programs of the colleges in Ethiopia including their contributions and impacts on the trainees. Guided by the mixed research design (qualitative and quantitative approaches), data were collected using questionnaire, interview and FGD concurrently. Data sources consisted of a total of 10 trainers, 3 department heads, and 66 trainees from three purposefully selected teacher education colleges in Ethiopia. Results have indicated that both the design and delivery of the current pre-primary teacher education had serious gaps and would not promise producing competent graduates as evidenced by students' knowledge, attitude, and self-efficacy. Six major recommendations have been given to reverse course including, among others, the need to work towards the professionalization of the field of preschool education at all levels.

Keywords: *Preschool, ECCE, preprimary school, teacher education in Ethiopia, curriculum, ECCE pedagogy*

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Introduction

Teachers are the most valuable human resources that a nation can count on in nurturing for the young (Wafa et al., 2003). Their roles and impacts on students' learning appear to make huge differences in educational success than many other variables (Darling-Hammond, 2007) and these differences are sustained and cumulative (Lieberman & Darling-Hammond, 2012). Teacher education has always been a crucial and symbolically significant field in quality education development particularly in the early grade (Martinez-Beck & Zaslow, 2006). Quality teacher preparation is known to be symbolically significant in the early grades (Martinez-Beck &Zaslow, 2006). It is an important determinant of teacher success (Bacharach et al., 2010) and teacher retention (Latham et al., 2015). It is also unequivocally instrumental for building competencies that ensure positive staff-child interactions (Martinez-Beck & Zaslow, 2006) and higher quality developmental and educational services to young children. Research indicates that it is a robust predictor of children's quality interactions with teachers, peers, learning materials, and environmental features supporting those interactions (Buysse et al., 1999, cited in MoE, 2018). This in turn has a positive impact on child outcomes (Harvard Family Research Project, 2006), in the short- and long-term (Kontos & Wilcox – Herzog, 1997), including the greatest influence on achievement (Wilson et al., 2001), emerging literacy and numeracy skills, as well as better behavioral and social skills in early childhood settings.

Such positive impact of early child development and education professionals capitalizes, to a large extent, on preprimary teacher educators' possession of the required core professional competencies. 'Competency' encompasses a set of cognitive

knowledge, demonstrable affective (dispositions, characteristics, values) attributes, and behavioral skills that enable and improve efficiency and effectiveness of professional performance (Center for ECCE, Addis Ababa University, 2023). In the context of preprimary education, competencies are seen as crucial to achieving the desired outcomes of holistic child development and learning as they consist of a combination of observable and measurable knowledge, skills, abilities, behaviors, and personal attributes that contribute to enhanced success in specific performance areas (UNESCO, 2018).

A competent person appears to possess a series of knowledge, capacities, skills and personal qualities that contribute to their personal and professional performance and enable them to thrive in the job environment (Inter-American Dialogue, 2021). Based on a synthesis of four most notable Preprimary Teacher Competency frameworks widely sampled from three different regions of the globe[5] as well as local contextual practices, preprimary teacher education competencies in Ethiopia may be taken to fall into four broad competency domains (Center for ECCE, Addis Ababa University, 2023). These four broad domains of competencies are (1) child development and learning (content knowledge, pedagogic practice, and assessment); (2) the learning environment and resources; (3) stakeholder engagement and collaboration; and (4) PPE teacher professional development. The preprimary teacher competency then involves

[5]These four competency frameworks include "Early Childhood Care and Education (ECCE) Teacher Competency Framework for Pacific Small Island Developing States" (UNESCO, 2018), the "Professional Standards and Competencies for Early Childhood Educators" in North America proposed by the American National Association for the Education of Young Children's (NAEYC (2019), and the EU recommendations on Competence Requirements in Early Childhood Education and Care (Urban et al., 2012).

requisite knowledge in child development and pedagogy, methodological skill sets that help translating the knowledge base into an effective interaction with children and parents and dispositions that sets out commitment, passion and sense of responsibility of teachers (Katz, 1992, 1995; Harvard Family Research Project, 2006; Sheridan et al., 2009). Deeper understandings of child development and early education issues enable teachers to provide richer services for all children (including those who are vulnerable and disadvantaged), to engage children of varying abilities and backgrounds, to connect with a diverse array of families, and to do so with greater sense of accountability and fewer resources (Sheridan et al., 2009). The core knowledge base, skill sets and attitudes also promote children learning by creating and managing effective learning environments (physical space, materials, activities, and classroom management), working with diverse populations of children, integration and cohesiveness by using indigenous knowledge, values and skills in educating children, and developing and using partnerships to continuously improve quality of practice.

Preprimary school preparation in Ethiopia needs to be examined in terms of its promises and delivery of teacher profiles that ensure quality learning and development outcomes of the type mentioned above. In fact, this program has a short presence in Ethiopia. While the European-based preschool education was initiated in the 1960s in the country with expatriate teaching staff running the program, the need to sustain the program by training the local staff was initiated nearly a decade later. The Menen Preschool Teacher Training program, established in 1979/80 with support from UNICEF, was the first known training institute initiated for this purpose (Tirussew et al., 2009). Despite being the only institute of its kind in Ethiopia, it did not flourish as expected because of limited demand for the service, lack of technical support and

logistics, and absence of clear roadmap for expansion of the service. The center was later transferred to the then Kotebe College of Teacher Education (now renamed as 'Kotebe University of Education'), where it is currently based to offer a diploma program in ECCE training under a different nomenclature (Department of ECCE). Recently, other colleges and universities in Ethiopia have also been showing interest in teaching preschool teachers and educators. As a result, the regional colleges in the country have already launched preschool teacher training programs at the Diploma level. In addition, some universities have also initiated ECCE training with bachelor's and master's degrees. For example, Addis Ababa University initiated the first doctoral program in the country a couple years ago.

There is no doubt then that ECCE professionalization is taking shape in Ethiopia, with increasing visibility, particularly in the last couple of decades. However, the teacher training component is in the process of development, with the curricula and modalities changing and re-changing; therefore, it is a field in search of identity. As a result, research evidence indicates that the Ethiopian teacher education system in general (MoE, 2002) [6] and the preprimary teacher education program in particular (MoE, 2022) are incarcerated with several challenges. Available institutional (e.g. Tirussew, Teka, Belay, Belay and Demeke, 2009; MoE, 2016; Tirussew, Amare, Jeilu, Tassew, Aklilu & Berhannu, 2018; MoE, 2022) as well as individual (e.g. Yayeh, 2017) research investigations suggest that serious challenges characterize the preschool teacher education program in Ethiopia. Of prime concern is that the need for a well-thought out national preschool teacher education programming has fallen into the blind

[6] For example, the contexts related to a study conducted in 2002 on the "Quality and Effectiveness of Teacher Education in Ethiopia" that led to the establishment of a Teacher Education System Overhaul.

spot of the MoE until 2014[7] and has even suffered from problems of implementation thereafter[8]. While this research evidence in itself contributes a lot to our understanding of the status of preprimary education in the country, such efforts are, however, piecemeal, not comprehensive, tangentially addressing the issue; therefore, they would contribute minimally in suggesting strategic interventions to overhaul the training system in the country. Therefore, this study aimed to address this gap.

The framework selected for this study was fundamentally informed by the IRC evaluation framework and complemented by a synthesis of the OECD model, the context-input-process-product (CIPP) model originally developed by Daniel Stufflebeam and associates in the 1960s, and successively contextualized in different settings (Stufflebeam, 2003) including Ethiopia, and the program evaluation model developed by some of the present consultants, incorporating the CIPP model. Hence, our present approach purports to provide a comprehensive framework focusing on four components (Design, Input, Process, and Outcome) of the program where we contextualized these four components to represent the preparedness (design and input), delivery (process), and achievement (outcome) of the program.

[7]The first well thought national teacher curriculum development was noted. See MoE (2014). Curriculum Framework for Primary Pre-service Teacher Education (Unpublished).

[8]See for example, MoE. (2016). Evaluating Teacher Training Practices in Ethiopia across Modalities: Focus on Primary and Pre-Primary Pre-service Program. Addis Ababa: Report Submitted to MoE; MoE (2016). Ethiopian Education Roadmap Development Process, 2017-2030: Preprimary and Primary Education: Addis Ababa: MoE; Yigzaw, H. (2015). Early Childhood Care and Education in Sedentary and Agro-pastoral Societies: What is Practiced and Being Integrated: Proceeding of the First National Conference on Pastoral Education: ECCE. Jigjiga University: Ethiopia.

These interlocking systems of education that equally apply for preprimary teacher preparation in Ethiopian colleges can be briefly described based on previous local research (Somali Region Education Sector Analysis, 2022).The descriptions emphasize resources that are available for implementing educational programs and plans, the level of implementation and performance of these programs and plans, and how far the educational objectives were sufficiently realized among the targeted learners.

Input: Inputs are the actual resources that are put at the disposal of educational provision including financial provisions to the education sector, college facilities and materials, teaching aids within the classroom and outside (like libraries and laboratories), college personnel (directors, teachers, and support staff) and related others.

Process: This involves assessing how the program is being implemented, such as teaching-learning activities done, monitoring how these activities are performing, auditing the program to make sure it is following required legal and ethical guidelines, and identifying defects in the procedural design or in the implementation of the program.

Product: This includes the general and specific outcomes of the educational program that include measuring anticipated learning outcomes in students, attempting to identify unanticipated outcomes, assessing the merit of the program, conducting a retrospective benefit/cost assessment, and/or conducting a cost effectiveness assessment.

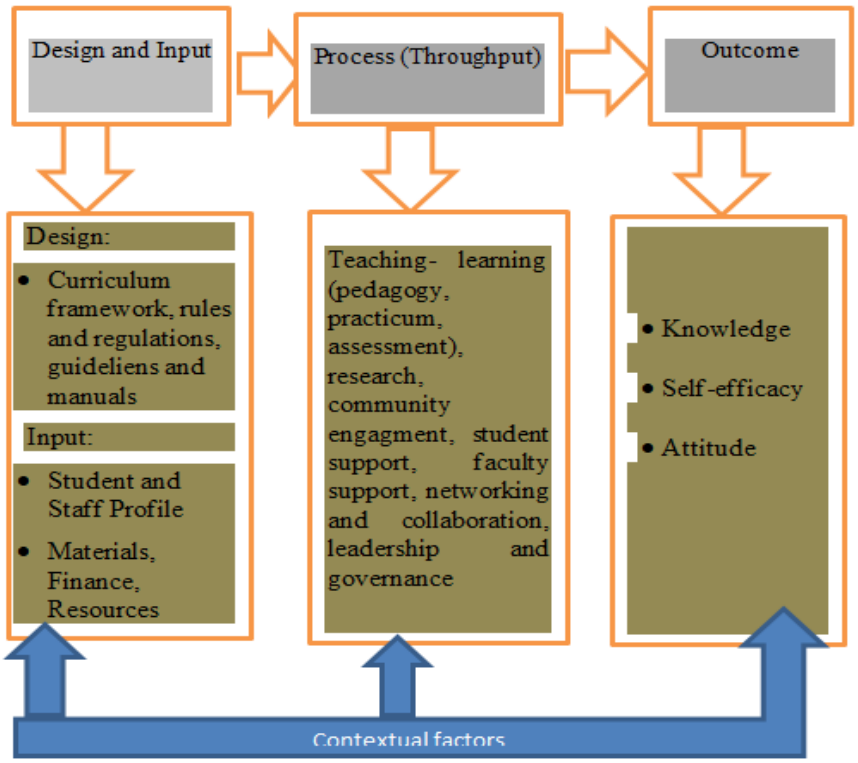

Figure 1: Framework of the Research Showing Processes and Components of Preprimary Education Assessment

In the light of all these considerations, this study aimed to examine the preparedness, delivery, and outcomes of the preprimary teacher education in selected colleges, employing the following indicators: relevance, coherence and collaboration, and perceived impact.

Relevance refers to the extent to which the modalities used in the training program (direct and indirect implementation) foster early childhood care and education. It includes activities, products, or outputs are suited to the needs, priorities, and policies of the target group; whether the expected activities and outputs are consistent with the

overall goal and the attainment of its objectives. Questions like 'Is the training program relevant to the needs of children and local context in Ethiopia?' Effectiveness refers to the extent to which processes and efforts are functioning the way they are intended? Are the designs, inputs, processes and results obtained of high quality?

Coherence and Collaboration refer to the extent to which program components are compatible to one another (internal coherence) and with other interventions in a country, sector (e.g. the preschool education programs), or institution (external coherence) and the extent to which the implementation of the program entertains collaborations among stakeholders. For example, preprimary teacher education program is said to be coherent in terms of organizing all of its course work along with set goals, as well as practical experiences, around that vision not just a random assortment of courses and experiences for people, the courses are very much connected to practice as well as to theory (Darling-Hammond, 2007).

Perceived Impact refers to the perceived positive and negative changes produced by an intervention, whether directly or indirectly, intended or unintended. The training program is intended to address the professional needs of trainees. Assessing perceived impact involves, for example, answering questions like 'How do trainees perceive the difference the implementation of the training program has made to them? Sustainability refers to whether perceived impacts or the benefits of an activity are likely to continue after training. When evaluating the sustainability of program impacts, we need to consider questions like 'To what extent do the benefits of the training program continue after graduation?'

The purpose of this study was to investigate the design, delivery, and outcomes of the existing preprimary teacher education program in selected colleges in Ethiopia, focusing on the following research questions:

1) How do college educators view the preprimary teacher education curriculum?
2) What program inputs were put in place in the preprimary school teacher education program?
3) What implementation practices characterized the system?
4) What competencies were observed in the preprimary school teacher trainees?

Research Methodology

Design

The objective of this research was to assess the situation of preprimary school teacher education program in Ethiopia from the point of view of the context, input, process, and outcome. The study uses the (concurrent) mixed methods research design in which both quantitative and qualitative data were collected simultaneously and analyzed to compare, support, or triangulate the data. This is mainly because, as many scholars in the field believe (e.g., Creswell, 2009), using the two methods benefits the evaluation from the detailed and deeper nature of qualitative data and the wider and generalizable nature of quantitative data. The strengths of one method often offset the weaknesses of the other.

Participants of the Study

Participants of this study were drawn from colleges of teachers' education (CTEs) in Ethiopia. CTEs are educational institutions aiming at equipping prospective teachers with the required requisite knowledge, attitude, and skills for work as a teacher from preprimary to secondary schools. There were 39 teacher education colleges with the greater majority (22 of them) were from Oromia and Amhara regions. They provided a three year diploma-level education in teaching through regular, summer, and evening extension modalities (EMIS, 2022/23, p.83). There was at least one teacher education college in these administrative areas. Each of the regions, emerging regions, and city administrations were represented by one teacher education college. In the sampled institutions, focus was on pre-service preschool teacher training at the diploma level. There were about 24 preschool teacher educators in the three colleges and all available preschool teacher trainers (N = 24) were taken. Among the three deans, two deans (N=2) and from the three department heads/ coordinators, three (N=3) heads were involved in the study. All graduating class teacher trainees from the three colleges (N=66) were participants of the study.

Data Collection Tools

Questionnaire, interview and FGD were employed to collect data from participants of the study. The questionnaire was self-developed based on the literature and previous works. The questionnaire was used to assess preschool teacher trainees' self-efficacy and knowledge about and attitude towards preschool education as a professional practice. It consisted of a total of 35 items such that 14 were forced-choice (wrong or right) items for measuring knowledge, 9 items with five-point rating scale

for attitude, and the remaining 12 were items with four level options for self-efficacy. The possible minimum and maximum scores were 0 to 14, 9 to 45 and 12 to 48, respectively.

The interview guide was employed to collect data from teacher educators and department heads on perceived effectiveness of the preschool teacher training program, curriculum of the program, qualification and professional development of trainers, relevance of the curriculum content, pedagogy, resources, assessment and governance and leadership. Focus Group Discussions were held with students about the relevance of the curriculum, the pedagogy, practicum, resources, etc. There was one discussion group in each college.

Data Analysis

The quantitative data obtained through the questionnaire were entered into SPSS; the data were then cleaned and analyzed. The analysis was made using descriptive statistics such as mean and percentage. The qualitative data analysis passed the following stages as data transcription, coding, categorizations and thematization. The recorded interviews and FGDs were transcribed by the researchers. After the transcriptions were done, coding was carried out. Based on the identified codes, the themes were identified.

Ethical Considerations

The study was conducted with the consent of the research participants. During the data collection, each participant was briefed about the purpose of the study, and all gave oral consent.

Results

This result section is presented in four segments. It begins by depicting the background profile of the participants. The second part synoptically presents the input and related contextual factors (i.e. curriculum material, trainees' entry behavior and selection context, faculty profile, resources, and modules used) affecting the preprimary teacher education preparation in the sampled colleges. The third part presents the educative process, including pedagogical practices, students' practicum work, assessment issues, and leadership and governance practices. The last part presents the perceived impacts of the training on students (in terms of knowledge, attitude and self-efficacy on the job to come).

1. Profile of Sample Participants

Profile of the Sample Trainers

A total of 10 trainers and 3 department heads were sampled from the three institutions. As indicated in Table 1, only three were females and ten were males. Conversely, there were three male and ten female trainees. All of them were MA holders (two were PhD candidates). Among these, about 69% specialized in early childhood education (n=4) and psychology (n=5). Their age (minimum = 31, maximum = 53, mean = 40 years) and service year (minimum = 4, maximum = 29, mean = 40 years) suggest that they were not novice but relatively experienced and, therefore, can handle the responsibilities with some competence.

Table 1

Profile of Sample Preschool Teacher Trainers and Heads from Three Teacher Education Colleges in Ethiopia

College	Code	Name	Sex	Age	Qualification	Academic field	Service year
	01	Teacher 1	Male	35	PhD Candidate	EdPM	12
	02	**Chair**	Male	53	MA	Curriculum	29
	03	Teacher 2	Male	50	MA	Curriculum	26
College D	04	Teacher 3	Female	41	MA	Psychology (M&E)	
	05	Teacher 4	Male	46	MA	EdPM	
	06	Teacher 5	Male	33	MA	ECCE	
	07	Teacher 6	Male	55	MA	Psychology	
College K	08	**Chair**	Male	34	MA	Psychology (Dev.)	8
	09	Teacher 1	Male	47	MA	Psychology (Dev.)	13
	10	Teachers 2	Male	33	PhD Candidate	ECCE	4
	11	**Chair**	Male	32	MA	ECCE	5
College H	12	Teacher 1	Female	32	MA	ECCE	5
	13	Teacher 2	Female	31	MA	Psychology (Social)	7

Profile of the Sample Trainees

The profile of the sampled trainees is summarized in Table 2. A total of 66 participants were sampled of whom seven were boys and 59 were girls. They were recruited from grade 10 in the old system and grade 12 in the new system. About 34 indicated that they joined the program with choice. However, when asked why they joined the program if it was not their choice, 40 of them gave reasons suggesting that those who responded that they joined with their first choice were not doing so, but instead responded possibly for social desirability reasons. The reasons they gave appeared to us to be genuine because they met our expectations: '… until I get another

job', 'pressure from others', 'the opportunity came in…', '… I picked it', '… did not have another choice', and 'to try it and change later'.

Table 2

Background of Trainees before and after Admission to Colleges

Variables	**Categories**	**College D**	**College H**	**College K**	**Total**
Age (mean)		21.92	21.34	23.26	22.138
Entrance Result Grade 10 (mean)		2.60	2.30	2.395	2.4143
National Exam (12th Grade) Result (mean)		329.92	276.07	336.0	313.9
College GPA (mean)		2.58	2.62	2.48	2.56
Sex	Male	0	3	4	7
	Female	13	26	20	59
Grade level before joining the college	10	1	1	21	23
	12	12	28	2	42
Was preschool program your first choice?	Yes	9	24	1	34
	No	2	3	1	6
	Not sure	2	0	2	4
If not your first choice, why did you join?	Until I get another job				3
	Others' pressure				1
	Not to lose the opportunity				4
	I had no other choice and I was hopeless				8
	Just to try it and change it later				19
	Other				5
	Total				40

The mean national exam results for grades 10 (2.4/4.0) and 12 (314/700) and, surprisingly, the college GPA (2.56/4.00) were consistently the lowest. This confirms

that the college training did not improve trainees' academic standing but rather reproduces statuesque. These GPAs also confirm the established belief in Ethiopia that only students with borderline GPAs joined the teaching profession

2. Inputs and Contexts

Curriculum

Curriculum is a roadmap and blueprint for providing holistic services that are planned to be delivered to children. An effective preprimary teacher education curriculum needs to establish itself on principles that the curriculum needs to: be based on the philosophy that supports holistic child development, apply child appropriate pedagogy, ensure professional identity and commitment, link the ECCE program with the preschool centers and community settings, promote cultural values and beliefs, use children's capability and experiences, reflect developmentally appropriate practice, and ensure parental involvement in child learning and support (MoE, 2018).

Along with these principles, the curriculum for preprimary teacher education program needs to be flexible to build knowledge and skills about the developmental needs of children so that the trainee would be able to promote physical, cognitive, social, emotional, linguistic and aesthetic development of children up to 8 years of age. Other content areas that may need to be included are resource mobilization and management, use of community resources (both human and material), enlisting community participation, building relationships with parents and establishing collaborative and cooperative links with ECCE and other agencies.

Awareness about local environment and natural surroundings, community dynamics, national and local customs, fairs and festivals and community mode of social living, appreciation of places of historical and cultural significance are all necessities. The diploma program for preschool teacher preparation, which was developed in 2014 consisted of 42 courses that were grouped into bridge, common and profession courses. In a document that claims to be a revised curriculum developed in 2018 (but not implemented), it was indicated that this curriculum that was under implementation then was described as unable to address vertical and horizontal links and holistic child development. More a focus was given to few domains such as literacy and numeracy over other domains. Further, it lacks developmental and cultural appropriate practices that were considered to have shown lack of standardization (expressed in terms of teachers' profile, indoor and outdoor materials etc.). Contents prepared for six years and above were offered for three years, four years and five years. While sharing their views about the effectiveness of this training program, participants took lengthy time elaborating on the profile of this curriculum.

The discussions that are synoptically presented below generally underscore that that curriculum had lots of drawbacks that needed to be rectified before taking any other substantive measure of improving the preservice teacher preparation in this country. The reflections of participants on the preschool teacher preparation curriculum were critical; fundamentally revealing how inadequate the training curriculum is in so many ways; except for an interviewee who endorses that the curriculum is relevant, "... I have taught trainees Child Play, Material Production and Curriculum and they are adequate for them. As long as it is a new program, it is enough…" (D03***)***. The remaining all underscored how the curriculum was ineffective:

> *should be redesigned (D04), hinders producing effective teachers (K08), unable to produce qualified preschool teachers (H12), and lacks relevance as many were quoted to say: Only limited courses are relevant to the profession (D01); fails to reflect children's developmental, creative and play needs (D02); does not seem to include international experiences as well as the realities and needs of the community (H11), lacks relevance, contents staffed and not practice-based (D02**),** many of the courses are irrelevant (D05) and not customized to the needs of the trainees (D06**),** over 50% of the courses not relevant to the preschool program and trainees are wasting their time to cover these courses (D06).*

Most of the critiques directed at relevance held it that the program was related more to primary rather than preprimary level: most of the courses were not relevant to preschool teachers; rather the courses were prepared to train primary school teachers (K08; D04; H11; D04; H11; D02**).** The courses were not relevant. The curriculum did not match with what trainees were supposed to do. What was given to the trainees was completely different from what they were practicing. There is a huge curriculum mismatch (D01).

Selection and Recruitment of Trainees

Although preschool teacher quality is a subject of continued controversy and is yet to be settled, a cursory inspection of literature generally stipulates that a good preschool teacher is expected to develop such qualities as patience, passion, and compassion. These qualities are personal dispositions that hardly take course during college training. Therefore, trainee selection needs to be stringent to identify candidates

with these dispositions. In this regard, attempts were made to check the seriousness of the trainee recruitment process in the sampled colleges.

Review of the responses of interviews with the participants has led to generating a new theme that was not included in the suggested interview guide. This theme that has transpired from interview responses pertains to the issue of trainee selection and placement. This analysis has revealed issues relating to recruitment guides, minimum requirements, entrance exams, profile of the applicants and trainees, parties involved and the selection and placement processes. Below are the responses organized under these categories.

Recruitment procedures

Recruitment procedures seem to vary among the three colleges. In one of the colleges, the recruitment guide is prepared by the regional education bureau every year and shared with the colleges. Once the guide is received by the college, then it organizes orientation and gives direction to techears so that the recruitment proceeds in accordance with the guidelines of the Bureau. College teachers are required to prepare entrance exams and administer them going down to the different local districts in the region where candidates are expected to be found (H11). In the other college, too, entrance exam is used but entrance exams are prepared annually by different colleges in the region in turns *(D05).* The selection in third college seems to be done without the involvement of the preschool department *(K10)*. This group expresses that one of the problems they have is that they do not have a say in the selection process:

> *Our students are selected by the Addis Ababa city administration and it is the city administration that sponsors the students. We do not have*

> *involvement in the selection process; we are not given the opportunity to see the selection guideline. It is only female applicants selected to the preschool program; even if they do not have the ability and interest to work with preschool children. It also hinders interested and qualified male candidates not to come to the program. These problems affect the quality of students who are assigned to the program (K10).*

The entrance exams used in the two colleges were critiqued for having different shortcoming: not as such able to discriminate among applicants and not challenging *(D05);* applicants' notions about the profession are not well tested; instead, it does the sorting by asking general knowledge questions orally *(H12);* written test is the same for candidates, i.e. neither the written test nor the oral question is intended for recruiting preprimary trainees alone, but is a joint entrance test for all levels intending to join the college and the same is true for grading the performances on the tests *(H12, H13).*

Profile

Two critical concerns were observed with respect to the profile of trainees. First is the tendency to feminize enrollment and the unwarranted implication of female incompetence. As per the regional directives in the two colleges, females are given the priority during admission. Within the limits of the enrollment size allocated for the year, females are likely to be admitted if they meet minimum requirements because there is a recognition that their feminine background contributes better at caring the children than males (D05; H12; H13). In the FGD conducted with five boys in their third year program, it was found that the males felt the admission procedure was selecting out and excluding males (HFGD). They were also asked about what they felt joining a field that

was apparently left for females; if they felt differently; if felt that they were in a wrong place; and if they change their mind if given a second chance? They all responded that they didn't feel anything different for joining this field; that they can do what females do, and they didn't experience any different problem during practicum because of being boys. They said that it was not that they were in a wrong place; but the guideline stood for a wrong cause at a wrong time and condition and, therefore, needs to be revised.

The second critical concern is the entry (high school academic) profile of trainees at admission turning out to be low as indicated in Table 2 earlier. The college teachers were complaining a lot that the entry behaviors of the majority of candidates were substandard (unqualified and not assigned based on choice) both in terms of ability and interest to work with children (K10; D03; K09; K10). Those who are not having other options are joining the field (D05). Most of the students are assigned to the preschool department when they do not qualify for other programs (K09). If students who join our college are from grade 10, they are those who cannot join the preparatory. And if students who join our college are from grade 12, they are the ones who fail to join university. Even these with lower profile applicants come to us after they fail trying all other available choices; teaching is a last resort for our trainees (D05; H11). Preschool education considered the least in the choice and those with lower profiles preferring to join it; the field is considered as if it is meant for the weak, the underperforming (FGD, HCTE). The profile of the applicants for preprimary level compared to other teacher education programs in colleges is articulated in a very fascinating way in the following vignette:

> *We learned that those who feared that they might not get the chance to compete and win in other departments and those who have low self-*

> *esteem choose our department; thinking that it would not be difficult for women to compete with each other. In fact, sometimes there is a quota in the other departments, which means that if you do not compete in the mathematics department, you will have to enter preprimary (including boys) (H12).*

Teaching Faculty

Literature presents the academic discourse surrounding qualities of trainers of preschool teachers. Trainers of Preprimary Teacher Education Programs are expected to have so many qualities in one: be academically qualified, physically fit and healthy, active and energetic, socially warm and friendly, have love for children and teaching profession, use appropriate teaching skills, and have ability to tryout innovative and creative methods of teaching. Again, they have to develop interpersonal and interactive skills, be open to criticism, achieve the goals of the institution and develop rapport and creating friendly environment.

To begin with issues of selectivity of educators at employment, it has become crystal-clear over the course of the last decade that the teaching profession in Ethiopia has, in its broader sense, fallen into disfavor, if not a crisis. The traditional approach of predominantly relying on GPAs in recruiting college educators, grade inflations in institutions of higher learning amidst quality of education that has incessantly been on decline and the changing face of the teaching profession in Ethiopia increasingly growing into a source of discontent and disdain among incumbents would, from the outset, jeopardize the very pool from which selection is to be made. Profile of the teaching faculty is further nuanced amidst practices that restrict the freedom of colleges

to do the selection in their own terms thereby putting a system that buys in teaching staff without ECCE background [9](D02). It is not only that nearly all educators teaching subject matter courses to preprimary trainees were the same teachers trained for primary schools and lacked training on early childhood education, but also that they didn't even take note of the fact that this would make any difference in preparing those teaching young children (D06; H12, H13;D07; D01; H13). They also lack commitment (D06; H12, H13; D02) and, therefore, may not engage in self-learning to improve one's profile**.** Teacher trainers are module dependents. Every teacher teaches what is written in the module; we do not as such update ourselves with the contemporary developments" (D01).

Some trainers also seem to have undesirable attitude towards the preschool teacher program and the trainees in particular. "Teachers assigned to us from other departments are not happy believing that they are assigned to teach in a 'dead' zone; to express that the trainees hardly grasp what they are taught (H12). Another participant (D04) argued that both the trainers and the trainees are not interested in the preschool education program.

[9]For example, an interviewee said "the regional education office's hiring practice of college educators doesn't require background in preschool education like, for example, the previous year where 12 graduates were employed without adequate profile. The Office hired 12 graduates without any training in preschools but our graduates are better than them *(D02).*

Unexceptional to views above of ineffective teaching faculty is also observed where nearly all interviewees have indicated that those who teach core ECCE courses have the required level and type of qualification**,** are effective in all measures even if there are some individual differences ***(****K09; K10);* are committed *(K10),* have positive relationship, collegiality, and sense of cooperation among themselves *(K09; K10).* An interviewee expressed this commitment as follows: Seeing themselves from the trainees' perspectives, they indicated that they were working to become role models *(K09).*

Some interviewees have in fact indicated that the ECCE trained professionals have some gaps. For instance, "the department teachers who are ECCE graduates lack practical training and lack teaching techniques due to absence of enough skill-based training in the higher education" (H12). The actual training background of educators *per se* would lack practical skills required of college preschool educators. As it was also noted from some participants attending on-job short-term training that incited second thoughts about the quality of pre-service training, they received for longer to qualify for BA/ MA degrees (*D02; D04).* For example, an interviewee recalls an experience in a two-week training program: "This two-week training is by far better than what we had for three years in college in terms of helping children. We were qualified academically but not qualified to help and support children develop properly. The courses did not help us understand who children are what they need" (D02).

Resources

Preprimary teacher training colleges need resources to provide lessons for preschool teacher trainees. These educational resources can be acquired through several ways: they can be purchased from manufacturers or business people, brought to

colleges from communities in different ways (e.g. by student teachers during practicum), or developed in colleges themselves by experts/ developers (artists), trainees or educators. However, visits in the three colleges indicated that there are no preprimary education resource centers. This also means that ECCE courses including the development and utilization of ECCE resources are not brought to class through resources.

At the level of an individual instructor, responses regarding availability of resources are divided; not in fact contradicting but a difference in focus. Those saying "resource not available" *(K09; K10; K10; H11; H12, H13; D03; K10; K09)* seem to focus on what is missing. Those saying resources are not a problem are focusing on what they have. For example, the case of interviews from one of the colleges indicated, except for some who mentioned lack of books and videos **(**D03**)**, that lack of resource is not a problem (D01; D05; D02; D03; D04; D05; D06; D07) or consider resource constraints as personal problems of educators because they are manageable anyway (D04; D07; H11). One of the interviewee said *"*if the trainers are committed, resources are not as such concerns. By the way, training preschool teachers does not need sophisticated resources. We can use local materials*"* (D04).

Another participant complemented *"*in my previous experience in other college, trainees graduate after producing a set of preschool teaching materials as a package and that practice should have been practiced here. *Of course, it requires budget*" (D07).

The above two examples demonstrate that local resources are abundant in the communities, and they can be easily used for teacher training. However, educators need to possess a working knowledge, appreciative attitude and skills about selection,

organization, management, and utilization of locally relevant and developmentally appropriate resources.

Modules

Participants expressed, while discussing about curriculum materials, that there were different problems associated with the preparation of the modular materials including the fact that the modules under use were not developed for the relevant group, by relevant professionals and in relevant ways and, therefore, hardly contribute for preparing preschool teachers. The participants' indicated the limitations of the modules. The first groups of responses are related to the fact that the *modules not matching the level*; the modules were prepared to that of other diploma trainees and do not connect the trainees to their regular work (D06; H11).

The second frequently mentioned issues related to modules is the fact that the modules are not practical. The modules are not based on practical activities which reflect the actual preschool contexts. The modules are full of quotations from theorists like Freud and Erikson but how theories can be translated into practice is not indicated (D04).

A recurrent theme observed in the responses of participants is the fact that the modules were not practical enough to assist trainees develop understanding and skills about preschool education. Here is a statement from an interviewee that reflects the views of others:

> *We used to train preschool teachers at Certificate level. When modules were prepared for certificate program, they were more of practices. Preschool teachers should teach all subjects through play and when we*

> *had been training certificate level preschool teachers, much of our time was spent at the field. We were happy and trainees were also happy. When we come to the diploma level, the modules are all about theories. There is no practice in it. The diploma modules are not properly prepared and they are not good. As a result, after trainees graduated, they were not able to teach children. They know nothing about how they would teach children. When I ask them why they are not teaching practically or through play, they said that they were taught theoretical courses (D04).*

In fact, the authors of this article were also able to inspect the contents, formats, development and organization of three modules secured from educators in one of the colleges. The modules were found crammed with facts, less organized and less coherent, not dialogical and engaging the learners, less critical questions involved, and more importantly confine the learner to classroom setting and fail to encourage exploratory learning.

3. Processes and Contexts

Classroom Pedagogy

The participants were asked to share the prevailing pedagogical culture in their colleges. The responses categorized into different themes suggest that college practices that are created to invent and promote effective pedagogy are in themselves trapped by their own inappropriate practices as we can understand from their commentaries. Nearly all interviews have brought forward that the pedagogy employed to translate the curriculum into teaching was theoretical, lecture-based (K10; K08; K09), teacher-

centered (D03), not practice-oriented (H11; D02; K09; D02; D07), not student-centered, not technology-assisted (K09) and no demonstration as to how they should work while teaching children even when, according to an interviewee, some courses like assessment needed to be given practically (K09).

> *Supporting the ideas mentioned above a participant in one of the colleges stated "I do believe that preschool teacher training program should be practice-oriented. However, most of the time we teach theoretical issues than practical ones" (D03). Another participant also stated "We do not teach students in a practical way, except in practicum" (H11).*

Another participant (D06) relates trainees' lack of competence with the problems related to the pedagogical methods used in the teacher training colleges stating,

> *The reason that students are not competent is that we do not train them practically. We do not demonstrate as to how they can care, support and teach children. Everything is theoretical. We do not have enriched materials that can help them be competent teachers.*

Participants also expressed that the pedagogy was not play-based (D04; D06; K09; D05) even in courses about play. A teacher trainer participant (D01) in one of the colleges stated "The only courses that are relevant to preschool teacher trainees are two: play and material production. Even these courses are not properly offered. We teach the contents of play, not as to how they use play".

An important issue consistently raised as a problem particularly among interviewees from one of the colleges is use of a similar pedagogy in preschool teacher training that is used in primary school teachers' training. Related to this idea a participant (*D01*) revealed "The pedagogy we use while teaching ECCE students and teaching Chemistry or Physics or mathematics students should be different. But we use the same pedagogy for all teacher trainees*"*. In support of the above idea, another participant (D02) stated *"*when teachers are training preschool trainees and non-preschool trainees, they use the same pedagogy and this might be due to the lack of training as to how they could train preschool teachers".

The participants attributed their failure of using appropriate pedagogical methods to various external and very few personal factors. The most prevalent external factors mentioned by most participants include workload, large number of students and sections (K08; K09; K10), shortage of time (K09), the nature of the courses being unsuitable for student centered and practical teaching (H11), many of the courses are offered by other department teachers (H11), lack of conducive environment to make the training practical (D03) and unavailability of instructional technologies in the colleges (K09; K10).

Personal inadequacies like attitudinal problems, lack of skills and experiences were not mentioned except in few cases where the problem also includes trainers' lack of experience *(K09),* misconceptions about the meaning of student-centered pedagogy *(D01),* and lack of commitment *(D04).*

Student Practicum

The second important component of preschool teacher preparation is the practical aspect where trainee teachers are taken to preschools for learning teaching through practice. This component appears the single most unforgettable experience in the life of the trainees. It is unforgettable because it is emotionally laden; full of fear and uncertainties first, stressful in meeting expectations in the process but exciting to many when it is about to finish.

The design of this practicum component is composed of four courses that are developmentally organized into four phases. The first practicum is preschool visit and observation. In this practicum course, the students go to a preschool for four consecutive weeks and observe the overall situation of the preschool focusing on the location of the school grounds, environmental safety for children, playground and materials etc. The second practicum is working in the classroom with the children under the mentor's supervision.

They are expected to conduct critical classroom observation focusing on general activities in the classroom, such as school content, teaching methods, use of resources, and classroom management. The third practicum is referred to as "assisting the mentor" in which the students assist the preschool teacher in the works she does gain experience working together with the help of a regular classroom teacher, take assignments, develop teaching aids, and organize a portfolio. The fourth practicum course is "independent teaching" in which the students teach preschool children independently (K10) and substitute the teacher to teach for one month (H12, H13). In relation to this, participants were asked about their experiences of student practicum and shared their perceived importance, procedures, phases and challenges as presented here under

Concerning the perceived importance of student practicum

An interviewee (H11) believed that practicum during training does not seem to be very important in terms of qualifying trainees. The modules of the practicum are designed for elementary schools and do not connect the trainees to their regular work.

For example, a participant (D06) from one of the colleges stated "students do not apply what they have learned in the college during practicum; they rather learn new things from the preschools and apply this experience". Another participant from a different college indicated the practicum is highly relevant both for the students and for all the teachers who are involved in the practicum. We benefit a lot engaging in practicum supervision (K09). The participants also claimed that the practicum provides practical experience for trainees. For example, a participant indicated that:

> *Practicum plays an important role. If there was no practicum, it would be difficult for trainees to acquaint themselves to the job. It has psychological impact. When are introduced to a classroom, they feel shy and they improve this behavior through the practicum experience. They learn from the practicum as to how they can teach, children behave, and how to manage them. In their reflection after practicum, they reported that they didn't think that children's behavior was like what they have seen during practicum. At least it will not be new when they start the actual work (D04).*

In their responses concerning the practicum the participants discussed its objectives and focuses. A participant indicated that the practicum has the objectives/focusing, the first one is giving the students exposure to the preschool work environment. The second objective is to help the students to practice what they learn

theoretically in the real situation. The issue of child development, classroom management, student assessment, and pedagogy related issues are the focuses of the practicum course (K09).

A review of the practicum procedures from the practicum guides of the colleges indicated that the practicum in each phases is supposed to begin with orientation to both the students and staff before deployment to preschools, provide ongoing field-based joint supervision of college and preschool staff to monitor the progress of student teachers through provision of constructive, timely and concert feedback, followed by assessment of learning and finally a post-practicum conference to reflect on the entire processes and performances of the practicum. This being very pertinent procedures to ensure growth and learning through the practicum courses, the responses of participants, however suggest that the procedures were not observed consistently across colleges and within same college across years and also not conducted as per requirements, guides and formats.

Even if they endorse the importance of the practicum course, the teachers were worried about implementing the practicum as it is intended and they mentioned a variety of factors for the failure. Frequently expressed complaints include, for example, difficulties fully observing the procedures, pre-practicum orientations not being able to create readiness for the practicum (e.g., they did not even understand differences among the four phases), supervisions and follow ups being inadequate in many cases thereby limiting feedbacks for the trainees, and post- practicum conferences usually not held (K09; K10).

A number of technical, administrative and logistics problems were mentioned to justify the failures: lack of transport service for supervisors (K09; K10); no support and supervision particularly for students who were assigned in far woredas (H12, H13), lack of incentives to supervisors and preschool teachers (only 10 birr is given to preschool teachers as an incentive) (K10), random assignment of supervisors as in, for example, a physics teacher being assigned for supervision of a preschool trainee (D06), a physics teacher has no knowhow about preschool education and yet can be assigned and evaluate a preschool teacher trainee (D04; D07); "The current practice is that anyone instructor in the college who has never been teaching preschool teachers can be assigned to supervise them" (D07).

Additional problems reported from different colleges that require serious intervention include the following: lesser attention and lack of interest: Less attention given to practicum courses from the management (K10); the preschool supervisor's lack of interest to support the students and unable to give opportunity for the students to work under their supervision (K10). Time constraints: Shortage of time to complete all the practicum objectives (K09); what I do not like about the practicum is that the time is short and students cannot consolidate their experience. Trainees observed by their instructors only twice (D03); we observe them for 40 minutes and give them feedback. Then we repeat it once again and then (D04; D07). Discrepancies of formats: Discrepancies between the lesson plan format we teach to the trainees and the lesson plan students use in the practicum (D01). Grading concerns: This time around, practicum is becoming an opportunity for students to get better grade (D04).

Assessment

The assessment practices used by the preschool teacher trainers were assessed and the general observation of the responses indicated that assessment practices are limited in scope and not picky of data helpful to gain insight about children's developmental needs. They can generally be categorized into three themes as *purpose, assessment of preschool teacher trainees, and guideline.*

Regarding the purpose of assessment, the participants indicated that no practice of task-oriented assessment system is available; assessment did not measure improvement but focuses on academic achievements *(H11);* content of the assessment course itself not enough to assist trainees to assess the overall development of children after training *(H12, H13);* no portfolio assessment used (D07); formative assessment does not exist *(D04);* assessment for learning is not implemented, though the number of students is manageable *(D01);*assessment is only summative and implemented in order to grade students alone *(D04,).*

The assessment of preschool teacher trainees needs to be different as they are required to use different assessment techniques with preschool children. However, the participants indicated that there is no different assessment technique applied for preschool teacher trainees (D03). The same approach that is used to assess other diploma trainees is used (D05)

Assessment guidelines are provided in the colleges that determine what kind of assessment to use, and the weights to be given in fixing the final grades. For example, in one of the colleges, the legislation states a 40/60 ratio in which forty percent for final exam and 60% for continuous assessment. Interviewees indicate that it is impossible to

violate this or customize it according to the nature of courses *(D01; D02; D03; D04; D05D06).* In one of the institutes, too, there is a university-wide guideline to be followed as in other diploma programs suggesting 50% continuous assessment and 50% final exam (K*08; K09*). A similar guide exists in another college that the assessment involves 40% project, 20% mid-exam and 40% final exam. The project and tests (60%) are considered as continuous assessment and the remaining 40% is final exam*(D02).*

However, the continuous assessment seems to provide better freedom about the type and number of assessment techniques to be employed. A participant (K08) said "we use different types of assessments depending on the nature of the course. For some courses we use practical works as a means for assessment." Another participant from the same college stated "we try to use assessment methods that help us to assess the students' skills that help them to be good preschool teachers (K09)". A participant from a different college indicated that **"**we mainly use exams even for the continuous assessment; we use test 1, test 2, test 3 kind of assessment (D06).

Governance and Leadership

As a brain of an organization, governance /leadership is mandated to initiating and sustaining hard work, assuring and affirming early signs of success, systematically challenging the challenges confronting an organization than shying away from them and, in doing so, taking organizations to a higher level of performances.

While the traditional system of higher education has fundamentally taken stock of a triangular mission of teaching, research and community services, more recent reforms seem to institute rather more complex and hexagonal missions of teaching, research, community engagement, resource development, student support and

development, and staff support and development. In this regard, teacher education colleges in Ethiopia are fundamentally focused on educating trainee teachers; to a significant exclusion of the other two missions the traditional higher education system; not to talk of the hexagonal missions of colleges. In this regard, college governance activities have seen themselves unfolding, both in positive and negative ways, from the moment of student selection all the way to graduation and, in some cases, to post graduation experiences to understand its impacts on communities. A number of instances were observed in the previous discussions, as well as responses directly generated from participants that call for critical interventions in the leadership domain to ensure the ultimate success of the colleges. These areas of intervention are briefly presented below, beginning with student selection.

College engagements beyond teaching

In all the colleges and across many more, there has been role constriction and confinement of college engagements to the teaching domain alone; community and research engagements nearly non-existent.

Student selection and placement

There is a tendency toward feminization of preschool education as a result of the selection procedure that excludes boys. Furthermore, nearly similar procedures were observed with the primary teacher education in screening entrants for the preprimary one except for the requirement that gives priority to females.

Student support and development

Student support and development are fundamentally tied only to academic teaching in the classroom, and little support for student development is given, suggesting that students' holistic growth would be minimal. Even mentoring during practicum work was not to the expected level.

Faculty management, support and development

Course assignment was mentioned as an area inappropriate management was observed. The assignment of faculty in departments outside ECCE to teach preschool courses was random and anyone can be assigned irrespective qualification type, prior experience, level of preparation and interest (D02). Those who teach courses in one year are to be replaced by others who have never taught such courses in another year. Teachers did not even benefit from their experience (H12, H13). Here is an extended vignette from an interviewee.

> *Teachers coming from different departments train preschool teacher trainees. Those teachers who are assigned to preschool program are assigned by lottery method. However, rather than randomly assigning teachers, it would be better to assign teacher trainers using a definite criterion. For example, to teach English, teacher A would come this year and teacher B would come next year. Rather, a teacher should have been assigned every year or regularly so that he/she could learn through experience as to how they would train preschool teachers. Those who are assigned should also be given short-term trainings or refreshment courses (D07).*

Other interviewees have also complained that there has been a sort of competition in course assignment and ownership of those in professional fields with those in preschool department. …For example, there is a course named 'early childhood education'. This course had been offered by any faculty from professional department. But this course should have been offered by those who are trained in the discipline (D05).

Resource development

It was noted that there was an entire dependence on government budget and lesser initiatives were taken to pool resource from other different internal and external sources. As a result, there is scarcity of resources in colleges.

Faculty support and development

Faculty support and development, mainly the continuous professional development, is not adequately conducted as many participants mentioned. In fact, the Federal Ministry of Education has developed different strategies to facilitate development of teacher competence at different levels that include establishing the Teacher Development Program (TDP), and the continuous professional development (CPD) strategies and guides. Some NGOs working on children like UNICEF would at times take their own initiatives to provide training to educators and students on some emerging issues like play-based pedagogy, child assessment and children with special needs.

Three groups of responses were identified relating preschool teacher trainers' support for professional development. These are "not needed" (D04), "no support" (D03; D04; D07) and "some support" (D02; D06; H11).

Relationship with agencies outside colleges

Department has never discussed the quality, training, and definition of pre-primary education with the leadership of Woreda, Zone, Regional and some affiliate centers. During the practice, briefings will be provided to school principals and administrators through the program unit (H11). We also communicate and discuss with other stakeholders whenever we get the chance (K08). Important relationships seem to exist between colleges and NGOs who help through capacity development. There are short- term training workshops offered by NGOs such as UNICEF but these are individuals who may use it for themselves. We did not see them using this training at college, nor did we see them utilizing training contents to train preschool teachers (D06). UNICEF supports us to train in-service preschool teachers for O-class by acknowledging that the graduates have limitations in addressing children's needs (D02).

Participatory leadership

Curriculum development at the level of the Ministry of Education was not based on participation of adequate number of experts in the field **(**H11; K08**)** and yet colleges could not make revision to the curriculum despite the fact that the curriculum is not relevant (D01); module development was also indicated to be exclusionary of preschool teacher trainers (D04); and regions can only translate the curriculum into their local language (D02; D05). College level management not participatory and we are not happy

about that (K09); we do not participate on issues that are directly related to our program (K10). Participation in course and teacher placement, preparation of instructional teaching modules, participation in practical presentations and general briefing is not fair and participatory in another college (H11). Often people and staff who are closer to higher college officials are invited even though it is not their place to do so (H11). While there is a tendency for the college to do a good job, there is a gap in terms of system deployment (H12, H13). In our College, we have three staff graduated in ECCE at MA level. But ECCE is led by a curriculum graduate. There is a tendency of not giving the position to the ECCE graduates (D01).

4. Perceived Program Impact and Contexts

We need to begin with some affirmative responses from two interviewees saying that the college training is somehow beneficial: One of the participants said "actually we are producing relatively effective preschool teachers" (K09); "…they are more committed and interested trainees than those in other diploma programs*"* (D03). Keeping in view personal observation during practicum, this second interviewee (D03) remarks commitment among trainees; despite the fact that the trainees were from inadequate background:

> *We found our preschool trainees to be committed during field practicum, though they complained about lack of resources in preschools. Given their background limitation (as they are coming from grade 10 or 12) as well as their joining of the training because of lack of other opportunities, their performance as a result of the training they got from the College is promising (D03).*

Issues pertaining to competence of trainees were sidelined in the descriptions above. Attempts were also made to find excuse in the background of the trainees. Further, performances were gauged not against requisite teacher competencies but in reference to entry behaviors. In fact, descriptions that came in from the remaining others spoke against the contribution of the college training for producing competent preschool teachers (D02; D06; D07).

Entry behaviors of the majority of candidates being low as presented earlier, the design of the program not being relevant in preparing the trainees to work with children (D01; K10; H1; K09), limitedness of the number of courses directly related to preschool education or child development and education (D02) were repeatedly presented earlier. The general structure and implementation of the training program (H12, H13) including the pedagogy that is theoretical and lecture-based than practice-based (D05) were also mentioned as pitfalls. In an extreme way, interviewees from two colleges underscored that even the former one-year training program that they had was better than the current two-years diploma program in terms of design (K10) and delivery *(D04)* suggesting that it is not the duration but the nature of provision of the training that matters the most. According to a participant,

> *The department was able to produce effective teachers in those certificate-level training years. But, the quality of graduates begun to decline once the diploma program set in…almost all the courses in the certificate program were highly relevant and training was practical. Now, there are lots of problems that hinder our effort to produce qualified and effective preschool teachers (K10).*

This perceived limited contribution of colleges in preparing teachers would surly become frustrating to the genuinely committed educators. For example, one such educator gave a scathing comment, "If I say that the diploma module is killing the generation, I am not exaggerating; we are now re-training them after graduation" (D04).

We can add other issues captured from the interviewees that include conditions before graduation in colleges in terms of attention given to the program *(K09),* perceived work conditions after graduation and the preschool work environment not encouraging (K09), or affect the trainees' motivation and moral *(K08);* as the chances of getting further education opportunities are slim (K08; K09; K10); and, therefore, trainees are to continue to be preschool teachers at the same level(K09).

The general message seems to portray that the process of preschool teacher education in colleges does not seem to produce competent graduates. Now, we need to take the perspectives of trainees in terms of knowledge level, development of positive attitudes towards the profession and self-efficacy about their competencies.

Knowledge

Fourteen –items knowledge questions were presented to the trainees and the summary of their replies are presented in Table 3. As it can be referred into this table, the minimum score is 4 and the maximum is 14; the average being 8.2.

Table 3

Descriptive Statistics of Students' Scores on Knowledge, Attitude and Self-Efficacy Items (N=66)

Domains of mastery	Number of items	Response format	Expected min, max and mean score	Observed scores		
				Min	Max	Mean
Knowledge	14	Forced-choice questions	0-14 (7)	4	14	8.2
Attitude	9	Five point rating scale	9-45 (27 or 3 in a five point scale)	17.00	45.00	32.65
Self-efficacy	12	Five point rating scale	12-60 (36 or 3 in a five point scale)	22.00	48.00	41.32

Attitude

The attitude score in Table 3 shows performance above the mid rating point which is closer to 'agree' suggesting that favorable attitude towards the profession seems a bit heavier than the unfavorable one.

Self-Efficacy

Self-efficacy is an important variable in teacher development that determines the belief an individual has to carry out the teaching assignment successfully. The responses meaningfully alternate between sometimes and often, the average being closer to 'often'. This seems a higher score. Perhaps the last unit of analysis is to check the trainees' performances on the three variables; which is graphically presented in Figure 2. As it can be seen in this figure, self-efficacy is higher, followed attitude and then knowledge. It is like the fact that knowledge improves attitude and attitude improves self-efficacy as it was also observed in the correlation index.

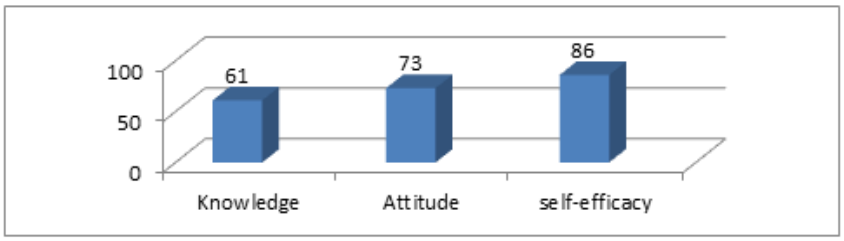

Figure2: Trainees' Performances on the three Measures

Discussion

The quality of preschool teacher education has been repeatedly shown to be a critical factor in building competencies of the professionals and impacting in the long run on the quality of learning and development of the children (Okeke & Drake, 2014; Gui, et al., 2020). The purpose of this study was to investigate the design (curriculum), inputs, delivery (implementation processes), and impacts (competencies of the trainees) of the existing preprimary teacher education program focusing on issues of effectiveness, relevance, coherence, collaboration (Darling-Hammond, 2007), perceived impact, and sustainability. Data presented in the previous section generally indicate that the preschool teacher education program's effectiveness, relevance, coherence and collaboration, impact, and sustainability experienced serious challenges.

Preschool Teacher Training Design, Input and Delivery

The data collected through various sources and analyzed earlier have generally shown that the quality of the curriculum, student and staff entry profiles, and program delivery were inadequate and fettered by various factors. The profile of students and staff did not seem to promise quality because of problems associated with, primarily, the

applicants' pool and the recruitment system and subsequent inadequate support and development services to compensate for these gaps. Curriculum relevance was bitterly critiqued by participants. Preschool teacher training internal coherence was seen to lack connection between stipulated objectives and courses, and courses and delivery mechanisms. External coherences were also critiqued for undue similarity of preschool teacher training to the preprimary teacher education in various forms. Input constraints were so limiting that preschool teacher training was delivered in ways that are minimally aligned with the needs and profile of early childhood education.

Some prior institutional research in the filed in Ethiopia can also invariably substantiate these findings. For instance, the national situation analysis conducted as an input to the formulation of the first ECCE policy in Ethiopia in 2010 has indicated several shortcomings that cast shadows on the professionalism of the preparation of preschool teacher training as well as early childhood education (Tirussew, Teka, Belay, Belay & Demeke, 2009).

This situation assessment unveiled that the major challenges were lack of proper training of preschool teachers; lack of standard curriculum and guidelines; lack of culturally relevant story books; low salary for teachers causing high staff turnover; lack of early childhood education professionals; and the use of foreign languages (mainly English) as a medium of instruction. At about same year, the Addis Ababa Education Bureau (2010) has also indicated that the sector has been suffering from lack of qualified teachers, and basic resources including facilities, equipment, space and physical set up. A study conducted in the Southern Nations, Nationalities and Peoples Region revealed that relevance of the curriculum, availability and qualification of preschool teachers were poor (Shanko et al.2019). One of the areas in which teachers

are supposed to be knowledgeable and skillful is the area of caring for children. A survey conducted in Addis Ababa, Lideta Sub City, indicated that only 40% of preschool teachers were knowledgeable about providing safety and security for children (Ganfure et al., 2018).

While these challenges still persist and affect the ECCE practice negatively, quality preschool teacher training could address at least some of these challenges. But, a more comprehensive national assessment of the education sector of the country conducted nearly a decade later to draw a 15 years national education roadmap has identified lots of implementation problems (curriculum, governance, qualification and morale of the teaching force, facilities and budget etc.) at all levels (preprimary, primary, secondary and tertiary) of the education system of which quality problems in preschool teacher training was one (Tirussew et al., 2018).

A situation analysis was conducted as an input to the 2010 formulation of ECCE policy in Ethiopia. In fact, a more relevant national evaluation of teacher training practices in Ethiopia across modalities has still identified that teacher preparation in Ethiopia including the pre-primary pre-service program (MoE, 2016) has such persistent problems as inappropriateness of the courses, trainees' lack of prerequisite knowledge, inadequate practical activities, and ineffective implementation of active learning (MoE, 2016).

A very recent MoE document on the new teacher education curriculum framework (MoE, 2022) has also come up with a conclusive stance that teacher preparation curricula at different periods failed to play their roles as agents of change and transformation in the field of education and by extension in the society at large

because they have not been based on analysis of the educational needs of the country. In the background section of a very recent MoE document of the new teacher education curriculum framework (MoE, 2022), it is stipulated in a comprehensive manner that that the curriculums developed at different periods failed to play their roles as agents of change and transformation in the field of education and by extension in the society at large because they have not been based on analysis of the educational needs of the country.

According to synthesis report of various studies in this same source, the curriculum in Ethiopia suffered from such drawbacks as: lack of relevance of contents, prevalence of difficult and overloaded contents in textbooks, absence of interactive learner-centered methodologies, improper implementation of continuous assessment, failure to promote and utilize indigenous knowledge, failure to effectively connect education to production, life, practice and work, lack of adequate and appropriate provision for using digital technology, failure to include moral education, and insufficient attention to differentiation. It is also indicated that studies have criticized the teacher education curriculum for making relatively more tilt towards knowledge and information and paying less attention to values and skills. Furthermore, it has been taken as being theory laden which resulted in its dissociation from activities which are practical, productive and socially useful. It is, therefore, important to ensure the prevalence of optimal balance among knowledge, attitude, and skills on the one hand and theory and practice on the other.

Small-scale individual research investigations on different aspects of the teacher education system have also invariably supported these concerns. For instance, as regards curriculum and implementation endeavors, the professional integrity of both

the development processes and implementation of the general education system was brought to question (Yayeh, 2017). A lot of problems were identified affecting the implementation process of curricula materials. Lack of professionalism in curriculum development at all levels and lots of implementation concerns in the education system that include organization and administration problems in the provision of quality education, qualification and professional profile of the teaching and administrative staff, concerns with pedagogical practices and the evaluation system, and undue political control of the education system that deprives personnel the professional right to exercise academic freedom.

In another study (Mulugeta, 2015), it was found that the 2014 curriculum had not been contextualized, problem of alignment between the previous early childhood care and education curriculum and what was being suggested in the early childhood care and education framework, strategy and guideline, the undue emphasis given to supportive courses than to early childhood care and education courses, and the absence of clear difference between practicum and action research courses. Thus, the studies imply that revising the early childhood care and education curriculum must be in line with the national early childhood care and education policy, strategy and guideline. Furthermore, many teachers are not adequately qualified for the level at preschool which they are expected to teach and some qualified teachers are not fairly distributed across regions.

Generally, it can be said that the early childhood education system including preschool teacher training is fettered by challenges and problems related to governance, curriculum, teachers' qualification, location, facilities and budget. With respect to teachers' qualification and benefits, it was found that, despite the fact that preschool

teachers' recruitment, preparation, professional development programs and teachers' salary and benefits are important components of preschool education quality, those components of a preschool education system were not given attention. Many of the preschool teachers are either untrained or very minimally trained to carry out their facilitation role. Preschool teachers' responses regarding their training status showed that the majority had minimal or short-term training and that their qualification is at a certificate level. The facilitators did not pass through any form of formal training except the short-term ones.

Experience also shows that preschool level is given less attention and those who are expected to be preschool teachers are not necessarily required to qualify for the level. The attention given to preschool teacher training, the social status they are accorded, the low payment compared to other teachers and several other factors have contributed to: 1) preschool teacher turnover, 2) lack of competent in-service preschool teachers, 3) lack of attracting competent pre-service preschool teacher trainees, 4) lack of job satisfaction in teachers, etc.

The demography of preschool teachers in Ethiopia is very diverse. The majority of teachers who are teaching in the preschool level are either not formally trained as preschool teachers or are graduates who use preschool teaching job as a temporary pastime until they find a desirable job elsewhere. There are also preschool teachers who are alien to education in general and early childhood education in particular. The case in Addis Ababa reveals that any graduate from any department can teach at preschool level in private preschools, especially if they speak fairly good English. In government preschools, any form of certification is enough to be a preschool teacher. At times,

grade teachers who have disciplinary problems are assigned to teach preschool children as a demotion or disciplinary measure.

The unique nature of training preschool teacher professionals requires examining what is really going on in the training colleges in line with the defined competencies of graduates, the self-efficacy and attitude of pre-service preschool teacher trainees, the curriculum content and pedagogy colleges implement to train preschool teachers, the materials and equipment used and other indicators.

In fact, while curriculum formulation initiated in 2014 was consistently revised to the extent that we are now having a new more professional framework tabled for implementation, a question arises as to the quality of the personnel who are tasked for observing the process. If the same task force is yet allowed to continue business as usual, then the curriculum design alone would hardly assist ensuring quality outcome in exactly the same manner that holding a new wine with an old sack would hardly ensure a desired change.

Perceived impacts and sustainability

Given all the challenges presented above, one would then fairly imagine that the perceived impacts of preschool teacher training on trainees' knowledge, skills, attitudes and self-efficacy are likely to be inadequate. It is not only the problem of adequacy of impact, but also sustainability in the sense that even the changes observed did not seem to sustain beyond immediate benefits because the education process is fact-laden, theoretical, and did not even address the cognitive aspect in the fullest sense. In this regard, reviews of local research on early years education and preschool teacher training summarized earlier have sent supportive evidence from different vantage points that the

required professional competencies of preschool teacher training teachers have been a point of concern for over the last several years (MoE, 2016; Ganfure et al., 2018; Tirussew et al., 2007; Shanko et al., 2019). Evidence seems to suggest that perceived problems are likely to characterize trainee's acquisition of the core knowledge base and practical skills of the developmental profile of the children, contents (concepts, principles and theories) of early childhood care and education, pedagogical methods including play-based pedagogy and effective interaction with children, children with special needs and issues of assessment. Logically, then, a lot more other core competencies of preschool teacher training teachers (National Research Council, 2015) can hardly be cultivated if these foundational ones are inadequate. Of critical ones among those not adequately cultivated can be competencies in working with diverse populations of children, promoting integration and cohesiveness, valuing, using and providing opportunities for children's capability and experience (Hatton & Smith, 1995).

Conclusions

The curriculum was severely critiqued for lacking relevance, appropriateness, and usefulness to the level. Pedagogical approaches were also indicated to be theoretical, lecture-based and not student-centered. Trainers' professional competences in the colleges did not seem to guarantee provision of services that make up competent graduates. A number of other problems were documented challenging the efficacy of this program.

Recommendations

Six major actions points are recommended to address the gaps noted in the short-and-long terms: 1) Stakeholders need to work towards the professionalization of the field of preschool education at all levels. 2) Revise rules, laws and procedures, and tools that jeopardize the professional practice of preschool teacher education. 3) Improve existing. 4) Institute and/or strengthen the resource base of the colleges. 5) Augment preschool teacher education by establishing model-off campus preschool center closer to each college. 6) Introduce new initiatives that scaffold preschool education as a national program.

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Social Intelligence and Psychological Adjustment as Predictors of University Students' Intercultural Competence

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Abstract

The importance of intercultural competence has been steadily increasing. The need to develop intercultural capabilities in multicultural countries has become even more pressing than before. This study aimed to investigate the impact of social intelligence and psychological adjustment on the intercultural competence of university students. The study employed a correlational survey design. Data were collected from 476 (Male=244 and Female= 232) randomly selected Ambo University students. The data were analysed using regression and multivariate analysis of variance. The *regression result showed that class year (β=.809, p<.001), the number of language students experience (β=.801, p<.001), social intelligence (β=.553, p<.001), and psychological adjustment (β=.206, p<.001) all had a substantial contribution to intercultural competence. The finding indicated that 70.4% of the variance in intercultural competence was accounted for by the linear combination of student's class year, the number of languages, social intelligence and psychological adjustment. The result have also shown that students' class year accounted for the highest (68.7%) variation in intercultural competence followed by the number of languages spoken, social intelligence and psychological adjustment. Furthermore, significant differences in students' intercultural competence were observed due to sex and cultural experiences before joining the university. However, there was no significant mean difference in students' intercultural competence as a function of their family structure. Generally, based on the findings of the study, some practical implications, and future direction for further research are suggested.*

Keywords: *Intercultural competence, social intelligence, psychological adjustment, university students, Ethiopia*

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Introduction

Intercultural competencies have become crucial in today's globalized world as they are essential for various aspects of human lives such as learning, working, resolving conflicts, and effectively engaging with individuals from diverse eco-cultural backgrounds (Odağ et al., 2015). The 21st-century global situation is becoming increasingly multifaceted and interrelated. The steps and processes taken to address these challenges resonate worldwide. In the current era of virtual age and rapid globalization, university students have to cultivate intercultural competencies (Jones & de Wit, 2012). Moreover, the significance of intercultural competence is particularly pronounced during the university years as it is a crucial stage of personal growth where students shape their identities in relation to others and navigate diverse social dynamics before making long-term commitments to various aspects of life (Gurin, 1999; Gurinet al., 2002).

This makes universities an ideal context for enriching individuals and social competences and exploring their associated factors. According to Fantini (2005), intercultural competence refers to a set of skills and capabilities necessary for individuals to engage in effective and appropriate interactions with others who are linguistically and culturally different from themselves. Intercultural competence can be described as possessing the essential knowledge, awareness, attitude, and skills to understand and navigate one's own culture as well as other cultures, and to adapt one's behaviours accordingly (Bennett, 2011; Berardo, 2005; Deardorff, 2006; Fantini, 2009; Leunget al., 2014). The majority of past studies conducted in Western societies have primarily focused on the development of intercultural competence and related factors, specifically in the context of international or immigrant students studying at host

universities (Deardorff & Jones, 2012; Janelle et al., 2017; Yeke & Semerciöz, 2016). Hence, expanding the scope to domestic student populations could yield important new findings in this area. For instance, Bennett (2011) proposes a conceptualization of intercultural competence that encompasses three dimensions: affective, cognitive, and behavioural skills. On the other hand, Deardorff (2006) indicates that intercultural competence can be understood through five dimensions, namely requisite attitudes, knowledge and comprehension, awareness, desired external outcome, and internal outcome. Furthermore, Byram (2000) introduced another perspective on intercultural competence, which involves five dimensions: attitude, knowledge, interpreting and relating skills, exploring and interacting skills, and critical cultural awareness.

In this study, the researchers utilized Fantini's (2005) multidimensional intercultural competence (i.e., intercultural knowledge, intercultural attitude, intercultural awareness and intercultural skills) model, which is recognized as one of the most comprehensive and widely used frameworks in the field. Intercultural knowledge pertains to an individual's ability to acquire knowledge and relevant information about their own culture as well as the cultures with which they interact. Intercultural attitude refers to an individual's inclination to be open, respectful, interested, and curious about different cultures. Intercultural awareness can be defined as an individual's capability to perceive and understand the similarities and differences between their own culture and other cultures, while maintaining a critical perspective (Byram, 2000; Deardorff, 2011; Fantini, 2005). Intercultural skills encompass a range of abilities, including listening to people from other cultures, observing and understanding different cultural practices, interpreting and analysing cultural phenomena, evaluating cultural perspectives, and establishing connections and relationships across cultures (Fantini, 2005).

In the past, research on intercultural competence has centred around four key factors (i.e., individual, institutional, environmental and cultural variables). Individual factors encompass elements such as personality traits, language proficiency, and communication patterns (Deardorff, 2009). Institutional factors refer to aspects within educational institutions, such as curriculum design, pedagogical approaches, and even the layout of dormitories (Kudo et al., 2019). Environmental factors involve elements like physical proximity, opportunities for social exchange, and the presence of social networks (Odağ et al., 2015). Cultural factors refer to cultural identity, multicultural personality, and the ability to adapt to multicultural environments (Matveev, 2017). Moreover, a number of studies in communication, language, pedagogy, psychology, and social anthropology have made significant contributions to understanding intercultural competence and related factors (Anastasia, 2017; Anteneh, 2012; Fantini, 2005; Martin & Nakayama, 2008; Tong & Chen, 2008). However, most of these studies investigated intercultural competences in relation to immigrants' adjustment and adaptation in foreign countries, their adjustment to work diversity, job satisfaction, and academic performance, among other factors. As a result, elevating the scope to domestic university student of multicultural populations could yield important new findings in this area.

A substantial amount of previous research (e.g., Bosuwon, 2016; Donget al., 2008; Günçavd & Polat, 2016; Nikoopour & Esfandiari, 2017) offers empirical evidences that support the role of social intelligence, psychological adjustment, and certain demographic factors in promoting intercultural competences. As a result, the degree of intercultural competence among university students is associated with their level of social intelligence, psychological adaptation, and certain demographic factors (Guntersdorfer & Golubeva, 2018; Reid, 2013). Intercultural competence plays a vital

role in multiple dimensions of life, such as achieving academic success, navigating social interactions, promoting psychological well-being, and effectively addressing challenges encountered within a campus setting (Vegh & Luu, 2019; Wanget al., 2020). These challenges involve matters concerning adaptation, conflicts arising from cultural and ethnic disparities, and the facilitation of constructive dialogues and supportive relationships between students and universities.

Intercultural competence among university students has been linked to various outcomes, both at the intrapersonal and social levels. Research findings suggest that university students who possess high level of intercultural competence tend to experience various positive outcomes (Alabay & Polat, 2016). These include enhanced social intelligence and psychological adjustment, increased exposure to multiple languages and cultures, higher satisfaction with campus life, improved academic achievement, and a reduced likelihood of engaging in intercultural and interethnic conflicts (Bosuwon, 2016; Nikoopour & Esfandiari, 2017; Hiraiet al., 2015; Martinus, 2018; Tuncel & Arıcıoğlu, 2017). However, most of these studies were based on the experiences of international students who had been pursuing their studies in western countries. In the western society, the culture is individualistic, promoting autonomous individuation, whereas in Ethiopia, the culture is typically collectivist, fostering interdependence among individuals (Abebaw, 2014; Anteneh, 2012; Adamu & Zellelew, 2007). Therefore, due to the cultural distinctions between the two contexts, it would be unreasonable to anticipate identical outcomes in the Ethiopian setting as a whole, and specifically among university students.

The importance of understanding the intercultural competence of Ethiopian university students has increased due to the rapid changes in the multicultural makeup of Ethiopian higher education institutions. This has led to a greater focus on assessing

students' level of intercultural competence and the psychological factors related to it. University serves as a crucial environment for young adults to develop academically, socially, linguistically, psychologically, and personally (Abebaw & Tilahun, 2007; Chiu et al., 2013). University provides students with new opportunities to enhance their skills and prepares them for future social and personal responsibilities (Griffith et al., 2016; Janelle & Tenzin, 2017). Conversely, universities in Ethiopia are known as environments where ethnic tensions and intercultural conflicts manifest as significant battlegrounds for students (Ashebir & Belay 2020; Adamu, 2013; Tariku & Gara, 2016). Therefore, gaining a research-based understanding of intercultural competence and the related psychological factors could serve as a valuable tool for effectively addressing campus diversity and managing the challenges posed by ethnic and intercultural tensions. This implies that in Ethiopia, as far as the knowledge of the researchers is concerned, there was no adequate research evidence concerning the role of social intelligence, psychological adjustment and demographic variables on university students' intercultural competences. Thus, the contexts in which Ethiopian universities are actually functioning call for a study that examines university students' intercultural competence and associated factors.

Theoretical background of the study

Intercultural competence has been generally conceptualized as the skilful and effective navigation of interactions between individuals who possess diverse affective, cognitive, and behavioural perspectives towards the world (Spitzberg & Chagnon, 2009). In the context of multicultural university students, IC is commonly defined as students capacity to manage their cultural transition, capacity to change one's life course and effective interaction with people from different cultural backgrounds

(Deardorff 2006; Elosúa 2015; Kudo, Volet, & Whitsed 2019). Consequently, the leading intercultural competence research framework was adapted to comprehend important personal, social, psychological and ecological factors in the conceptualization of university students' intercultural competences.

According to Deardorff's (2009) multilevel causal path model, human attributes, ecological/system-level factors, and change processing factors can influence an individual's intercultural competence. There are four underlying principles that can be inferred from Deardorff's (2009) multilevel causal path model. The initial assumption posits that an individual's intrapersonal factors, such as cultural knowledge, motivations, and personality, significantly influence the individual's intercultural competences. The second concept is that interpersonal factors, such as social responsibility, social intelligence, and locus of control, have an impact on individuals' intercultural competence. The third assumption pertains to how change processing factors, such as psychological adjustment, coping with cultural shock, and managing identity change, influence an individual's level of intercultural competence. The fourth assumption emphasizes the influence of ecological and demographic factors in shaping an individual's intercultural competence (Deardorff, 2009; 2011).

Deardorff (2009) proposed a reciprocal relationship between the individual and the intrapersonal, interpersonal, change process, and environmental factors, wherein a university student's intercultural competences are influenced by these factors, and in turn, they also influence these factors. Deardorff's multilevel causal path model focused on how psychological and interpersonal factors, along with environmental variables, contribute to either enhancing or diminishing student's behaviours.

In multi-ethnic, multilingual, and multicultural societies, higher education institutions can indeed play a crucial role in enhancing democratic values, nonviolent

coexistence, and intercultural understanding among students (Abebaw, 2014). Despite the fact that numerous studies have investigated the issue of diversity climate among university students in Ethiopia, none of them have examined the level of intercultural competence and associated psychological factors (Abebaw, 2014; Adamu, 2013; Adamu & Zellelew, 2007; Tariku & Gara, 2016). Evidence also appears that intercultural competence and associated factors among university students in Ethiopia have not been properly addressed (Anteneh, 2012; Mekonnen, 2013). This may be one of the reasons for the existence of several inter-ethnic conflicts among university students in Ethiopia that interrupt the teaching-learning process and healthy functioning of the universities.

Therefore, to narrow the research gaps shown above particularly in the Ethiopian context, the researchers felt that it is worthwhile to investigate the role of social intelligence, psychological adjustment and some selected demographic variables on university students' intercultural competence. This study adopted the multilevel causal path model to gain a deeper understanding of the relationships between these variables. To this end, the following basic research questions are put forward;

- What is the level of students' intercultural competence, social intelligence, and psychological adjustment?
- Are there statistically significant relationships among intercultural competence, social intelligence, and psychological adjustment?
- To what extent is intercultural competence influenced by students' social intelligence psychological adjustment and some selected demographic variables?
- Is there statistically significant mean difference among dimensions of intercultural competence as a function of participants' sex, family structure and type of culture the students lived in before joining university?

Operational Definition of key Terms

Intercultural competence: is defined as university student's knowledge and ability to successfully deal with intercultural encounters as measured by Fantini's (2005) intercultural competence measuring scale.

Social intelligence: Defined as young adult's ability to understand others; one's own social interactions and apply this knowledge in leading and influencing others for their mutual satisfaction as measured by Silveraet al. (2001) Social Intelligence scale.

Psychological adjustment: is defined as the general feeling of welfare and contentment that one can experience because of lessening of stress in the new eco-culture contexts as measured by Othman et al., (2014) psychological adjustment measuring scale.

Methods

Study Design

The study employed a quantitative approach utilizing a correlational research design to explore the relationships between multiple variables. Specifically, the research aimed to examine the associations between students' class year or batch, intercultural competence, social intelligence, and psychological adjustment. According to Creswell (2012), correlational research design is a predictive approach that allows researchers to investigate the strength and direction of relationships between two or more variables. Identifying these associations, the study provides insights into how these variables interact and contribute to university students' intercultural competence.

Participants of the study

The study took place at Ambo University, Oromia, Ethiopia. According to the data gathered from Ambo University Registrar and Alumni Director's office, the study population consisted of 18,458 (M=10,182, F=8276) undergraduate students. The sample size determination was carried out using the approach proposed by Krejcie and Morgan (1970). Accordingly, a total of 476 (Male=244, Female=232, M_{age}= 22.35 years, SD=2.989) participants were chosen from the overall population utilizing a stratified random sampling technique. The sample was taken from five different colleges, with the following proportions: 156 (32.77%) from College of Medicine and Health Sciences, 119 (25%) from Institute of Technology, 114 (23.95%) from College of Business and Economics, 45 (9.45%) from Institute of Education and Behavioural Science, and 42 (8.82%) from College of Social Sciences and Humanities. The inclusion criteria consisted of regular undergraduate students who were in their 2nd year or higher and demonstrated a willingness to take part in the study.

Following scholars' suggestion (e.g., Byrne, 2016; Hair et al, 2014), the total sample (N = 476) of the study was divided into two equal smaller samples (i.e., n = 238 each). The first sample of 238 participants was then used for the purpose of Exploratory Factor Analysis (EFA) whereas the second sample of 238 participants was used for the purpose of Confirmatory Factor Analysis (CFA). The validation process yielded the final Amharic version scale with 30- items, after discarding several items (see Tessema & Seleshi, 2024).

In the present study, we used the large sample (N = 476) to answer research questions other than those that focused on the instrument validation. This practice is supported by several scholars. According to Worthington and Whittaker (2006) and Hinkin (1995), for example, after initial EFA and CFA, the full dataset can be used for

further validation and other research goals. Likewise, other scholars (e.g., Clark & Watson, 1995; Devellis, 2006) recommend the use of the full dataset after EFA and CFA for comprehensive validation and other research objectives. It is following these suggestions that we merged the two smaller samples used for EFA and CFA, exclude all items which were rejected in the validation process and used the full dataset to answer research questions other than those pertaining to the instrument validation.

Measures

In the present study, a questionnaire, comprising four sections, was employed to collect data. Whereas the first section contains items on demographic factors including (i.e., sex, ethnicity, class year/batch, perceived types of culture lived before joining university and linguistic proficiency). The remaining three were scales on intercultural competence, social intelligence and psychological adjustment.

Intercultural Competence; the intercultural competence scale (ICS; Fantitni, 2005) was adapted and utilized to measure university student's intercultural competence. Originally the scale has 50 items with four subscales (intercultural knowledge, attitude, awareness and skill) are presented as a six-point scale ranging from 0 to 5 (0=not at all to 5=very high). This scale was adapted for use in the Ethiopian context following all the scale adaptation procedures as suggested by several earlier scholars (e.g., Boatenget al., 2018; Lawshe, 1975; International Test Commission (ITC), 2010; Tanzer, 2005). As the norms of the scale, high score indicates higher level of intercultural competence and low score indicates low level of intercultural competence. The Exploratory Factor Analysis (EFA) we conducted produced a four-factor structure like the original version with 55.275% total explained variance (Tessema & Seleshi, 2024). The retained four-factor structure had a factor loading

ranging from 0.448 to 0.781. Similarly, the results of the confirmatory factor analysis (CFA) indicate that the data fit the hypothesized model with excellent convergent and discriminant validity, as well as acceptable goodness-of-fit indices. Further, the pilot study result confirmed that the reliability for each subscales were α=.81 for intercultural attitude, α=.88 for intercultural awareness, α=.84 intercultural knowledge and α=.82 for intercultural skills. This suggested that the adapted measure could be used to assess university students' intercultural competence in the Ethiopian context (Tessema & Seleshi, 2024).

Social Intelligence: in order to measure the social intelligence of the study participants, Silvera, Monica and Dahl's (2001) multidimensional social Intelligence (21-items) scale was translated, adapted and utilized in the Ethiopian context. Originally, the scale is a self-report instrument aimed to measure university students' social information processing, social skills and social awareness with very good psychometric properties. To make the scale valid and reliable for use in the Ethiopian context, both exploratory and confirmatory factor analysis were done based on recommended instrument validation procedures (e.g., Lawshe, 1975; ITC, 2010; Tanzer, 2005). Responses were rated from 1=strongly disagree to 5 =strongly agree. The result of EFA showed three interpretable factors similar to the original version with factor loadings ranging from 0.61 to 0.968. All factors were loaded to the identified factor structure with 74.32% total variance explained. Furthermore, CFA indicates that the data fit the hypothesized model since the analysis confirmed that the model of this study has good construct validity (convergent and discriminant validity) as well as acceptable goodness of fit indices. Moreover, the internal consistency of the factors were found to be good (α=0.828 for social awareness, α=0.845 for social skills and

α=0.935 for social information processing) with significant inter-correlation between the subscales (See Appendix).

Psychological adjustment: Psychological adjustment scale with three dimensions developed by Othman et al. (2014) was validated and utilized in this study to measure the psychological adjustment of university students. The measure comprised of 12 items rated on a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Originally, Othman et al's psychological adjustment scale has three dimensions with acceptable internal consistency (Cognitive adjustment, α =0.81, Affective adjustment, α =0.79 and Attitudinal/behavioural adjustment, α =0.80). High score on each subscale represents high approval of adjustment in each dimension (cognitive, affective and attitudinal). To make the scale valid and reliable in the Ethiopia context, both exploratory and Confirmatory factor analyses were done. The EFA resulted in three interpretable factors like the original version. As a result, items measuring cognitive adjustment had factor loadings ranging from 0.60 to 0.89. Similarly, items measuring students' affective adjustment had factor loadings ranging from 0.53 to 0.85 and items measuring participants' affective adjustment had factor loadings ranging from 0.70 to 0.79. The three replicated factors accounted for 63.69% of the total variance. The results further showed that this scale had satisfactory convergent and discriminant validity with acceptable internal consistency ranging from 0.784 to 0.839, suggesting that the measures could be used to assess psychological adjustment of university students in the Ethiopian eco-cultural context (See Appendix).

Validation of the Instrument

The researchers followed appropriate procedures for instrument translation and data collection. First, they assessed the content validity of the original English version

of the scale with a group of eight experts, following the suggestions of Lawshe (1975). The content validity assessment results indicated that all items of the scales had a content validity ratio (CVR, > 0.75) and content validity index (CVI, >0.90) score exceeding the acceptable thresholds. Secondly, based on the comments and suggestions forwarded by the group of experts essential modifications were made and all scale were retained and translated into Amharic language. Thirdly, translation of the scale from source language into Amharic version was executed through the forward and backward translation protocol recommended by various scholars (e.g., ITC, 2010). Lastly, both exploratory (EFA) and confirmatory factor analysis (CFA) were conducted, and the final, refined instruments have been retained.

Therefore, from an initial set of 50 items measuring intercultural competence, 30 items were retained in the Amharic version of the intercultural competence (ICC) scale. This 30-item ICC scale demonstrated excellent psychometric properties (Tessema & Seleshi, 2024). From an original set of 21 items measuring social intelligence, 17 items were retained in the Amharic version of the social intelligence scale. This 17-item scale depicted excellent factor structure and psychometric properties, as detailed in Appendix. Furthermore, from an original set of 12 items measuring psychological adjustment, all 12 items were retained in the Amharic version with excellent factor loading and psychometric properties (See Appendix).

Procedures

Initially, a support letter was secured from the School of Psychology, Addis Ababa University and given to Ambo University. Before commencing the study, the research project obtained approval and ethical clearance from the Research Ethics Committee of the Department of Psychology, College of Education and Behavioural

Science, Ambo University. The reference number for the ethical clearance is Ref: AU/Psy/Eth Co/011/2022. We obtained permission from the relevant departments, identified the target participants, provided an orientation about the study's purpose, and obtained verbal consent. After obtaining informed verbal consent, the participants received instructions on how to complete the form. They were then provided with a cover letter and the final version of the questionnaire, which explained the research purpose and guaranteed respondent anonymity. Administration of the questionnaires took place during regular class time with close supervisions of the enumerators and researchers. Once the study participants finished completing the self-administered questionnaires within the designated timeframe, the collected questionnaires were examined to ensure they were correctly filled out and prepared for subsequent coding and data analysis.

Table 1

Demographic Characteristics of Study Sample (N=476)

S.N	Demographic variables	Category	Frequency	Percent %)
1	Sex	Male	244	51.3
		Female	232	48.7
2	Ethnicity	Oromo	189	39.7
		Amhara	157	33.0
		Tigre	23	4.8
		Others	107	22.5
3	Class year (batch)	2nd year	83	17.4
		3rd year	224	47.1
		4th year	117	24.6
		5th year	52	10.9
4	Perceived Linguistic proficiency	Monolingual	94	19.7
		Bilingual	235	49.4
		Multilingual	147	30.9
5	Perceived lived culture before joining university	Monoculture	160	33.6
		Bicultural	147	30.9
		Multicultural	169	35.5
6	Family structure	Intact	378	79.4
		Non-intact	98	20.6

As shown in Table 1, the sample comprised nearly equal male (51.3%) and female (48.7%) students. On the other hand, the majority of the participants came from intact families (79.4%), were bilingual (49.4%) and third year (47.1%) students.

Techniques of data analysis

The data analysis was conducted using IBM SPSS version 26.0. Prior to conducting the data analysis, the accuracy of the data entry was assessed by randomly selecting 20% of the total copies of the questionnaire and crosschecking them with the entered data. This assessment showed that the data were accurately entered into the software. In an effort to examine the distribution of the sample and assess the level of intercultural competence, measures such as the mean, standard deviation, frequency, and percentage were utilized. To explore the relationship, contribution, and mean differences among the variables in the study inferential statistical techniques including correlation, multiple and hierarchical regression and MANOVA) were employed. Finally, prior to conducting statistical tests, assumptions of the tests (normality, linearity, homoscedasticity, and multicollinearity) were checked. The results have indicated that the assumptions were tenable.

Results

Level of intercultural competence, Social intelligence and Psychological adjustment

Table 2 presents the average scores of the participants, indicating their levels of intercultural competence, social intelligence, and psychological adjustment. The research results indicate that out of the 476 participants, 47% (n=224) who achieved scores higher than the mean value of 3.40 exhibited a high level of intercultural competence. Conversely, a larger proportion of participants (53%, n=252), scored below the mean (<3.4 mean values), indicating a low level of intercultural

competence as suggested by (Fantini, 2009; Gizem & Soner, 2016). When examining each factor of ICC individually, it was observed that the larger proportion of participants, specifically 58.4% (n=278), demonstrated a low level of intercultural skills in comparison to the other factors. Regarding social intelligence, it was found that 44.54% (n=212) of the respondents displayed a high level of social intelligence whereas 55.46% (n=264) scored below the average, showing a lower level of social intelligence.

When examining each factor of social intelligence, the highest proportion of study participants (56.72%, n=270) demonstrated a low level of social information processing. However, their performance in the other dimensions of social intelligence was relatively close to average or varied. Regarding psychological adjustment, of the 476 respondents, 44.26% (n=211) exhibited a high level of psychological adjustment. In contrast, a larger proportion (55.67%, n=265) of the study participants displayed a lower level of psychological adjustment. In terms of each psychological adjustment dimension, proportionally highest number of low scores was observed on the cognitive adjustment, followed by the behavioural adjustment subscale (see Table2).

Table 2

Level of Intercultural Competence, Social Intelligence and Psychological Adjustment (n=476)

Note: *ICC-intercultural competence, SQ-social intelligence, PsyA- psychological adjustment, SD-standard deviation, Min-minimum, Max-maximum*

Variables	No of items	Freq.	Min	Max	Mean	SD	Percent
ICC-attitude	10	227	12	49	34.5	6.77	47.69
ICC-awareness	7	242	7	35	25.76	6.04	50.84
ICC-knowledge	8	229	6	40	28.32	6.84	48.12
ICC-skills	5	198	6	25	17.97	3.71	41.66
Overall ICC	30	224	45	145	106.16	18.95	47.06
Social awareness	5	219	10	30	21.82	3.67	46.01
Social skill	6	210	7	30	21.85	3.67	44.12
Social information processing	6	206	7	39	24.67	4.04	43.28
Overall SQ	17	212	37	86	68.34	8.26	44.54
Cognitive adjustment	4	201	15	20	18.22	1.31	42.23
Affective adjustment	4	222	10	29	18.26	1.58	46.64
Behavioural adjustment	4	209	13	20	18.72	1.22	43.91
Overall PsyA	12	211	43	66	55.24	2.89	44.26

The interrelationship between the main variables of the study

Table 3 presents the correlations between predictors and outcome variables of the study. The findings indicate that there is a significant positive relationship between intercultural attitude, intercultural awareness, intercultural knowledge, intercultural skill, and overall intercultural competence (ranging from $r = .72$ to $r = .82$, all with $p < .01$). The findings have also revealed that social intelligence has a statistically

significant positive correlation with intercultural attitude ($r = .59$, $p < .01$), intercultural awareness ($r = .40$, $p < .01$), intercultural knowledge ($r = .34$, $p < .01$), and intercultural skill ($r = .30$, $p < .01$). Similarly, psychological adjustment exhibited a significant and positive correlation with intercultural attitude ($r = .25$, $p < .01$), intercultural awareness ($r = .14$, $p < .01$), intercultural knowledge ($r = .16$, $p < .01$), and intercultural skill ($r = .14$, $p < .01$).

After applying dummy coding to students' class year or batch, the results indicate a statistically significant positive correlation with intercultural competence ($r = .81$, $p < .01$), social intelligence ($r = .48$, $p < .01$), and psychological adjustment ($r = .22$, $p < .01$). When investigating the relationship between the various dimensions of the scale, the study found statistically significant positive correlations between the factors of the predictor and outcome variables (ranging from $r = .10$, $p < .05$ to $r = .90$, $p < .01$). These results suggest that university students who possess higher levels of social intelligence and psychological adjustment are more likely to exhibit enhanced intercultural competence and vice versa.

Table 3

Correlation between Predictors and outcome variables of the study (N=476)

Variables	Age	NoL	C/Year	ICCA	ICCAW	ICCK	ICCS	SA	SS	SIP	CA	AA	BA	ICCT	SQT	PsyAT
Age	-															
NoL	.059	-														
C/Year	.082	.893**	-													
ICCA	.092	.705**	.712**	-												
ICCAW	.062	.722**	.725**	.518**	-											
ICCK	.082	.753**	.757**	.459**	.546**	-										
ICCS	.006	.659**	.654**	.415**	.453**	.523**	-									
SA	.072	.488**	.488**	.584**	.349**	.328**	.322**	-								
SS	.028	.216**	.325**	.233**	.334**	.224**	.204**	.316**	-							
SIP	-.32	.358**	.327**	.489**	.289**	.283**	.203**	.491**	.375**	-						
CA	.083	.157**	.160**	.124**	.177**	.180**	.172**	.205**	.120**	.185**	-					
AA	.086	.133**	.133**	.135**	.193**	.193**	.190**	.256**	.185**	.198**	.647**	-				
BA	.048	.212**	.212**	.263**	.152**	.265**	.226**	.240**	.189**	.247**	.756**	.651**	-			
ICCT	.072	.899**	.809**	.770**	.798**	.817**	.717**	.512**	.365**	.423**	.129**	.135**	232**	-		
SQT	.022	.484**	.484**	.585**	.399**	.343**	.300**	.816**	.788**	.809**	139**	.147**	167**	.530**	-	
PsyAT	.091	.223**	.223**	.227**	.160**	.160**	.141**	.312**	.173**	.130**	.733**	.797**	.704**	.217**	.201**	-

**p<.01 (2-tailed). *p<.05 (2-tailed).

Notes: NoL, the number of languages, C/Year: class year, *ICCA-intercultural attitude, ICCAW-intercultural awareness, ICCK-intercultural knowledge, ICCS-intercultural skills, SA-social awareness, SS-social skill, SIP-social information processing, CA-cognitive adjustment, AA-affective adjustment, BA-behavioural adjustment, ICCT-intercultural competence total, SQT-social intelligence total and PsychAT-psychological adjustment total.*

Results of regression analysis demonstrating the role of independent variables in predicting university students' intercultural competences

As shown in Table 4, students' class year (after dummy coding) significantly and positively predicted intercultural attitude (β=.712, P<.001), intercultural awareness (β=.725, P<.001), intercultural knowledge (β=.757, P<.001) and intercultural skills (β=.654, P<.001).

Table 4

The results of multiple regression Analysis predicting intercultural competence from students class year, the number of languages, social intelligence and psychological adjustment (N=476)

Predictor variables	Dependent variable (ICC and its subscale)	B	R^2	t	F
Class year/batch	Intercultural attitude	.712	.507	22.086***	487.78
	Intercultural awareness	.725	.525	22.913***	525.01
	Intercultural knowledge	.757	.572	25.22***	636.32
	Intercultural skill	.654	.428	18.823***	354.31
	Overall ICC	***.809***	***.654***	***47.516******	***2257.81***
The number of languages spoken	IC attitude	.705	.497	21.621***	467.458
	IC awareness	.722	.521	22.698***	515.131
	IC knowledge	.753	.568	24.951***	622.566
	IC Skill	.659	.434	19.057***	363.165
	Over all ICC	***.801***	***.642***	***46.761******	***2186.61***
Social intelligence	Intercultural attitude	.585	.342	15.703***	246.59
	Intercultural awareness	.399	.159	9.482***	89.911
	Intercultural knowledge	.343	.117	7.942***	63.074
	Intercultural skill	.300	.090	6.836***	46.734
	Over all ICC	***.533***	**.284**	***13.712******	***188.011***
Psychological adjustment	Intercultural attitude	.227	.051	5.066***	25.668
	Intercultural awareness	.141	.020	3.096**	9.587
	Intercultural knowledge	.160	.026	3.537**	12.511
	Intercultural skill	.147	.029	3.102**	9.622
	Over all ICC	**.206**	**.042**	**4.577*****	**20.947**

Note: ICC- intercultural competence, ***p<.001, **p<.01

Likewise, the number of language spoken by the students positively and significantly predicted intercultural attitude (β =.705, P<.001), intercultural awareness (β =.722, P<.001), intercultural knowledge (β =.753, P<.001) and intercultural skill (β =.659, P<.001). Further, the magnitudes of the beta coefficients indicated that social intelligence predicted positively and significantly intercultural attitude (β=.585, P<.001), intercultural awareness (β=.399, P<.001), intercultural knowledge (β=.343, P<.001) and intercultural skills (β=.300, P<.001) of university students. Moreover, there was an independent significant contribution of psychological adjustment in predicting intercultural attitude (β=.227, P<.001), intercultural awareness (β=.141, P<.01), intercultural knowledge (β=.160, P<.001) and intercultural skills (β=.147, P<.001).

Table 5

*The Results of Hierarchical Regression Analysis Predicting intercultural competence from students' class year, number of language spoken, social intelligence and psychological adjustm*ent (N=476)

Variables entered and interaction	Overall intercultural competence scale					
	R	R^2	R^2 adjusted	$R^2\Delta$	F	F-change
Class year	.829	.687	.687	-	2257.958***	-
Class year, the number of languages	.857	.735	.693	.066	1594.317***	162.333***
Class year, the number of languages, social intelligence	.838	.702	.701	.008	1142.761***	31.828***
Class year, the number of languages, social intelligence, Psychological adjustment	.839	.704	.770	.003	855.317***	1.030*

**p < .01, ***p <.001

The data in Table 5 show that 70.4% of the variance in intercultural competence was accounted for by the linear combination of students' class year, the number of languages they speak, social intelligence, and psychological adjustment. When all the predictor variables were entered into the regression equation sequentially based on their beta weights, students' class year accounted for the highest variation in intercultural competence explaining 68.7% of the total variance [F [1, 474]) = 2257.95, p<.001]. The number of languages they speak was the next significant predictor [(F [1,473]) =162.33, p<.001] of intercultural competence followed by social intelligence [(F [1, 472]) = 31.828, P<.001] and psychological adjustment (F [1, 471]) = 855.317, p<, 01).

Differences in students' Intercultural competence due to their Sex, Family Structure and types of culture they lived in before joining university

In this study, MANOVA was employed to assess whether gender, family structure, and type of culture the students experienced before joining university had any combined effects on overall intercultural competence (combining all four dimensions). Prior to conducting the MANOVA analysis, the statistical assumptions were evaluated, including normality, linearity, multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity. The results have indicated that these assumptions were met and there were no violations detected. The MANOVA results are presented in Table 6 below.

Table 6

The Summary of MANOVA Results for the Main Effects of Sex, Family Structure, and types of culture on students' intercultural competence (N=476)

Effect		Values	F	Hypothesis df	Error df	Sig	Partial Eta. square
	Pillai's Tarce	.169	19.129[b]	5.000	470.000	.000	.169
Sex	Wilks' Lambda	.831	19.129[b]	5.000	470.000	.000	.169
	Hotelling's Tarce	.204	19.129[b]	5.000	470.000	.000	.169
	Roy's Largest Root	.204	19.129[b]	5.000	470.000	.000	.169
	Pillai's Tarce	.006	.540[b]	5.000	470.000	.746	.006
FS	Wilks' Lambda	.994	.540[b]	5.000	470.000	.746	.006
	Hotelling's Tarce	.006	.540[b]	5.000	470.000	.746	.006
	Roy's Largest Root	.006	.540[b]	5.000	470.000	.746	.006
LTC	Pillai's Tarce	.480	29.704	10.000	469.000	.000	.240
	Wilks' Lambda	.530	35.093[b]	10.000	469.000	.000	.272
	Hotelling's Tarce	.870	40.699	10.000	469.000	.000	.303
	Roy's Largest Root	.848	79.686	5.000	469.000	.000	.459
Sex*FS*L	Pillai's Tarce	.014	.795	8.000	924.000	.607	.007
TC	Wilks' Lambda	.986	.795[b]	8.000	922.000	.607	.007
	Hotelling's Tarce	.014	.795	8.000	920.000	.607	.007
	Roy's Largest Root	.013	1.448[c]	4.000	492.000	.217	.012

Note: *FS-family structure, LTC-Lived type of culture before joining university*

The MANOVA results in Table 6 showed that there was statistically significant difference between males and females (Wilks' Lambda=.831, F [5, 470] =19.129, p<.001, partial eta square=. 169) on the overall intercultural competence scale. Likewise, the main effect of the type of culture the students lived in before joining university (Wilks' Lambda=.530, F [10, 469] =35.093, p<.001, partial eta square=. 272) was statistically significant. Focusing only on those statistically significant predictor variables, a follow-up test of between subject effects was conducted in relation to each dimension or subscale of the dependent variable. The results are presented in Table 7 below.

Table 7

Summary table for Test of between subject effects of sex and type of culture the participants lived in before joining university on intercultural competence-subscales (N=476)

Source	Dependent variable	Type III Sum of Squares	DF	Mean square	F	Sig.	Partial Eta. Square
Sex	ICCA	563.905	1	563.905	17.724	.000	.037
	ICCAw	110.524	1	110.524	4.647	.032	.010
	ICCK	291.561	1	291.561	9.331	.002	.020
	ICCS	161.510	1	161.510	11.007	.001	.023
TC	ICCA	2886.921	2	1443.461	45.370	.000	.164
	ICCAw	3229.364	2	1614.684	67.891	.000	.226
	ICCK	3111.694	2	1555.847	49.791	.000	.177
	ICCS	841.460	2	420.730	28.674	.000	.110

***Note**: TC-=types of culture lived before joining university, ICCA= intercultural attitude, ICCAw= intercultural awareness, ICC= intercultural knowledge, ICCS = intercultural skill*

The results in Table 7 indicated that there was statistically significant mean difference in students intercultural attitude (F (1, 464) = 17.724, p < .001, η^2 = .037), intercultural awareness, (F (1, 464) = 4.647, p < .05, η2 = .010) intercultural knowledge (F (1, 464) = 9.331, p < .05, η^2 = .020) and intercultural skill (F (1, 464) = 11.007, p <

.05, η^2 = .023) as a function of their sex. This implies that 3.7% of the students' intercultural attitude was predicted by their sex followed by 2.3% of intercultural knowledge, 2% of intercultural skill and 1% of intercultural awareness. Tukey's post hoc multiple comparison analysis revealed that the mean scores of intercultural competence subscales for female participants are significantly higher than those of male respondents. Similarly, there was a statistically significant mean difference in intercultural attitude, awareness, knowledge and skill between respondent's types of cultural experiences (i.e., mono culture, bicultural and multicultural). As seen in Table7, the step-down analysis showed that the highest significant differences were in intercultural awareness (F [2, 464] = 67.891, p < .001, η^2 = .226), followed by intercultural knowledge, (F [2, 464] = 49.791, p < .001, η^2 = .177), intercultural attitude (F [1, 464] = 45.370, p < .001, η^2 = .164), and intercultural skill (F [1, 464] = 28.674, p < .001, η^2 = .110). The mean scores on intercultural competence dimensions of the respondents who reported to have been in a multicultural context were significantly greater than the mean scores of those who grew up in bicultural or mono cultural contexts before joining university.

Discussion

The aim of the present study was to investigate the extent to which social intelligence, psychological adjustment, and selected demographic variables predict the intercultural competence of university students. When the number of cases who scored above the mean values is considered, a larger proportion (53%) of the respondents demonstrated a relatively low level of intercultural competence whereas slightly below one-half (47%) of the participants had a high level of intercultural competence. Looking at each factor of ICC, the largest proportion of participants (58.4%) reported low level

of intercultural skill. This implies that although the students reported to have better intercultural awareness and knowledge, the majority of university students in Ethiopia do not have the skill to engage with students out of their cultural backgrounds (out-group). This result is consistent with qualitative studies done by Anteneh (2012) and Mekonnen (2013), which found poor intercultural communication competence among university students in Ethiopia. This phenomenon can be explained by ethnocentrism, a dearth of intercultural exchanges, and the apprehension of facing discrimination within their own ethnic communities. However, some studies conducted elsewhere on international university students have revealed high level of intercultural competence (Alabay & Polat, 2016; Bosuwon, 2017; Deardorff, 2011). This contradictory result may be due to the nature of respondents and cultural or national origin. That is, whereas the participants of the present study were domestic university students, the other studies investigated the issue with international students who have high international exposure. Supporting this argument, some past studies have documented that international students have significantly higher level of intercultural competence than domestic students (McMurray, 2007; Lyttle et al., 2011; Chocce et al., 2015).

Regarding social intelligence, 55.46% of the participants were found to have low level of social intelligence (considering the mean score as a cut-off score that separates high and low levels of social intelligence). The finding is consistent with the study conducted by Raziq and Shukla in (2023) on university students, indicating that larger number of participants was found to have either a medium or low level of social intelligence. Furthermore, the findings from the studies by Chettri (2016) and Malik et al. (2018) also indicate that the majority of college students possess a moderate to low level of social intelligence.

Concerning psychological adjustment, the study's results indicated that 55.67% of the participants have low level of psychological adjustment. Yuko et al. (2021) and Wang and Zhangm (2015) also reported similar results, suggesting that college students face an elevated vulnerability to psychological distress, which indicates a lower level of psychological adjustment. In summary, the study clearly showed that most of the students possess lower levels of intercultural competence, social intelligence, and psychological adjustment. The results point to the need for the universities to work on enhancing students' adjustment skills by organizing intercultural dialogues and providing training on social skills adjustment.

The correlation coefficients for the study variables showed that there is moderate to high linear relationships between intercultural competence and the number of languages, students' class year, social intelligence and psychological adjustment. According to the results, respondents with a high level of intercultural competence tend to have multi-lingual experience, relatively longer years of education at the university, a high level of social intelligence, and strong psychological adjustment. The findings of the present study assert that students' class year is associated with their level of intercultural competence, implying that as students stayed longer in the university, their level of intercultural competence increases. This finding is in line with previous studies (e.g., Anteneh, 2012; Dinges, 1983; Ganesan & Morales, 2022; Seregina et al. 2019), which demonstrate thatthe more diverse language experiences people have, the higher their level of intercultural competence tends to be. This means that as the students become more proficient in multilingual experience, the higher their level of intercultural competence and integration with people from different eco-cultural contexts. On the other hand, the result of the study indicated that the higher the level of

students' social intelligence and psychological adjustment, the higher their level of intercultural competence.

The results of the present study indicated that a significant proportion of the variance in intercultural competence among university students is explained by their class year (β=.809, P<.001). This clearly shows a strong and statistically significant relationship between students' class year and their level of intercultural competence. The current findings align with previous research findings that highlighted the impact of students' longer experience as university students on their intercultural competence levels (Sandell & Tupy, 2015; Tuncel & Arıcıoğlu, 2017). This consistency across multiple studies suggests a recurring pattern indicating that students' experience as university students can play a significant role in shaping their intercultural competence. Past research (e.g., Okken et al., 2022; Deardorff, 2011) has documented that year level (or the number of years students stay in the university) is significantly important in terms of explaining the variance in intercultural competence. Thus, as students' progress through their senior years, their intercultural competence tends to undergo significant improvement because of the intercultural relations with peers from diverse eco-cultural backgrounds.

The findings of this study also indicated that a significant portion of the variation in students' intercultural competence could be attributed to the number of languages they speak. Approximately 80.1% of the variability in students' intercultural competence could be accounted for by proficiency in speaking multiple languages. Consistent with the findings of this study, Abduh and Rosmaladewi (2018) and Upton (2022) reported that as students' ability to speak another language increases, their level of intercultural competence increases. Further, this finding is similar to the findings

reported by Chen and Hu (2023) and Tiurikova and Haukås (2022), according to whom being proficient in multilingual skills is positively associated with students' intercultural ability. The ability to speak multiple languages, in addition to one's native language, can enhance an individual's respect and tolerance for diversity (Berry et al., 2002; Chao et al., 2011; Ruben, 1989). This, in turn, can lead to improved intercultural competence. Promoting students' multilingual skills can be facilitated through the implementation of educational policies and political structures that prioritize the use of multiple languages to cultivate intercultural competence among students.

Regarding the effect of sex, the result of this study revealed that sex of participants had significant effect on their intercultural competence. More specifically, female students' intercultural competence score was higher than that of male students. This finding is consistent with that of previous studies (Amanda et al., 2017; Chen & Hu, 2023; Gonzales, 2017; Trond & Niels 2019). This means that female students might possess greater motivation to comprehend, value, and embrace cultural differences. In relation to types of culture the students experienced before joining university, the result showed that students from multicultural experience had a significantly better intercultural competence. This implies that the mean score of students' intercultural competence was higher for students who lived in a multicultural context than those students from bicultural or mono-cultural settings. This finding is in agreement with previous studies (e.g., Deardorff 2011; Gonzales, 2017; Schwarzenthalet al. 2020) which showed that students who have multicultural experience tend to have higher level of intercultural competence.

Limitations

The study has a couple of limitations that readers should note. Readers should be cautious when generalizing the results to the entire population of Ethiopian university students. This is because the participants of this study came from only one university, namely Ambo University. Therefore, additional research involving students from diverse universities with different eco-cultural contexts is needed. Furthermore, whereas this study employed quantitative approach, qualitative research or mixed research could also yield results that contribute to a better understanding of students' intercultural competence and its contributing factors. Thus, studying university students' intercultural competence in the country's different regions with the use of mixed research or qualitative research is warranted.

Conclusions and Recommendations

The study findings showed that a relatively larger number of participants reported lower level of intercultural competence, social intelligence, and psychological adjustment. Consequently, universities should encourage organizational transformation that fosters teaching practices embracing cultural inclusivity. They should also facilitate intercultural dialogues, adaptation, and interaction among students from diverse eco-cultural backgrounds. The results of this study demonstrated a range of interrelationships among the major variables, varying from strong to weak. In addition, the hierarchical regression analysis indicated that the factor contributing the most to the differences in intercultural competence among students was their class year (that is, the number of years they stayed in the university). This was followed by the number of languages they speak, their level of social intelligence, and their psychological

adjustment. Thus, being a senior student, having multilingual experience, being socially intelligent, and being psychologically well-adjusted during university life significantly contribute to intercultural effectiveness. The significance of intercultural competence in conflict resolution cannot be overstated as it plays a vital role in enhancing intercultural communication and fostering tolerance towards diversity. As a result, it is imperative for universities to establish approaches that aim at enhancing students' intercultural competence and facilitating their adaptation to multicultural environments.

Authors Contribution: TA: Conceptualization, preparing a draft of the written content, designing the study, collecting data, creating visualizations, develops the methodology, translating instruments, validating the data, and conducting statistical analysis. SZ: conceptualizing, developing methodologies, coordinating, supervising, validating, reviewing, editing, and approving both linguistic and technical aspects. Typically, both authors participate in the review process and provide their approval for the final submission of the manuscript to the Journal of EJoBS.

Ethical Consideration

The present study has had ethical approval from the Ethics Committee of Ambo University, Institute of Education and Behavioural Study and the Department of Psychology (Ref.no. AU/Psy/Eth Co/011/2022). All individuals who took part in the study did so of their own free will and gave their consent verbally after receiving information about the study.

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Conflict of interest

The authors declared no conflicts of interest associated with this study.

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Data Availability

The datasets produced and analysed during the course of this study can be obtained from the corresponding author upon reasonable request.

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Appendixes A

Figure1. Model fit indices for the Amharic version Social Intelligence Scale

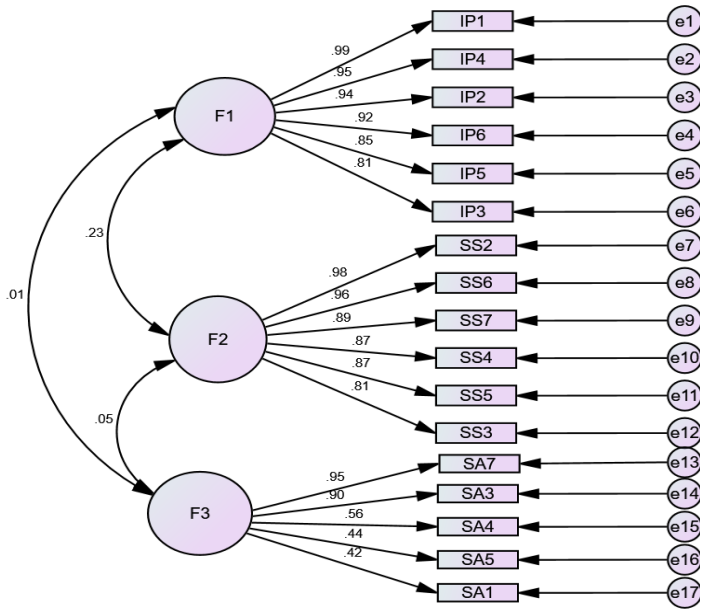
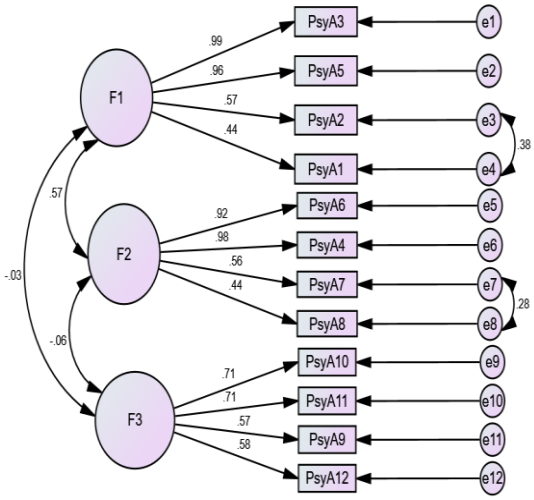


Figure 2. Model fit indices for the Amharic version Psychological adjustment Scale



Appendix B

Summary of the Convergent and Discriminant validity of the three social intelligence subscales- Amharic version (n=238)

SI subscales	CR	AVE	MSV	ASV	SIP	SS	SA
Social information Processing (SIP)	.84	.83	.12	.09	**.91**		
Social skill (SS)	.89	.81	.21	.16	.34**	**.90**	
Social awareness (SA)	.73	.58	.21	.14	.27**	.46**	**.761**

Note. *CR = composite reliability; AVE = average variance extracted; MSV = maximum shared squared variance; ASV = average shared square variance*

Summary of the Convergent and Discriminant validity of the three psychological adjustment subscales- Amharic version (n=238)

S.N	Variables	Subscale	Before running EFA & CFA		After EFA& CFA (Final version)	
			Cronbach alpha	No of items	Cronbach alpha	No of items
		Information Processing	.788	7	.935	6
	Social	Social Skill	.810	7	.845	6
2	Intelligence	Social awareness	.833	7	.858	5
		Overall Reliability	**.865**	**21**	**.897**	**17**
		Cognitive adjustment	.821	4	.839	4
	Psychological	Affective Adjustment	.777	4	.784	4
3	adjustment	Behavioural adjustment	.768	4	.824	4
		Overall Reliability	**.879**	**12**	**.924**	**12**

SI subscales	CR	AVE	MSV	ASV	CA	AA	BA
Cognitive Adjustment (CA)	.78	.68	.15	.10	**.82**		
Affective Adjustment (AA)	.74	.58	.14	.11	.24**	**.76**	
Behavioural Adjustment (BA)	.76	.56	.08	.06	.38**	.29**	**.75**

Note. CR = composite reliability; AVE = average variance extracted; MSV = maximum shared squared variance; ASV = average shared square variance

Appendix c

Reliability Coefficients of the Scales before and after EFA and CFA

S.N	Variables		Before running EFA & CFA		After EFA& CFA (Final version)	
		Subscale	Cronbach alpha	No of items	Cronbach alpha	No of items
2	Social Intelligence	Information Processing	.788	7	.935	6
		Social Skill	.810	7	.845	6
		Social awareness	.833	7	.858	5
		Overall Reliability	**.865**	**21**	**.897**	**17**
3	Psychological adjustment	Cognitive adjustment	.821	4	.839	4
		Affective Adjustment	.777	4	.784	4
		Behavioural adjustment	.768	4	.824	4
		Overall Reliability	**.879**	**12**	**.924**	**12**

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Validation of the Tromso Social Intelligence Scale (TSIS) in the Ethiopian Context

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Abstract

This study aimed to validate the psychometric properties of the Tromso Social Intelligence Scale (TSIS) in its Amharic version. Employing a random sampling method, year three and above undergraduate public university students (n = 343) in the full-time academic program of Dire Dawa and Wollo universities participated in the study. We examined factor structure, model fitness, reliability, and validity of the construct. After removing two poorly functioning items, the result of exploratory factor analysis showed that the measure is a three-factor structure: social information processing, social skills, and social awareness. The result of the confirmatory factor analysis revealed that all the observed variables were significantly represented by their latent variables. A good model fit was finally obtained as indicated in a relative chi-square test (x^2/df = 1.576), IFI = .968, TLI = .962, NFI = .917, CFI = .968, RMSEA = .058 (PCLOSE = .178), SRMR = .053. The explained variance ranged from 22.4% (social information processing) to 72.6% (social awareness). Internal consistency reliability of the social information processing, social awareness, and social skills factors yielded .94, .91, and .92 respectively. The average variance extracted (AVE) was also found to be .67, .66, and .65, indicating convergent validity. The square root of AVE was .82, .81, and .80, confirming the discriminant validity of the measurement model. The overall result of the study demonstrated that the Tromso social intelligence scale is reliable and valid enough to measure social intelligence among senior undergraduate students of Ethiopian public universities.

***Keywords*:** Tromso Social Intelligence Scale (TSIS), social intelligence validation, social intelligence Amharic version

Introduction

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The rising curiosity in exploring new types of intelligence has resulted in discovering new and specific forms of intelligence, such as Cultural Intelligence (Earley & Ang, 2003), Practical Intelligence (Sternberg et al., 2000; Wagner & Sternberg, 1985), Emotional Intelligence (Bar-On, 2000; Mayer & Salovey, 1993), Fluid and Crystallized Intelligence (Cattell, 1987), and Social Intelligence (Thorndike & Stein, 1937, cited in Weis & SuB, 2005). Even though its inception dates back to the 1920s, social intelligence has recently become a relevant area of study that takes many researchers' attention (e.g., Boyatzis, 2009; Boyatzis, et al., 2014; Durlak et al., 2011; Honeywill, 2016; Zautra et al., 2015, 2016).

Social intelligence is viewed as a type of intelligence that refers to people's capacity to understand others and behave (or act) accordingly in relationships. A comprehensive description given by Moss and Hunt (1927, p.108, cited in Lacanlale, 2013) about it said "the ability to get along with others." Honeywell (2015) described social intelligence further as the capacity to navigate complex social relationships and environments.

Social intelligence plays a significant role in helping us understand the complexity and subtlety nature of both individual and group behavior. It is also an essential capacity to understand both implicit and explicit intentions of individuals and groups. With significantly low levels of social intelligence, it will be challenging for one to explore and find out the commonalities that are embedded in the society, and are governing the society he/she resides in as well. It is for that reason that some scholars (e.g., Habib, et al., 2013; Sternberg, 2004) described social intelligence as an individual's bank of knowledge towards the social matters of society. Indeed, group identities are social matters.

Individuals inherently need to adjust themselves with others in the groups they live in. However, establishing, developing, and maintaining social relations and meeting differences and/or conflicting views in a group is usually one of the challenges for many people in a society. Behaving appropriately in a group requires the ability to effectively manage personal and societal changes by developing realistic but flexible coping strategies. In this regard, individuals' level of social intelligence is assumed an important factor because it influences all sorts of our relationships with others.

In almost every aspect of interactions with others, one needs to utilize his/her abilities of understanding and managing others in his/her social environment. Lacanlale (2013) said:

> *Man needs to become adaptive and flexible in dealing with others to develop healthy and smooth relationships. He needs to develop and possess the capacity and ability to understand and manage other people. He needs to know how to operate and handle various situations, and he should have an idea about the social environment in which he is interacting. To respond to these needs, man's social intelligence is deemed to be important (p.263).*

A country converges with other countries on certain values and diverges on some others (Hofstede, 2001). As a result of the cultural divergence, it is assumed that the psychometric properties of the social intelligence scale and its factor structures are likely to vary. Most of the theories and foundational empirical evidence are American in character (e.g., George Washington Social Intelligence Test [GWSIT], Moss, et al., 1955; Structural Model of Human Intellect: Guilford, 1967; Multitrait-multimethod

[MTMM], Lee, et al., 2002) and are likely to be influenced by the Westerns, more particularly by the U.S. American set of values. Except for the MTMM, these measures of social intelligence also received additional criticism because they measure only the cognitive dimension of the construct, neglecting the behavioral aspect.

According to Hofstede (2001), the US values are characterized by high individualism, masculinity, low power distance, weak uncertainty avoidance, and short-term orientation. Ethiopia, in which this social intelligence scale was tested, is located in East Africa whose cultural values are characterized by collectivism, high power distance, low uncertainty avoidance, feminine, and short-term orientation (Hofstede, 2001). These differences among societies are considered relevant for differences between individuals because they influence even the most personal relations such as love, intimacy, marriage, and the break-up of relationships (Dumont, 1986). People are prone to social conditioning.

From these pieces of evidence, one can conclude that Ethiopia and individualist countries, for example, the US, converge on weak uncertainty avoidance and short-term orientation. Regardless of these convergences, however, Ethiopia and the US diverge on individualism-collectivism, masculinity-femininity, and high-power distance, low-power distance.

Therefore, as there are similar universality components and psychological meanings that human beings share because social psychological phenomena are universal across cultures (e.g., Norenzayan & Heine., 2005), there are also social behaviors that are likely to be different in proto-individualist, collectivist, and neo-individualist societies (e.g., Darwish & Huber, 2003) for different underlying factors such as values. Hence, these differences in values are likely to cause variations (1) in

the structure and organization of the social intelligence model, (2) people's prototype and ideal social intelligence, and (3) the pattern of relationships of the social intelligence factors with each other and with outcome variables. As part of a measure of one of the types of human intelligence, therefore, the TSIS constitutes these divergent and convergent elemental natures of human behavior across settings. Consequently, the study examined whether the TSIS items and factors share similar (a) factor structure (b) magnitude or strength of relationship, and (c) direction (pattern) of relationship with each other and with outcome variables on the data obtained from young public university students of Ethiopia.

Based on the aforementioned arguments about the current study and the general theoretical, conceptual, and empirical accounts presented in the Literature Review section (see below) of the social intelligence construct, the validation study aimed to meet the following specific objectives:

- Assess the relevance of the TSIS items of the Amharic language version.
- Examine the factor structure of the TSIS of the Amharic language version in a new setting.
- Investigate the pattern of relationships of the factors with each other in the Ethiopian context and validate the hypothesized model.
- Examine and determine the reliability and validity of the TSIS of the Amharic language version.

Literature Review

An overview of the general definitions of intelligence was given by Sternberg and Berg (1986) who presented the results of two symposia on intelligence that were held in the years 1921 and 1986. They stated that, in these symposia, the main protagonists of intelligence research were asked. In the second symposium, for example, answers were manifold and ranged from intelligence is "what is valued by culture" to "speed of mental processing" with a maximum agreement for the definition of "higher level components of abstract reasoning, representation, problem-solving, decision making" (p. 158).

In both symposia, as Sternberg and Berg (1986) revealed, there was interest in the extension of existing intelligence concepts. The real-life manifestations of intelligence were of interest to the participants. Furthermore, the extension of intelligence has been the topic of large amounts of diversely oriented efforts, among them the convention of reputable experts in intelligence research for a symposium on the 3rd International Spearman Seminar, held at Sydney, in the year 2001, on The Enhancement of Intelligence. The contributions at this symposium reflected the diversity of extensions to intelligence concepts ranging from reductionist approaches to a "trend of diversification" (Weis & SuB, 2005, p. 109). At the other end of the spectrum, the introduction of a new ability construct represents an attempt to diversify the field of human intelligence.

When Edward Thorndike first proposed social intelligence in 1920, his goal was to go beyond conventional notions of intelligence. Compared to academic intelligence, the operationalizations of social intelligence contained additional or distinct criteria than just cognitive requirements. The diversity of approaches resulted in limited progress in establishing social intelligence as a meaningful and unitary

factor of human abilities. Moreover, the unsystematic use of definitions and measurement concepts resulted in legitimate skepticism of some authors (e.g., Ford, 1994) about whether to specify social intelligence as a performance or ability construct. Consequently, scholars began examining the relations between social intelligence and other comparative concepts such as competence, performance, abilities and skills, etc. These concepts are presented comparatively with social intelligence hereunder.

The expressions intelligence and competence, for instance, were often applied as synonyms in social intelligence research. SuB et al. (2005b, cited in Weis & SuB, 2005), for example, have identified important distinctions between these two concepts. According to them, competence is specific to different situations and contexts (i.e., in certain applied settings) and more subject to modification and learning than intelligence. Intelligence is comparatively stable over time and seen as hereditary to a substantial extent (Grigorenko, 2000). Thus, social competence can be classified as a socially constructed concept, as it comprises all person-related preconditions to show successful behavior in varying types of applied settings. Moreover, definitions of social competence would vary substantially according to the spectrum of covered human attributes from just one (e.g., management of conflict, communication skills) to a complex interaction of various variables (Weis & SuB, 2005). However, it is pointed out that social intelligence often is a necessary part of competence concepts.

Performance is another concept that is often seen as synonymous with social intelligence. According to Weis and SuB (2005), however, performance indicates the finally expressed behavior (the result) in contrast to the person-related preconditions that "only" enable behavior (the potential). Whether a person is capable of showing

successful or effective behavior is not a direct function of this person's potential (i.e., competence and intelligence) and additionally, it is dependent on certain personality traits (e.g., shyness, altruism, etc.), from moods and current psychological states (e.g., fear, exhaustion), and context variables (e.g., group values), as the authors state. They further elaborate that the distinction between competence and performance is not only theoretical, it is also apparent when distinguishing between potential- and results-oriented approaches used to assess social competence. Contrary to the potential-oriented approaches, results-oriented approaches conceive social competence as effective behavior (the outcome) where effectiveness is determined through the specific properties of the situation.

Last but not least is the distinction between social intelligence and abilities and Skills. Intelligence constructs usually consist of several distinguishable ability factors, for example, reasoning or verbal abilities. Competence constructs also contain cognitive and behavioral skills. According to Scherer (2007), however, abilities represent more general, dispositional capacities. They are "either genetically endowed or acquired over a long period of socialization" (p. 103). Contrarily, skills are, according to Scherer (2007), concrete actions or applications of cognitive operations on concretely defined problems (e.g., driving with a stick shift or applying an algorithm on some new data). Also, skills are acquired in a process of several steps and are finally characterized by an automated series of actions (Ackerman, 1987).

Social intelligence, therefore, includes one or more of the following key components: the ability to recognize, understand, and express emotions and feelings; the ability to understand how others feel and relate with them; the ability to manage and control emotions; the ability to manage change, adapt and solve problems of a

personal and interpersonal nature; and the ability to generate positive affect and be self-motivated (Bar-On, 2000).

Studies on young students have shown the importance of social intelligence for adolescents and young students in their lives. Given the fact that it is very important for their network, affecting positively their day-to-day interactions and future developments (e.g., Laird et al., 2001), there is also a consensus that adolescents with better social intelligence can solve many societal problems and problems related to relationships (e.g., Dodge & Pettit, 2003). Students at the university level will be able to establish new relationships, create additional networks, and maintain their existing ones (Robert, et al., 2013) provided that they are socially intelligent. Also, students with high social intelligence are good at resolving relationship problems when they exist and can manage them smoothly.

According to Davis (2010), social intelligence is one important factor to improve the development of adolescents and their future careers. Those with high social intelligence can be self-motivated to achieve their goals. They are supportive and consistent in their behavior, and also strive to establish new relations for their goals. Hopkins and Bilimoria (2008) also found that social intelligence helps develop and maintain positive relationships and manage disputes among students in a learning environment. It also helps students perform better in their later life out of the academic environment too. Social intelligence is one key factor in solving societal and relational problems. In a country, like Ethiopia, where almost all public universities continue to experience conflicts, and clashes, including brutal killings among students, examining the problem remains vital.

Materials and Methods

Study Design

The study was a non-experimental research, in which a cross-sectional design was employed. We aimed to validate the psychometric properties of social intelligence measures by utilizing the data obtained from young public university students. It employed a quantitative research method to meet its objectives.

Study Participants, Sample Size, and Sampling Procedures

Because social intelligence is assumed to be built up over time through interactions and exposures, the participants we opted for in the current study were senior students who stayed at Dire Dawa University (DDU) and Wollo University (WU) for three years and above. To select these universities, factors related to resource utilization and practicality details, including accessibility, affordability, safety and security matters during trip and data collection were considered. The assumption behind targeting year three and above students was it would help decrease ambiguities related to students' limited exposure and culture-bounded experience concerns, which are taken as the most important issues in understanding the construct. To avoid significant variations among participants in terms of experience and exposure and subsequently to tackle the potential problems associated with inflated gaps in these attributes, we did not include graduate, postgraduate, or non-regular students.

To draw the sample, Yamane's (1967) sample size formula and stratified proportional sample size formula were respectively used, taking the size of the population of the two strata (DDU & WU) as the general population. Thus, the sample size calculation was done based on the formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where,

n is the sample size; *N* is the population size; *e* is the level of precision.

The assumption is that at a 95% confidence level, $p = .05$. The size of the population was 11,359. Thus,

$$n = \frac{11{,}359}{1 + 11{,}359 * 0.05^2}$$

$$\frac{386}{}$$

It is commonly suggested by authors that in proportional stratified random sampling, the sample for each stratum should be proportional to the size of the subpopulation in each stratum. Accordingly, to have a proportional allocation of the sample of participants, the sample size for each stratum was computed by:

$$nk = \frac{Nk * n}{N}$$

Where,

nk is the sample size in each stratum*; Nk* is the size of the sub-population in stratum *k*; *N* is the total population; and *n* is the sample size for the population.

The two universities' population was ((DDU = 6,737) + (WU = 4,622) = 11,359). With a nonresponse rate of 5% (19 + 386 = 405), the sample taken was:

$$\text{DDU} = n_{DU} = \frac{Nk * n}{N} = \frac{6{,}737 * 386}{11{,}359} = 228$$

$$\text{WU} = n_{WU} = \frac{Nk * n}{N} = \frac{4{,}622 * 386}{11{,}359} = 158$$

A total of 405 participants (239 from DDU and 166 from WU) were drawn. From the equivalent number of distributed questionnaires, 348 were

appropriately filled in and returned, while the rest 57 (32 from DDU & 25 from WU) were either not returned or not properly filled in. Three participants were found to be non-Ethiopian and were excluded from the analyses. The validation study was, therefore, initially conducted on a sample of 345 students. This indicates that 85% of the questionnaire was returned, which is considered an excellent rate of response.

By using the specific lottery technique of the random sampling method, we drew the sample from fourth-year students of Psychiatry Nursing, fifth-year students of Electrical Engineering and Architecture, third-year students of Civics Education and Journalism, fourth-year students of Midwifery, and third-year students of Accounting for the 2021/22 academic year at DDU and WU. The data collection was carried out in April and June 2022, with the participants' consent obtained.

Data Collection Procedures

The validation study in general was carried out with different stages, including doing a vast review of related literature initially, developing a plan of action of activities, deciding on the research setting and the target population, dealing with the tool adaptation, translating, and validating, determining sample size and sampling strategies, collecting data and analyzing it, reporting the results and discussing them, and preparing the manuscript for publication.

After going through rigorous adaptation, translation, and content validity assessment (see Instrument Adaptation, Translation and Content Assessment Processes section below), the instrument was finally made ready for data collection. Before leaving Addis Ababa, we held support letters from AAU and sent a copy of each to the already contacted assistant data collectors in advance to fix issues such as gaining access to the study sites, obtaining students' lists from the registrar office or

departments, and scheduling the dates of data collection beforehand. We also obtained an ethical clearance letter from the ethics committee of the School of Psychology.

The data collection task was done by the main researcher and a total of five assistant data collectors at both sites. A general introduction about the aim of the study and instructions on the instrument was given to participants at the beginning of each data collection session. To give protection and assurance for any potential threats, participants were told to generate a three-digit code in a comprehensive rule set by the research team and to write it down on a blank space provided to it. It was planned to use the code given by the participants later on in the coding process as well for a complete and uniform data set. However, the codes given by the participants were not found suitable (for example, the same code was generated by different participants), so we gave a new code at the end.

The data collection was conducted in group sessions, consisting of 20 to 30 participants in a classroom for better administration and maximizing the possibility of getting properly filled-in questionnaires back.

Ethical Considerations

Priority attention was given to ethical issues. We strictly followed and respected the principle of informed consent. We told participants to withdraw if they wanted to leave the study at any time. We gave assurance of protection of confidentiality to the participants and tried to avoid any potential threats that could be caused by being participants as much as possible. Techniques such as keeping the participants anonymous, employing pseudonyms (generated codes), and keeping the data obtained confidential and secure were some of the methods employed to assure safety. Furthermore, we gave attention not to intrude into participants' personal life

issues and any intention of pressuring them to give responses for the mere sake of obtaining information.

Psychometric Properties of the TSIS

The Tromso Social Intelligence Scale (TSIS) self-evaluation measure, which is a multi-faceted social intelligence measure, was developed and validated by Silvera et al. (2001). The TSIS is a 7-point scale degree of agreement ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The higher the score, the higher the level of social intelligence. It consists of 21 items and measures the three social intelligence dimensions– Social Information Processing (SIP), Social Skills (SSs), and Social Awareness (SA) – each of which utilizes seven items. The 21-item measure has been translated into different languages in many countries, subject to validation tests, and its psychometric qualities have been found to range from adequate to excellent (e.g., Dorgan & Cetin, 2009; Gini, 2006; Grieve & Mahar, 2013; Park et al., 2019).

Consequent studies have supported the psychometrics, factor structure validity, and generalizability of the TSIS. The three-factor structure was replicated across multinational samples (e.g., Chater, et al., 2023; Dorgan & Cetin, 2009; Frankovsky & Birkner, 2014; Kyoung et al., 2019). Across studies, the TSIS showed good internal consistency reliability, and acceptable model fit.

To the best of our knowledge, however, the TSIS has not been yet translated into Amharic, systematically examined, and validated for the Amharic-speaking population of Ethiopia, which is estimated to take the highest portion of the population.

Instrument Adaptation, Translation and Content Assessment Processes

We used the Adapted Amharic version of the Tromso Social Intelligence Scale (TSIS). As the data collection instrument was fully pencil-and-paper based, three

main phases (i.e., adaptation, translation and content validity assessment) were carried out to ensure reliability and validity.

The researchers first did the initial adaptation work in light of intelligence theories in general and in the triarchic theory of intelligence in particular. We then gave the instrument to psychology experts for a more robust cross-adaptation and customization purpose to the Ethiopian context. The experts were PhD holders and a few PhD candidates. Definitions of the construct with its dimensions were presented to them. Translation of the adapted measure, which was originally in English as the original measure, into the Amharic language was done. We used bilingual linguistics experts for this particular task. The translation task was carried out before we exposed the instrument to content validity assessment.

The Amharic version of the TSIS, which consisted of 21 items, was then presented to the psychology experts for content validity assessment. The raters were Psychology experts who were bilingual too. They were asked to rate each item on the scale as "Essential", "Useful but not Essential" and "Nonessential." There were no items rated as "nonessential" by them. Nonetheless, there were items rated by the experts as "useful but not essential." We modified these items based on the experts' comments. These specific items were again inspected by one of the language experts for language appropriateness.

We finally employed Lawshe's (1975) content validity ratio formula (CVR) and interpretation to quantify and find out the consensus of the experts. To determine the retention of an item based on its CVR, cut-off values are given. Consequently, the CVR for each item of the measure was found to range from .75 to 1. The Content Validity Index (CVI) of the items on the scale was .95.

Data Analyses

We utilized IBM SPSS version 25 and AMOS 23 software for the statistical analyses. We used descriptive statistics to show basic information regarding the variables. Histogram and Boxplot were used to inspect and find out outlying cases. We employed exploratory factor analysis (EFA) to inspect the factors that underlie the set of items of the social intelligence measure. We applied Oblique rotation because the factors have been theoretically assumed to correlate with each other. Kaiser criterion of extraction of components (i.e., factors with eigenvalues of ≥ 1) was used to determine the number of factors to be retained. To further inspect the number of factors visually, we also used a scree plot.

We employed confirmatory factor analysis (CFA) to investigate and understand the relationship between observed and unobserved variables. We also checked model fitness. The data set was split into two to conduct the EFA and CFA on separate and independent data. We also employed a multiple imputation method to statistically deal with some of the missing values.

Results

Outliers and Missing Values

Before conducting the multivariate analysis, we did data screening and assumption checking mainly. Consequently, we found some outlying cases and missing values at the preliminary stage of the analysis. By inspecting the Histogram and Boxplot, a few data points were found to be outliers (i.e., Code DDU134, DDU198, DDU200, DDU111, DDU202, WU329 & DDU199) on the social intelligence scale. The values of these data points were not considered as they could seriously affect the multivariate analysis and lead to errant data outcomes. The

descriptive statistics result (Table 1) shows that these cases would not have a significant influence on the analysis. The difference between the variables' *Mean* and their *5% Trimmed Mean* cannot be considered as a significantly large amount of variation. This result implies that these outlying cases were not too far from the rest distribution. Therefore, we maintained them in the data set for the analysis.

In the preliminary analysis stage, we also found cases that missed a few items of the measure. However, they were below 5% in terms of item-wise analysis. We statistically manipulated by employing multiple imputation methods on these cases for the multivariate analysis. However, two cases (Code DDU147 & DDU187) that were found with many more missing items (57.14% & 47.61%) respectively from the overall social intelligence scale were removed from the data set. Consequently, the study was conducted on a sample of 343 participants.

Descriptive

A summary of the descriptive information of the social intelligence construct is presented in Table 1 below. For example, for the SIP dimension of social intelligence, we obtained the data from 343 participants, with values ranging scores from 8 to 49, (M = 37.65, SD = 7.81). Likewise, for the SSs and SA dimensions, we found the data from 343 respondents, ranging from 6 to 42 with a mean of 31.03, SD = 7.52, and a mean of 31.22, SD = 6.73 respectively. The scores ranged from 20 to 132, (M = 99.89, SD = 16.64).

The mean age of the participants was 22.05 (SD = 1.30). Twenty-six participants did not state their age. Two hundred thirty-seven (69%) were male, and 105 (31%) participants were female. One participant did not specify his or her sex. Regarding the original area of residence where participants had come from, 133

(38.8%) were from rural and 194 (56.6%) were from urban areas of Ethiopia. Sixteen participants did not respond to the question about their area of residence.

Concerning the family socioeconomic background of students, it was revealed that 35 (10.2%), 56 (16.3%), and 246 (7.7%) participants were from high, low, and medium socioeconomic backgrounds respectively. Six participants did not state about their family socioeconomic status. This descriptive information in percentage was calculated after the two cases, which were found missing cases with 12 and 10 items respectively, were discarded from the data set at the initial stage.

Table 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Age	317	20	26	22.05	1.30	.445	-.192
SIP	343	8	49	37.65	7.81	-.946	.913
SSs	343	6	42	31.03	7.52	-.908	.758
SA	343	6	42	31.22	6.73	-.659	-.077
Overall Social Intelligence	343	20	132	99.89	16.64	-.958	1.450

SIP = social information processing; SSs = social skills; SA = social awareness. 5% Trimmed Mean of SIP = 38.16; SSs = 31.53; SA = 31.52; overall social intelligence = 102.

Table 1 depicts the distribution of the data, presenting the 5% trimmed mean, skewness, and kurtosis values. The difference between the mean and the trimmed mean of each of the social intelligence dimensions was not large.

Hair et al. (2010) pointed out that skewness between -2 to +2 and kurtosis between -7 to +7 of a data set is considered normally distributed. Curran et al. (1996)

suggested normality thresholds of 2.0 and 7.0 for skewness and kurtosis respectively when assessing multivariate normality such as factor analyses and MANOVA.

Exploratory Factor Analysis Result

We employed exploratory factor analysis to examine the pattern of the newly adapted and translated items and to test the stability of the factor structure from sample to sample and to validate prior studies' results. Before running the exploratory factor analysis, we checked the sample size, correlational strength of the items, linearity, and the presence of significant outliers to know the appropriateness of the data for the analysis. Two items were found poorly functioning items. Before these items were removed, the KMO value was .868 and Bartlett's Test of Sphericity was $p < .05$. When the items were deleted, the KMO value reached .869 with the Bartlett's Test of Sphericity at $p < .05$. According to the KMO model, values less than 0.6 show the sample is not likely sufficient and other remedial actions are required. If the KMO value is less than 0.5, the data undoubtedly won't be very suitable for factor analysis (Shrestha, 2021). The significant value < .05 indicates that the set is very suitable for the analysis. Therefore, the results in the present study indicated that the data set was appropriate for the exploratory factors analysis.

We inspected the correlation coefficient matrices before and after the poor items were removed (see Table 2 & Table 3). The result of the inspection of the correlation coefficients matrix, after the poor items were deleted, revealed that the majority of correlation coefficients were greater than .2 in the scale and greater than .5 in their respective factors (see Table 3).

We used Kaiser's criterion to retain factors that could be extracted for additional securitization. Consequently, factors that had an eigenvalue of ≥ 1 were

maintained. We also used a scree plot to depict the shape of the plot visually along with Kaiser's criterion. The result of the scree plot revealed that the slope of the curve was levelled off between the third and fourth factors, showing first three factors explained more of the variances than all the rest factors (see Figure 1).

Table 2

Correlation Matrix of the Social Intelligence Scale Before Poor Items Discarded

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. SIP1	-																				
2. SIP2	.70**	-																			
3. SIP3	.80**	.71**	-																		
4. SIP4	.69**	.67**	.72**	-																	
5. SIP5	.73**	.66**	.75**	.80**	-																
6. SIP6	.65**	.66**	.63**	.74**	.76**	-															
7. SIP7	.62**	.61**	.67**	.672**	.74**	.81**	-														
8. SS1	.17*	.07	.22**	.19*	.21**	.14	.25**	-													
9. SS2	.19*	.08	.22**	.21**	.19*	.15	.22**	.70**	-												
10. SS3	.30**	.22**	.30**	.27**	.31**	.25**	.28**	.63**	.65**	-											
11. SS4	-.13	-.12	-.12	-.21**	-.13	-.16*	-.18*	-.38**	-.29**	-.31**	-										
12. SS5	.19*	.06	.16*	.24**	.20*	.14	.13	.57**	.54**	.63**	-.34**	-									
13. SS6	.31**	.18*	.32**	.36**	.33**	.23**	.29**	.55**	.70**	.65**	-.29**	.68**	-								
14. SS7	.26**	.10	.29**	.24**	.26**	.20*	.21**	.60**	.55**	.55**	-.33**	.66**	.72**	-							
15. SA1	.16*	.04	.17*	.16*	.19*	.13	.22**	.22**	.15	.20*	-.04	.22**	.24**	.25**	-						
16. SA2	.14	.12	.20*	.15*	.16*	.16*	.17*	.27**	.20**	.30**	-.06	.32**	.27**	.25**	.65**	-					
17. SA3	.10	.07	.20**	.10	.14	.15	.14	.28**	.17*	.32**	-.05	.32**	.28**	.30**	.59**	.66**	-				
18. SA4	.04	.01	.09	.04	.08	.06	.08	.12	.07	.13	.05	.20	.10	.12	.56**	.55**	.58**	-			
19. SA5	.01	-.03	.04	.04	.06	.04	.12	.30**	.09	.20**	-.03	.29**	.17*	.26**	.59**	.62**	.63**	.52**	-		
20. SA6	.13	.082	.13	.10	.13	.13	.16*	.24**	.14	.25**	-.02	.24**	.21**	.22**	.57**	.77**	.59**	.61**	.61**	-	
21. SA7	-.07	-.16*	-.06	-.10	-.08	-.06	-.05	-.16*	-.02	-.12	.18*	-.20*	-.14	-.25**	-.21**	-.13	-.17*	-.15	-.26**	-.09	-

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed); SIP = social information processing; SSs = social skills; SA = social awareness.

Table 3

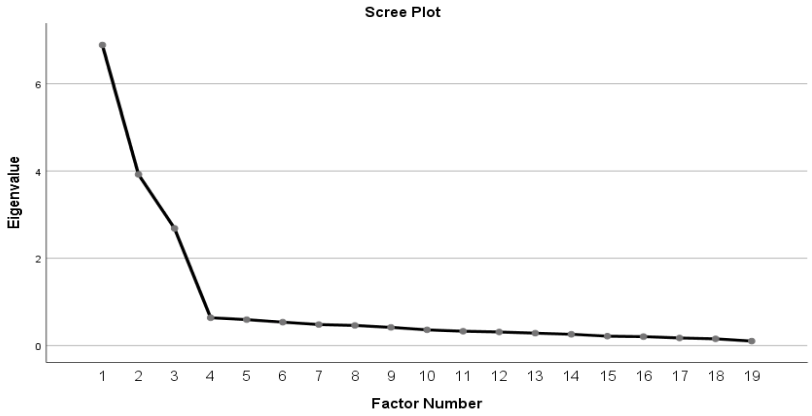
Correlation Matrix of the Social Intelligence Scale After Poor Items Discarded

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SIP1	-																		
2. SIP2	.70**	-																	
3. SIP3	.80**	.71**	-																
4. SIP4	.69**	.67**	.72**	-															
5. SIP5	.73**	.66**	.75**	.80**	-														
6. SIP6	.65**	.66**	.63**	.74**	.76**	-													
7. SIP7	.62**	.61**	.67**	.67**	.74**	.81**	-												
8. SS1	.17*	.07	.21**	.19*	.21**	.14	.25**	-											
9. SS2	.19*	.08	.22**	.21**	.19*	.15	.22**	.70**	-										
10. SS3	.30**	.22**	.30**	.27**	.31**	.25**	.28**	.63**	.65**	-									
11. SS5	.19*	.06	.19*	.24**	.20*	.14	.13	.57**	.54**	.63**	-								
12. SS6	.31**	.18*	.32**	.36**	.33**	.23**	.29**	.55**	.70**	.65**	.68**	-							
13. SS7	.26**	.10	.29**	.24**	.26**	.20*	.21**	.60**	.55**	.55**	.66**	.72**	-						
14. SA1	.16*	.04	.17*	.16*	.19*	.13	.22**	.22**	.15	.20*	.22**	.24**	.25**	-					
15. SA2	.14	.12	.20*	.15*	.17*	.16*	.17*	.27**	.20**	.30**	.32**	.27**	.25**	.65**	-				
16. SA3	.10	.07	.20**	.10	.14	.15	.14	.28**	.17*	.32**	.32**	.28**	.30**	.59**	.66**	-			
17. SA4	.04	.01	.09	.04	.08	.06	.08	.12	.07	.13	.10	.10	.12	.56**	.55**	.58**	-		
18. SA5	.01	-.03	.04	.04	.06	.04	.12	.30**	.09	.20**	.29**	.17*	.26**	.59**	.62**	.63**	.53**	-	
19. SA6	.13	.08	.13	.10	.13	.13	.16*	.25**	.14	.25**	.24**	.21**	.22**	.57**	.77**	.59**	.61**	.61**	-

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed); SIP = social information processing; SSs = social skills; SA = social awareness.

Figure 1

Scree plot Depicting Factors of the Social Intelligence Measure based on Eigenvalues



In the first step of the exploratory factor analysis, two items in the social skills and social awareness subscales (SS4 & SA7) were found to be poorly loading items. They did not show acceptable values, revealing the items were not good enough to fit with the rest items in their respective factors. They yielded the lowest commonality values: *SS4* (.190) and *SA7* (.055). We removed these items, and thus, the total variance explained increased from 62.515% to 65.531%. Significant differences in the factor loading values of the other items were also shown (see Table 4).

After discarding those poorly functioning items, the result of the exploratory factor analysis showed considerable change and progress with strong loadings of items. The result revealed the presence of three factors on the social intelligence scale with eigenvalues exceeding 1. The three-factor solution explained a total of 65.531% of the variance, comprising 34.062%, 19.254%, and 12.215% of the variances respectively. The rotated solution showed that all individual items of the measure significantly loaded on all factors. That is, the SIP items were strongly loaded on

factor 1, the SSs items were strongly loaded on factor 2 and the SA items were strongly loaded on factor 3. The rotation result yielded that there were no poorly loaded items in each factor. There were no cross-loadings either (see Table 4).

Table 4

Factor Loadings of the Rotated Three-factor Measure for the Social Intelligence Scale

	Factor			Commonalities
	1	***2***	***3***	
I can often understand what others are trying to accomplish without the need for them to say anything	.890			.794
I understand others' wishes	.858			.739
I understand other people's feelings	.847			.721
I can predict how others will react to my behavior	.843			.714
I can predict other people's behavior	.828			.687
I can often understand what others mean through their expressions, body language, etc	.817			.671
I know how my actions will make others feel	.789			.637
I have no difficulties to fit in easily in social situations mostly		.852		.732
I know how to exhibit respect for others in different social situations		.792		.641
I am good at entering new situations and meeting people for the first time		.782		.617
I have no problems getting along with other people mostly		.782		.612
It doesn't take me a very long time to get to know others well mostly		.779		.614
I am good at getting on good terms with new people		.755		.563
People are mostly comfortable with me when I say what I think			.861	.745
I realize it when I offend others or make them feel bad			.827	.684
I am always mindful of my actions thinking seriously about others' reactions towards what I do			.779	.613
I am not very surprised with the things people from a different or similar background			.760	.585
I often feel that it is not very difficult to understand others' choices			.748	.563
I can identify predictable and unpredictable people and treat them and/or act accordingly			.704	.509

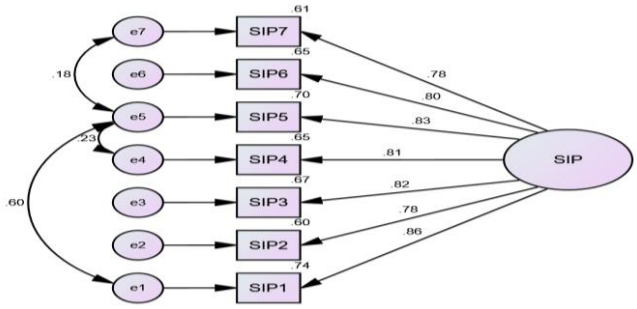
Confirmatory Factor Analysis Result

To examine the relationship between observed factors and latent variables, we conducted a confirmatory factor analysis next to the exploratory factor analysis. As pointed out before, the data set was first split into two. Consequently, the confirmatory factor analysis was conducted on the second cluster of the data set that comprised 173 sample participants. By using a unidimensional CFA test first, observed items (indicators) for each variable with its metric value were identified.

To determine whether the adapted measurement model could fit the present data or not, we used the combination of the various fit indices types such as the relative chi-square test (x^2/df), Incremental Fit Index (IFI), the Tucker-Lewis Index (TLI), the Bentler-Bonett Normed Fit Index (NFI), the Bentler's Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). In this regard, Hu and Bentler (1999), for example, suggested that it is important to use the combination of one of the different types of fit indices such as absolute fit indices, relative (or comparative) fit indices, parsimony fit indices, and those based on the noncentrality-based parameter to minimize Type I and Type II errors under various conditions.

Figure 2

First-Order Measurement Model for Social Information Processing



The social information processing (SIP) variable constituted seven items. Based on the modification indices recommendations, the covariance of error terms was required. Accordingly, the correlation of error terms between item 1 and item 5 (e1 & e5), items 4 and 5 (e4 & e5), and items 5 and 7 (e5 & e7) was done (see Figure 2). Subsequently, the model yielded a relative chi-square test (x^2/df = 1.729), IFI = .992, TLI = .984, NFI = .981, CFI = .992, RMSEA = .065 (PCLOSE = .271), SRMR = .021. The standard regression weight ranged from .781 (SIP7) to .858 (SIP1).

Figure 3

First-Order Measurement Model for Social Skills

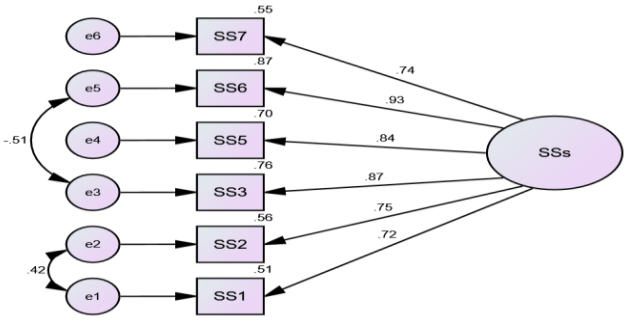
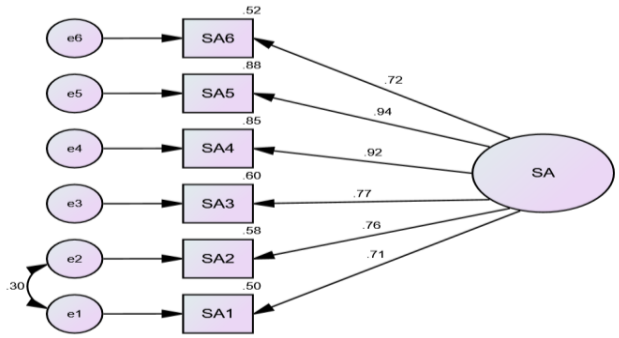


Figure 3 presents the social skills (SSs) measurement model that comprises six items. To improve the model, a correlation of error terms for this measurement model was needed. After a correlation of error terms between item 1 and item 2 (e1 & e2) and item 3 and 6 (e3 & e5), it was found that that a relative chi-square test (x^2/df = 1.237), IFI = .998, TLI = .995, NFI = .988, CFI = .998, RMSEA = .037 (PCLOSE = .544), SRMR = .019. The standard regression weight ranged from .717 (SS1) to .931(SS6).

Figure 4

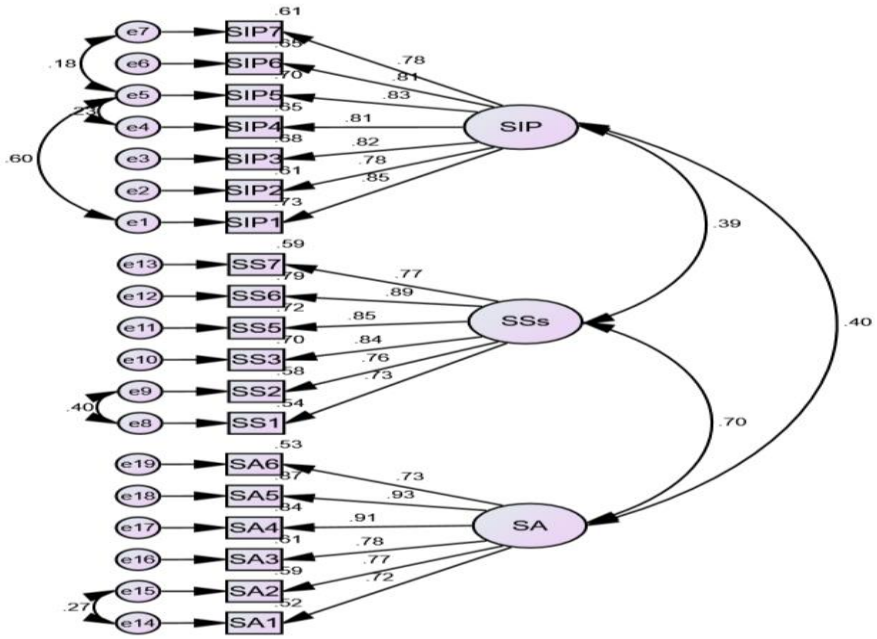
First-Order Measurement Model for Social Awareness



The first-order measurement model for social awareness (SA) had six items. For a better model fit, a correlation of error terms between item 1 and item 2 (e1 & e2) based on the modification indices suggested by AMOS 23 was conducted. Consequently, it was found out a relative chi-square test (x^2/df = 1.458), IFI = .995, TLI = .991, NFI = .985, CFI = .995, RMSEA = .052 (PCLOSE = .424), SRMR = .036. The standard regression weight was found to range from .709 (SA1) to .938 (SA5).

Figure 5

First-Order Three-factor Social Intelligence Measurement Model



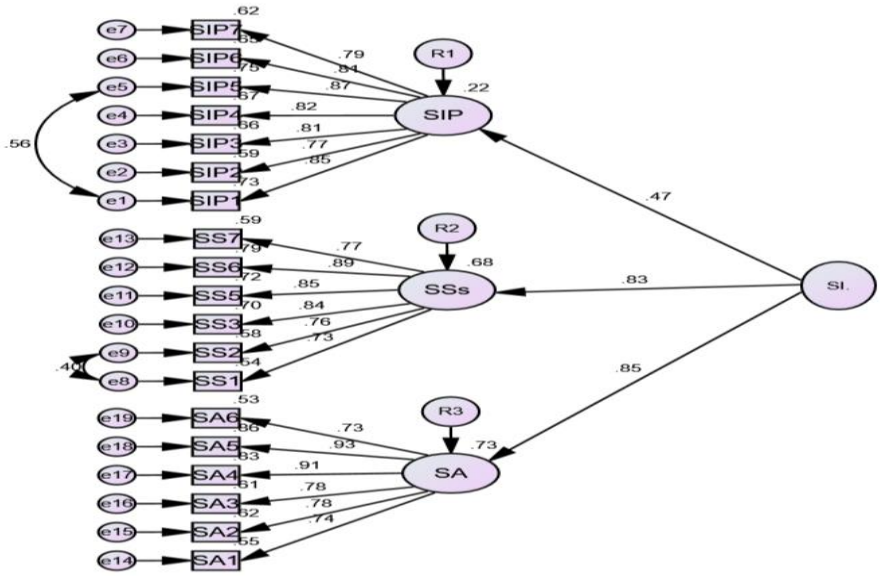
The result of the confirmatory factor analysis of the first-order three-factor model for the social intelligence scale was the same as the first-order results of the factors (see Figure 5). It yielded values that indicated an excellent model fit; a relative chi-square test (x^2/df = 1.430), IFI = .977, TLI = .972, NFI = .926, CFI = .976, RMSEA = .050 (PCLOSE = .486), SRMR = .054. Figure 5 presents some of the details of the result of the CFA such as the standardized regression weights, correlation of the latent factors, the squared multiple correlation coefficients, and the covariance of error terms of the final measurement model.

The final structural measurement model for social intelligence was found with (x^2/df = 1.576), IFI = .968, TLI = .962, NFI = .917, CFI = .968, RMSEA = .058

(PCLOSE = .178), SRMR = .053. The error covariances in the first- and second-order model examinations were not observed (see Figure 6).

Figure 6

Second-Order Structural Measurement Model for Social Intelligence



Construct Reliability and Validity

Because a construct's reliability and validity can be calculated and determined by referencing some of the values in the confirmatory factor analysis result, we calculated and used the Composite Reliability (CR) and the Average Variance Extracted (AVE) for the purposes. Besides the internal consistency reliability measured by Cronbach's alpha, we conducted a composite reliability (CR) analysis to examine the reliability of the scale. Consequently, the CR of SIP, SA, and SSs were found .93, .92, and .92 respectively. Composite reliability is a vital technique to assess

the reliability of factor measurement, applying the same criteria of cutoffs for adequate reliability coefficients.

We examined convergent validity to assess the degree to which all items of the social intelligence measure measured the same underlying construct they were supposed to measure. The Average Variance Extracted (AVE) is one of the criteria to know the convergent validity of a construct. The AVE of the SIP, SA, and SSs constructs were found .67, .66, and .65 respectively, which showed convergent validity and exhibited the occurrence of correlation between observed factors within each latent variable. The average extracted standards should be greater than .50 to show the presence of convergent validity (Hair et al., 2019).

To examine and know the extent to which the variables correlated to their factor than to another factor, we examined the discriminant validity of the measure. Among the various methods used to assess discriminant validity, AVE is one of those methods widely used to examine. The square root of the values of the AVE of the latent variables (SIP, SA & SSs) were .82, .81, and .80 respectively, which, in turn, is greater than the correlation between them (i.e., .40, .39 & .70), confirming the discriminant validity of the measurement model. Table 5 depicts details of the reliability and validity of the measure.

Table 5

Reliability and Validity of the Social Intelligence Scale

	Construct		
	SIP	*SA*	*SSs*
Cronbach's alpha	.94	.91	.92
CR	.93	.92	.92
AVE	.67	.66	.65
Number of Items	7	6	6

CR = composite reliability; AVE = average variance explained; SIP = social information processing; SA = social awareness; SSs = social skills.

Discussion

The study used the TSIS, which has become one of the most frequently used instruments in several recent social intelligence studies, by adapting to the Ethiopian context and translating it into the Amharic language version. Out of the 21 items the original scale constituted, the 19 items were found relevant and appropriate (culture universal) to measure the social intelligence construct in the Ethiopian context of the Amharic language-speaking students. The two items that were limited to the original measurement model but that lacked practical relevance or similarity in psychological meaning to the context of the present study were deleted.

The majority of correlation coefficients of retained items in their respective factor were found to be greater than .5, which is large. In this regard, different authors suggest different interpretations. Cohen (1988, p. 79-81), for example, suggested small (r =.10 to .29), medium (r =.30 to .49), and large (r =.50 to 1.0).

We employed an exploratory factor analysis (EFA) by applying the maximum likelihood extraction method with Promax rotation. The result of the EFA showed that social intelligence is a three-factor construct, comprising social information processing, social skill, and social awareness dimensions. This result is consistent with prior studies on the measure (e.g., Chater et al., 2023; Dorgan & Cetin, 2009; Frankovsky & Birkner, 2014). The multidimensional nature of the social intelligence construct had more empirical support from studies that used self-report methods of social intelligence (e.g., Brown & Anthony, 1990; Kriemeen & Hajaia, 2017; Marlowe, 1986), revealing similar results. Therefore, the factor structure of the Amharic language version of TSIS was checked and found invariant in a new setting in the present study.

Following the EFA, we conducted a confirmatory factor analysis (CFA) to examine the model fit of the data by employing the maximum likelihood estimation method and the combination of the different types of fit indices to determine model fit. An overlap between a few items was found. A correlation of error terms between these items in their respective factors was conducted based on the modification indices suggested by AMOS 23 software to obtain a good model fit.

Consequently, the loadings of the standardized regression weight for the 19 items ranged from .724 (social awareness item 1) to .933 (social awareness item 5). All the correlations among the latent and observed variables were significant ($p < .05$) and all the loadings were greater than .7. Using the rules of thumb (Tabachnick & Fidell, 2007), all the factor loadings were considered fair to excellent, and all indicator variables significantly loaded on the expected latent variable. The variance explained by the observed variables (R^2) ranged from .525 (social awareness item 1) to .870 (social awareness item 5). In other words, the explained variance ranged from 52.5% to 87% while the unexplained variance or residual was from 47.5% to 13% respectively. Items that explained the lowest and highest variances were found in the social awareness factor. It is important to note here that the items in the social information processing and social skill factors explained variances under this range. This means the relevance and appropriateness of the 19 items to the Ethiopian context was confirmed. Similarly, in a study conducted by Kyoung et al. (2019) to validate the TSIS to the Korean Version, for example, four items were not found appropriate to their context. Measuring psychological constructs across different populations requires that the instrument's reliably and validly capture the construct of interest within each separate population (Fischer, & Smith, 2021).

In terms of factor-wise contribution, the standardized regression weight for the three-factor structure of social information processing, social skills, and social awareness was found .473, .826, and .852 respectively. The variance explained by the observed variables (R^2) for social information processing, social skills, and social awareness was found .224 (22.4%), .683 (68.3%), and .726 (72.6%) respectively in the model. This is in an acceptable range for social science. An R-squared that is between 0.10 and 0.50 is acceptable provided that some or most of the explanatory variables are statistically significant, and between 0.50 and 0.99 is acceptable when most of the explanatory variables are statistically significant in social science. The only caution to the latter is that the high R squared should not be caused by multicollinearity among the explanatory variables (Ozili, 2023).

The correlation between the latent factors was found r = .39 (between social information processing & social skill), r = .40 (between social information processing and social awareness), and r = .70 (between social skills and social awareness). All the correlations among the latent factors were statistically significant (p < .05). This implies that the strength of the relationships of the TSIS factors of the Amharic language version was found good enough.

To sum up, the study finally revealed that all items of the Amharic language version of the TSIS were found measuring the same underlying construct they were supposed to measure, indicating convergent validity, and the items correlated to their factor than to another factor, showing discriminant validity of the measure. This was consistent with previous studies (e.g., Chater et al., 2023) and the original version of TSIS (Silvera et al., 2001). However, the result of the study was found inconsistent with the established hypothesis regarding the importance of all 21 items of the TSIS. A social skill item, which read as "*I often feel uncertain if what I am doing is right*

around new people" and a social awareness item, which read as "*Other people become angry with me without explaining to me why*" were not found relevant and appropriate to measure the social intelligence construct in the Ethiopian context of the Amharic-speaking public university students.

Conclusion

One of the challenges raised in measuring the social intelligence construct was its abstraction to easily transform into measurable performances or explicit behaviors. Consequently, Silvera et al. (2001) contributed to the TSIS by tackling adequately this measurement issue.

Ethiopia is a country with a diversified population in terms of ethnicity, culture, and religion. The interplay of human-to-human is considered to be essential for existence by the larger community. University students' societal and cultural values, in this regard, cannot be seen as different from the general society. Thus, the plan to adapt and validate the TSIS measure in senior undergraduate students of two public universities would be important bedrock for the investigation of the construct and its relationship with other variables in the future.

It is possible to conclude that the measure would be instrumental material in the elucidation of social cognitive studies for further investigations in the area, and for those researchers who are keen to know about students' ability to get along with others and their ability to understand complex social relationships (i.e., social intelligence). This theoretical contribution will not be negligible because there is still a perception regarding intelligence as a mere cognitive ability, even by a significant number of the academic community.

The measure will have empirical and practical contributions in the area because understanding and knowledge of the level of students' social intelligence

gives important resources to design and develop intervention strategies for the advancement and proper utilization of the attributes. For example, it is possible to mitigate conflicts in universities resulting from a lack of capability of respecting and/or tolerating differences among students from the same and/or different backgrounds. For example, as previous studies indicated (as discussed in the Literature review section), it is possible to increase students' academic effectiveness by maximizing their social intelligence. By understanding the behavioral patterns and trajectories related to social intelligence, and using a reliable and valid measure, it will be then possible to design interventional strategies and/or approaches.

Therefore, from the overall result, it can be concluded that our plan to adapt and validate the TSIS, instead of directly using it because it is a standardized instrument, as appropriate. Apart from the significance that we mentioned above, psychological measures need to be contextualized and validated so that a reliable and valid measure can be obtained. The study in general has shown that the Tromso Social Intelligence Scale (TSIS) in the Amharic version was a reliable and valid measure.

Limitations and Future Recommendations

Despite the contributions the study would have to the theoretical, practical, and empirical developments, we have acknowledged its limitations as well. That is, the confirmatory factor analysis was done on a sample of 173 participants. The limited sample size in the present study arises from methodological reasons. Though this is acceptable in the literature, some authors suggest conducting confirmatory factor analysis on more than 200 cases for better precision and replicability. This can be taken as a limitation of the study.

We, therefore, (a) recommend future researchers test the hypothesized measurement model on a sample size greater than the present study. (b) In the present

study, two items were found unit of the present study context. Future researchers in the area need to compromise on using imported social intelligence measures and recheck the functionality universality before employing them in perceived standardized quality. (c) The study examined and tested the TSIS, which is imported from other cultures. The instrument can help investigate and understand social intelligence attributes that are culture-universal. As an imported material, it may fall short of identifying social intelligence measures that are unique to the present study. Therefore, we recommend future researchers explore these attributes and unique characteristics of the Ethiopian culture through qualitative research. (d) The study confirmed the functional universality of the TSIS factors by examining their relationship with each other. This is one approach to the validity of a measure. We recommend other researchers to investigate the functional universality of the TSIS factors by examining the consequences of social intelligence (other outcome variables).

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Enhancing the Provision of Integrated Functional Adult Education Program through Community Engagement: The Case of Mettu University in Oromia National Regional State

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Abstract

The aim of the study was to investigate the contribution of Mettu University in enhancing the provision of Integrated Functional Adult Education through community engagement in Ilubabor Zone of Oromia national regional state. The study employed descriptive design and mixed method. Data was collected from 134 respondents selected from IFAE program center facilitators, coordinators, zone and district education offices, and Mettu University staff. Simple random and purposive sampling techniques were used in this study. Questionnaire, semi-structured interviews, and focus group discussion were used to collect both quantitative and qualitative data. The quantitative information was analyzed by using frequency count and percentage, and the qualitative information were expressed through descriptive statements, interpreted and supplemented with the quantitative data. The major findings of the study were: Mettu University limited itself to the training given inside the university; the academic staff of AECD department of Mettu University engaged with the IFAE program in Ilubabor Zone only via student practicum and not through academic staff engagement; there is lack of organized communication channel of zone and district education offices within Mettu University with regards to community engagement. It can be concluded that the contribution of Mettu University to enhance the provision of IFAE program is low, and it is limited to the academic setting. It is therefore suggested that the academic and non-academic staff of the University should recognize the potential and contributions of instructors; the University should integrate issues of IFAE in its community engagement practices; it should also create an opportunity in which both its university teachers and students can provide service learning in the area of IFAE to enhance the provision of IFAE through community engagement.

Keywords: University-community engagement, community engagement, Integrated Functional Adult Education.

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Introduction

Background of the Study

In recent years, university–community engagement has been implemented by an increasing number of universities across the world. Activities such as service-based learning and participatory research are receiving more and more attention from various stakeholders such as policymakers, academics, and authorities (Grau *et al*., 2017). Coincidentally, these changes are taking place during a time when universities are expected to have a global impact through their research.

In a knowledge-driven economy, universities play a vital role in creating new knowledge – either independently or in collaboration with external actors. This knowledge is then transferred or integrated into society as a whole, and into the public and private sectors. Firms' interaction with universities may grant access to specialized knowledge and the opportunity to conduct high-quality research (Hussler *et al*., 2010; Laursen & Salter, 2004; Raesfeld *et al*., 2012), thereby creating new possibilities for innovation development (Mansfield, 1991; Cohen *et al*., 2002; Dahlander & Gann, 2010).

Since its establishment besides teaching and learning, Mettu University has been engaged in various community service activities. The community services aimed at enabling the local community to cope with daily life problems by creating development opportunities to make the community beneficiary from the university's resources. Mettu University has also embarked many study programs so as to expand education opportunities to the society, and the Department of Adult Education and Community Development (AECD) is among the academic units in this university.

Mettu University has been involved in the training of adult educators through well-designed curricula on degree programs. In addition, Mettu University places undergraduate students to the nearby local districts and get them investigate tasks accomplished through the Integrated Functional Adult Education (IFAE) program.

Adult learning takes place in a number of settings such as colleges, universities, vocational training, business and industry, professional education, community action, literacy education, or informal learning networks. Adults learn best in a collaborative setting in which they are taking and giving knowledge and wisdom. Hence, facilitating adult learning is the result of collaborations, networks and interactive learning across diverse types of actors.

Universities are expected to be "good neighbors," and university–community engagement is presumably a way to meet these expectations (Benneworth *et al*., 2008). By engaging locally, it is argued that universities could ensure their relevance to society, strengthen public trust, and partially justify the public resources they receive (Benneworth *et al*., 2008; Hart & Northmore, 2011). Academics should reinvent themselves, get out of the perceived "ivory tower," and engage with local communities. Supposedly, this would lead to the enhancement of the goals of universities while also increasing local actors' capacity to address and resolve the issues they confront.

Mettu University recognizes community service as a key area of activity so as to share a high level of expertise with the community. Engagement with society and communities flows from the University's teaching and research functions and translate the policy in ways that are consistent with the institution's vision and mission, linking

the best of the research and teaching skills of the staff and students to the specific needs of the local community.

Mettu University has been working on the following Identified Community Service Thematic Areas: Health Sciences, Agricultural Sciences, Natural Sciences, Engineering and Technology, Social Sciences, Business and Economics, Law, and Education and Behavioral Sciences. Mettu University's community engagement/service directorate indicates that multiple issues are categorized under these thematic areas, and adult education and community development is one of the areas considered as one part of its community engagement practices.

Unless this diversity of capabilities and resources are not successfully organized, change in the livelihood of adults cannot be happen. It is this capitalization of knowledge that is the heart of a new mission for the university, linking universities to users of knowledge more tightly and establishing the university as an economic actor in its own right. To this end, the researchers investigated the contribution of Mettu University in enhancing the provision of Integrated Functional Adult Education program through community engagement.

Mettu University has been engaged in serving the community in various service providing activities. In fact, Mettu University community engagement is providing many short-term training for employees who are working in different government sectors aiming at filling skill and knowledge gaps related to the employee's daily duties. Besides providing such training, Mettu University has contributed financial and

material resources that directly serve the community for health institutions, agriculture, secondary schools, including community's cultural issues.

Developing human capacity in general and the productive adult population in urban and rural Ethiopia in particular are necessary both to further strengthen these efforts and realize the international and national development goals. Hence, it is essential to provide an integrated functional adult education (IFAE) program that is not only closely related to daily life, health, income generation, productivity, etc., but also improves these and other aspects of life (MoE, 2011: 3).

A study conducted by Kitessa and Tekalign (2017) in Ilubabor Zone showed that there was poor management and organization of integrated functional adult literacy program with regards to planning, monitoring, evaluating and getting feedback of the outcome of the program. Besides, there were lack of motivation and willingness of adults/learners to participate in the program. Additionally, many of the facilitators did not receive the initial training which could equip them with the necessary skills and knowledge of teaching for instructional planning and classroom management. However, there has been no improvement.

Regarding IFAE program provision and implementation, a study by Andualem and Wubayew (2017) revealed that the program was ineffective, and the achievement standards of the trainers were insufficient from one level to the other. Organization of the program was not integrated to ensure a relationship among the concerned offices to ensure the achievement of the program in between sectors. The program in practice was comprehensive.

On the other side, from the researchers' observation of Adult Education Program in the sampled districts of Ilubabor Zone, the performance of the facilitators and the coordinators of the program was weak; they assumed as if it was additional work given to them. Consequently, the overall program seems to be forgotten or it might be terminated at some level.

To the knowledge of the researchers no study has been conducted to explore the reasons behind lack of effectiveness of IFAE program in the study area. The researchers think this study will help to fill the existing gap by searching other possible opportunities like working collaboratively with higher educational institutions. Since Mettu University has been involved in training of adult educators for the past nine years and has professionals with accumulated experiences in this field of specialization, it will be possible to link this knowledge with that of the university's community engagement practices. Looking at the great motto of Mettu University which says "We are dedicated to serve the Community", the researchers aimed to investigate the contribution of Mettu University in enhancing the provision of Integrated Functional Adult Education (IFAE) program through community engagement.

Methods

Description of the Study Area

Illubabor is a zone in Oromia Region of Ethiopia. It is bordered on the south by the Southern Nations, Nationalities and Peoples Region, on the southwest by the Gambela Region, on the west by Kelem Welega Zone, on the north by West Welega Zone, on the northwest by East Welega Zone, and on the east by Buno Bedele Zone.

Illubabor Zone is about 600 kilometers far from the capital Addis Ababa. According to the government structure, the Illubabor Zone is sub-divided into 14 Districts. Yayo, Hurumu, Alle/Gore, Ukka, and Bure districts are the focus areas of this study among the 14 districts. Mettu University which was taken as the other focus area of this study is also found in Illubabor Zone. It was established among the third generation universities with the primary mission to ensure quality education, undertake problem-solving research, and carry out multi-dimensional services to the communities. Adult Education and Community Development is one of the departments found in this university.

Research Design

The study employed a descriptive design. The researchers preferred descriptive design for two main reasons. The first is using descriptive design helps to describe the present status of existence or absence of what is being investigated (Osuji, 2012). Second, descriptive design allows the combined use of a great variety of instruments in the data collection, saving time and energy as well as money that the researchers spend over data collection (Osuji, 2012: 76).

Research Approach

In this study, mixed method was used to generate and examine information obtained from respondents. Because it provides a more complete picture by noting trends and generalizations as well as in-depth knowledge of participants' perspectives (Creswell *et al*., 2002). The quantitative method would help the researchers to examine the quantitative data obtained through questionnaire with close-ended question items and the qualitative method would also help to examine the data obtained through the

use of open-ended questionnaire, focus group discussion (FGD), document analysis, and interview.

Target Population, Sample Size and Sampling Technique

The target population of this study was IFAE Program Center Facilitators (161), IFAE Program Coordinators at district level (20), IFAE Program Coordinators at Zonal level (7), Mettu University AECD department head and instructors (9), and Mettu University top level administrative (5), the total number was 202.

Here the researchers preferred to use a simplified formula to determine or calculate sample sizes by referring to Yamane (1967, p. 886), which is presented as

$$n = \frac{N}{1+N\,(e)^2}$$

Where n = sample size

N = population size

e = error (0.05) reliability level 95% or; *e* = level of precision always set the value of 0.05

- For selecting total sample size: $n = \frac{N}{1+N(e)^2} = \frac{202}{1+202(0.05)^2} = \frac{202}{1.505} = 134$

- For each categories of Respondents: for example

To determine samples from facilitators**:** $n = \frac{RPS}{N}(n) = \frac{161}{202}(134) = 107$

To this end, the researchers drew the representative sample through simple random and purposive sampling techniques from the target study population. "Purposive sampling helps to ensure selecting the sample who are pre-determined in number and are best positioned to provide the needed information for the study" (Kumar, 2011, p. 167). To this end, by using random sampling 13 AEP coordinators, Mettu University president and 2 academic vise-presidents as well as AECD department head, and 5 AECD department teachers were selected. Additionally, simple random sampling technique was also employed for selecting IFAE center facilitators from the five districts (Yayo, Gore, Hurumu, Ukka, and Bure). As a result, out of 161 IFAE center facilitators listed, 107 samples were selected randomly. Five IFAE program coordinators from Ilubabor Zone Education Office were also chosen because of their experience in the area of IFAE program, and totally 134 respondents were involved in this study.

Type and Sources of Data

The data for this study was collected from both primary and secondary sources. The primary source was the University's administration body, AECD department head and teachers, IFAE facilitators and coordinators at zonal and district levels; these were directly involved in the program. Secondary data source were the document or the

record which is available in Mettu University/AECD department and in AEP coordinators both at zonal and district levels.

Data Collection Tools

The researchers carefully collected the relevant IFAE information from the sample through three data gathering tools. These are: Questionnaire (composed of close-ended and open-ended items), Interview, Focus Group Discussion, and Observation.

Interview

Semi-structured interview was used to gather data from the University's president, vise-presidents and AECD department head and University instructors, as well as each district AEP coordinators. Accordingly, a one-hour interview was conducted with each respondent; and the questions were about the university's community engagement activities, university-community linkage, contribution of the university in enhancing IFAE program in terms of resources, and the challenges hindering the university in enhancing the provision of IFAE program through the community engagement activities.

Questionnaire

By and large, questionnaire is the most preferable among instruments for data collection when studying large population. For this reason, the researchers prepared 31 items questionnaire composed of 25 close-ended and 6 open-ended items to collect information from IFAE Program center facilitators. The questions were about the

competency level of the facilitators, the administration of IFAE program, the support MU is providing to IFAE program enhancement and the effectiveness of the university's community engagement from IFAE program perspective.

Focus Group Discussion

Focus Group Discussions were conducted to verify, build on and add depth to the result of Key Informant Interviews. One focus group discussion with one group with 6 participants was conducted with the coordinators of IFAE program at zonal education office. The participants of the discussion were 4 male and 2 females, and the discussion was conducted for 60 minutes in the compound of the zone education office. The questions were about the status of IFAE program in Ilubabor Zone, the required competency level of IFAE program facilitators, relations Mettu University has with zone and district education offices, areas of Mettu University community engagement, the contribution of Mettu University in supporting the provision of IFAE, and effectiveness of Mettu University's intervention from IFAE program perspective. The discussion was facilitated and guided by the researchers.

Observation

Observation was conducted to verify, build on and substantiate the results obtained through the other data collection instruments. The researchers conducted observations on the sampled districts using an observation checklist.

Method of Data Analysis

Views from the sample participants in the interview, open-ended questionnaire, and FGD with further literature and research on the issue studied were coded and given value and finally analyzed through qualitative narration. This was done by identifying the words of the respondent and by reviewing the documents carefully. The quantitative data collected through closed ended questionnaire was analyzed using frequency tables and percentages.

Validity and Reliability Analysis

Validity

The data collection tools developed by the researchers were used in this study. In order to ensure the validity of the research instruments, the researchers gave the draft research tools to senior colleagues in the field to evaluate appropriateness of the items and to ensure that all the questions asked in the tools fully reflect the research objectives and the research questions. In addition, a pilot test was conducted on Mettu District which was not included in the sample; feedback from the pilot survey was also used to check the appropriateness of the questions.

Reliability

After designing the data collection tools, a reliability analysis was done to ensure measurements are reliable for the study. The reliability of the questionnaire was tested using a reliability test with the help of Statistical Package for Social Science (SPSS) software. That is, the Cronbach‘s alpha for organizing stage, performance stage, and evaluation stage were measured to identify the internal consistency of the survey is found to be good. Literature indicates that reliability or internal consistency reflects the

extent to which items within an instrument measure various aspects of the same characteristic or construct. That is, Cronbach‘s alpha indicates the degree to which the items in the scale correlate with each other in the group; for an instrument to be reliable, the Cronbach‘s alpha value should be above 0.7. Various authors suggest that, if the range of Cronbach‘s alpha value is above 0.9, the internal consistency is considered to be excellent; if it is 0.8-0.9, the internal consistency is good; if it is 0.7-0.8, the internal consistency is acceptable; and if the range is below 0.7, the internal consistency is considered to be questionable or poor or unacceptable. Accordingly, the calculated values of Cronbach‘s alpha values for the variables of the study were above 0.7. That is, 0.965 for organizing state, 0.889 for performance stage, and 0.869 for evaluation stage. Hence, the Cronbach‘s alpha values of all the variables of the study were above 0.8, indicating the internal consistency is in the range of excellent and good. The calculated Cronbach‘s alpha values of the variables are presented in Table 1.

Table 1

Cronbach’s Alpha Value

Reliability Statistics		
Variable	Cronbach’s Alpha	N of items
Organizing stage	0.965	5
Performance stage	0.889	5
Evaluation stage	0.869	4

Results and Discussions

Background Characteristics of Respondents

The data collected on the characteristics of the facilitators indicate that, the majority of facilitators, that is, 104 (97%), were found to be between the age of 15 to 34 and 3 (2.8%), were between the age of 35 to 50 years. This shows that the participants are young enough who can contribute to the development.

The educational background of the majority of respondents (facilitators), 92 (86%), were grade 10/12 completed; those facilitators who had qualifications above secondary education were 15 (14%). This shows that the qualification of the facilitators was up to the standard and it is a good opportunity to implement the program. The facilitators recruited for IFAE program must have completed at least grade ten, be familiar with language, culture and living of the community, be acceptable by the community; female candidates are given priorities (MoE, 2011b).

The data collected on the employment background of the IFAE facilitators indicate that 79 (73.8%) of the respondent facilitators are permanently hired, the remaining 20 (18.7%), and 8 (7.5%) are temporary workers and volunteers (free servants), respectively.

This shows that most of them were permanently employed. However, the employment status of both temporary and free servant facilitators might have negative attribution on the implementation of the program because they may not give due concern for the profession rather concentrate on searching other work that may invite them to be permanently employed.

Mandate of Mettu University's AECD department in supporting the provision of Integrated Functional Adult Education program

As one of the departments in Mettu University, AECD department has been engaged more on teaching-learning and research, but not actively participating in community activities as a department. The university's system couldn't give them an opportunity to engage in such activities rather it gives an opportunity to other departments to participate on community engagement activities.

Regarding the mandate of AECD department, the respondent stated:

> *As a department we do have a regular program to produce skilled man power who can shoulder society's burden, to conduct problem solving research and projects and to provide community services. In this essence, we have been giving different training courses for adult education program coordinators working at woreda level in first degree program. However, it was not so much effective because it only focused on the training of education office experts and even limited inside the university campus.*

This indicated that Mettu University's AECD department has done good to support the provision of IFAE, but it limited itself to the training given inside the university and could not consider providing technical support including provision of training for the program facilitators and adult learners outside the university.

As the participant replied,

> *This is similar with the above issue. What I can say surely is without having communication or interaction with the community outside the academia, how can we transfer knowledge? To do this, first there should be a way to create community linkage in order to share our expertise knowledge in the area of IFAE.*

This shows that the attention given to department-community linkage is very low although this might lead to the question who the responsible body, apart from the department leader, is.

There is an opportunity that allows both teachers and students of this department to interact with the external community. However, the purpose of this interaction is for the sake of practicum work which helps the students to get insight on the theory they have learnt in the classroom with its application on the ground. This is done through observation of IFAE adult learning centers around the local districts.

This indicates that the department's interaction is somewhat good when seen from the students' perspective. This shows that the contribution of Mettu University's AECD department teachers is very low as they were not directly involved in the process. That is, the academic staff of AECD department of Mettu University engaged with the IFAE program in the zone only via student practicum, not through academic staff engagement.

There is no formal relationship with the education offices at zonal and/or district level. They communicate sometimes when the department needs some information for

its own purpose. This revealed that lack of horizontal or vertical relationship with the education offices at zonal and/or district level hindered the knowledge exchange between Mettu University's AECD department instructors and local community with regard to IFAE program. So lack of such relationship might be one factor for the weak department-community linkage.

Mettu University's AECD department assessed the gaps faced by AEF & Coordinators in implementing the program in Ilubabor Zone local districts in two ways: indirectly from the department students' interaction with the local community through practicum works, and directly from the research done by department teachers. In this essence, poor awareness on the program, lack of cooperation and coordination among the stakeholders, low competency level (knowledge, skill, and attitude) of IFAE facilitators, and lack of knowledge of coordinators on planning, organizing, evaluating as well as monitoring the program are the main gaps identified in implementing the program.

Mettu University's AECD department has contributed to the area of IFAE through the training of coordinators through its program. This showed that to some extent it might minimize lack of skilled human power in the area. However, regarding the contribution in terms of knowledge sharing, learning material resources, and allocating budget, there is no such support provided by this department for the improvement of IFAE.

Mettu University's Role in Supporting IFAE Program

All the respondent samples of Mettu University' administration had served 6-10 years in Mettu University. On the other hand, they have 3-5 years of experience at their current work position hence they might have more information in the area of Mettu University' community engagement practices.

The respondents sampled from Mettu University' administration indicated that, Mettu University's mission holds three main categories: Teaching and Learning, research, and community engagement/service. The overall mission of Mettu University is stated as:

> *Offering quality education to produce competent graduate, conducting need-based researches that alleviate societal problems and offering need based multidimensional services to the community.*

According to the available literature on this issue, the basic function of this third dimension of any mission refers to the knowledge transfer from the academic environment to the whole society, and it covers everything besides traditional teaching and research (Jongbloed, Enders & Salerno, 2008).

Other studies have shown that policies and related administrative directives are believed to be pressures that are important drivers of institutionalization (Sanchez-Barrioluengo, 2014; Pinheiro, Langa & Pausits, 2011).

As the data revealed, translating the University's mission, vision and goal is the prior mandate of each department. Of course, Mettu University offers each department

to be engaged in community activities, but the academic staff members of Mettu University did not fully engage in community activities. The literature on this issue state that "As in any other professions, working conditions, the overall environment under which academic staff perform their daily tasks, determines not only their motivation to work but also their sense of belongingness, attachment to their institution, and even their self-esteem" (Ayenachew, 2013).

On the issue of university-community linkage and knowledge transfer, all the respondents stated that Mettu University has been working in this area by establishing different mechanisms, creating awareness through the University's community FM, and engaging community elders. However, this linkage is not good enough in the area of knowledge transfer for local community outside of Mettu University. Both Mettu University students and teachers interact with external communities in regular time bases, during practicum works, practice, and field observation, project or/and assignment work, case study. As they stated, this interaction has tangible result in serving the local community especially on the issue of health and agriculture. But still there are gaps with regard to Mettu University teachers' interaction. This indicated that the interaction of Mettu University teachers with external local community is very less as compared to Mettu University students.

It is evident that even though the University instructors in Ethiopia are supposed to teach, conduct research, and engage in community service, the teaching mission takes much of their time (Semela, 2011).

Mettu University has established department of Adult Education and Community Development and engaged in training of adult education coordinators at district level who come from Oromia and Gambella region. Regarding other contributions, as one of the respondents' word,

> *It is the mandate and responsibility of AECD department to facilitate and to work/engaged more in enhancing the provision of IFAE, this department should have to enforce the University to integrate an issue of IFAE in its community engagement practices. To do so, it needs the department (AECD) first to have motivation by itself, plan what to do, then presenting it to the responsible bodies so as to change the department's plan into action.*

The community engagement plan considers the identified needs of the local community. The decision depends on the need assessment undertaken prior to the practice. As a result of this, most Mettu University's community engagement practices were implemented based on the specific needs of the local community. Its responsiveness is measured by how it solves the existing problems in the community. Accordingly, the best responsive one is the practice in the area of Health, formal schools and Agriculture.

The literature evidenced that, the curricula (formal and hidden) of universities, their choice research programs, the uses to which the outcomes are put to use, should all be planned by reference to real needs and problems in the community (Castro-Martínez, 2007)**.**

On the other hand, significant change could be seen through the involvement of Mettu University community activities/services. This involvement provided the local community to share the University's resources especially in the area of formal schools (primary and secondary), agriculture, women empowerment, health, culture, environmental protection and conservation. However, the community needs in terms of IFAE program was not considered as one of the thematic areas in Mettu University's community service issue.

This shows that no satisfactory effort is made by Mettu University from IFAE perspective. UCE is the involvement of universities with their local and regional communities in a shared process of learning, development and knowledge-making puts AE & LLL center-stage (Johnson, 2020).

As the data revealed there is Adult Education and Community Development department, trained professionals and undergraduate students in the area of IFAE, various community development programs started by Mettu University in local districts. The availability of all these resources might be an opportunity to support the provision of IFAE.

Status of Mettu University's Intervention from IFAE Perspective

The concept and the perception of community engagement varied among the academic staffs of Mettu University. Some of them explained it as it is teaching the community outside of the University during free time, whereas others defined it as it is participating in community work for the sake of development issues. There is no identified and practical engagement put for the department's teachers to take part directly in community activities rather they sometimes participate only during practicum works. This indicates that they have different perceptions on the concept of community engagement. It seems that there is no experience on the issue.

AECD department engaged in teaching undergraduate students in a way they change the theory they have learnt in the class-room into practice depending on the real context of the community they are living in. As they all said, there is no transparent/clear way set for them to change this into practice through community engagement activities. AECD department offers teachers and students opportunity to interact with the nearby district communities during practicum works in order to allow students to investigate whether or not IFAE is going on as the principle and the theory they have learnt in the class-room, and only allowed them to reflect the result of the investigation as a report. But this has no contribution for the improvement of the program except taken as the students' assignment.

Mettu University has done various things for the local community through its community engagement program to contribute to their needs especially on issues of health, agriculture, formal education, culture. However, the effectiveness of Mettu University's intervention is null/nothing when seen from IFAE perspective since it only

focused on supporting formal education areas. This indicated that the responsiveness of Mettu University's Community Engagement practices to the specific needs of the Local Community is unsatisfactory from IFAE perspective. As Duke and Hinzen (2014) stated that "there is a notion to establish networks with universities, teacher associations and civil society organizations" and work towards "improving capacity building and the professionalization of adult educators".

The result of data collected from facilitators through questionnaire indicate that, IFAE program has been given by untrained individuals, low competency (knowledge, skill and attitude) of both facilitators and coordinators, weak experience on planning, organizing, coordinating, implementing, evaluating and monitoring the program, no collaboration of the concerned body, and weak interest of the facilitators are the gaps seen/identified in the program. However, Mettu University's contribution is not as such if seen in terms of knowledge sharing/capacity building, financial support, and providing learning material resources to respond to the challenges faced by Adult Education program facilitators and coordinators at local district/zonal level.

Several challenges hindered Mettu University and its AECD Department from supporting the provision of IFAE through community engagement activities. These include: difficulty organizing advanced knowledge-sharing programs aligned with the university's community service initiatives, limited capacity to mobilize the required resources, limited interaction between department teachers and students, and lack of commitment from stakeholders. Adult educators and universities must both address the real needs of a stressed fast-changing world through community engagement activities (Duke and Hinzen, 2014).

Assessment of knowledge, skill, and ability regarding IFAE program by adult learning facilitators and AE coordinators

Table 2

The Required Competency Level of Facilitators

	Required Competency Level	*V. low*		*Low*		*Medium*		*High*		*V. high*	
		1		*2*		*3*		*4*		*5*	
		f	%	*f*	%	*f*	%	*f*	%	*f*	%
1	**Organizing stage-knowledge dimension**										
1.1	Knowledge about how adults learn and understanding the psychology of adults	9	8	86	80	12	11	_	_	_	_
1.2	Knowledge of methods in AE and learning	5	4.6	92	86	10	9	-	-	_	_
1.3	Skills in preparing value-based (democratic and humanistic) programs	7	6.5	79	74	21	20	_	_	_	_
1.4	Planning and organizational skills	4	3.7	96	90	7	6.5	-	-	-	-
1.5	Good knowledge of the subject	-	-	93	87	14	13	-	-	-	-
2	**Performance stage – skills dimension**										
2.1	Ability to motivate for learning – before, during and after the learning process	7	6.5	26	24	74	69	_	_	_	_

2.2	Development of learning environment in accordance with students' needs, focusing on self-directed learning	5	4.6	82	77	20	18.6	_	_	_	_
2.3	Skills to activate learners	-	-	22	20.5	85	79.4	-	-	-	-
2.4	Communication skills	-	-	16	15	91	85	-	-	-	-
2.5	Skills and experience in transferring subject knowledge to different target groups	17	16	76	71	14	13	_	_	_	_
3	**Evaluation stage**										
3.1	Skills in self-reflection and critical thinking	-	-	86	80	21	20	-	-	-	-
3.2	Skills in evaluating and promoting self-evaluation in oneself and students	9	8	83	77.5	15	14	-	-	-	-
3.3	Experience in using different Methods of evaluation	21	19.6	77	80	9	8	-	-	-	-
3.4	Assessment of learning needs and attainment levels	14	13	81	75.7	12	11.2	-	-	-	-

Adult learning facilitators need specific competences (skills, knowledge and attitudes) in order to carry out their (professional) tasks such as teaching, managing, program design or planning, assessment and evaluation, etc. (Buiskool *et al*. 2010; Zarifis, 2009; Zarifis, 2012). But, the results of the data analysis indicate that majority of IFAE facilitators have low knowledge about how adults learn about and understand the psychology of adults.

Facilitators should learn to incorporate methods of learning that prove effective in every learning situation. Combining methods will help both facilitators and learners to achieve better (Mohammad, 2013). However, the result of the data analysis indicate that majority of the IFAE facilitators have low knowledge of methods in AE and learning.

Facilitators are key professionals in the process and advancement of IFAE programs. As a result due attention should be given to their training to increase the acquisition of knowledge, skills and aptitude according to the levels of competency (Esayas, 2014). But, the results of the data analysis indicate that the majority of the IFAE facilitators have low skills in preparing value-based (democratic and humanistic) programs; have low planning and organizational skills; and low knowledge of the subject.

The result of the data analysis indicate that, the majority of the IFAE facilitators' ability to motivate adults for learning is at a medium level; have low skills on the area of development of learning environment in accordance with the adult learners' needs (focusing on self-directed learning); have medium skills to activate learners; and their communication skill is at medium level.

The result of the data analysis indicate that the majority of the IFAE facilitators have low skills in self-reflection and critical thinking; low skills in evaluating and promoting self-evaluation in oneself and adult learners; low level of experience in using different methods of evaluation; and low level on assessment of learning needs and attainment levels.

The required competency level of the facilitators

As the response (data) in Table 2 indicates, regarding knowledge dimension, most of the facilitators have poor/weak knowledge of the methods and knowledge about how adults learn about and understand the psychology of adults. Regarding the skill dimension, most of the facilitators do not have the necessary skills that are minimally required for their profession. Concerning evaluation stage/dimension, their response showed that most facilitators have less awareness and inexperienced on how to use different methods of evaluation.

Data obtained from facilitators through interview

Depending on the provided open-ended and close-ended interview, the sampled facilitators responded the following response accordingly.

The facilitators responded that IFAE program is not planned, organized, implemented, monitored and evaluated in a structured way at their district level. Participants stated that this was because of absence of concentration, lack of experience on the area, weak knowledge, skill, and attitude toward the program, and perceiving the program as an extra load.

There is no organized structure/connection with Mettu University in relation to community engagement/activities that provides support to their work, but very often Mettu University's AECD department offered teachers and students the opportunity to engage in practicum work at selected and nearby adult learning centers. However, this interaction has no contribution for their profession as well as for the program's improvement.

Respondents said that they did not get any knowledge sharing and/or training opportunities in relation to the required competency (knowledge, skills, attitudes, personal attributes) from Mettu University's professionals in the area of their work. Ethiopian's Ministry of Education indicates that a thirty days pre-service training on andragogy shall be given to all other newly recruited facilitators (MoE, 2011b). However, the poor training of facilitators negatively contributed to poor performance of IFAE programs.

Concerning the question on the contribution of Mettu University in terms of capacity building, material resources, and financial support: according to the responses repeatedly given by the respondents, it is difficult to state what this university/department contributed to respond to the challenges faced by Adult Education program facilitators in the entire program implementation.

There should be functional interaction between Mettu University and district education offices. Hence, Mettu University's AECD department professionals should work on capacity building or/and share their knowledge outside the university, and Mettu University should create an opportunity in which both its university teachers and students can provide service learning in the area of IFAE. Mettu University should also enhance the provision of IFAE through community engagement.

According to Fryer (2010), Community Service Learning can be used to enhance students' learning in areas such as global citizenship, critical community issues, and academic fields of knowledge. It can also be used to apply the resources of the university (people, knowledge, and methods of inquiry) to address critical

community issues (social, ecological, and economic). Further, the community service learning can be used to strengthen the capacity of the university and community organizations to engage in successful university-community partnerships and to evaluate the processes and its outcomes, and disseminate the results so that the lessons learned through the planning and implementation can benefit adult learning field.

According to the discussion held by focus group participants, IFAE program has been given in all districts of Ilubbabor Zone. It was integrated program that help adult learners to solve their problems by relating each components of the program with their daily life activities. However, due to various complex challenges, its overall implementation is very low. At their discussion, the participants raised IFAE is not going in an organized and cooperated way, no commitment among the responsible bodies.

As the researcher understood from their discussion, due to lack of trained human power in this profession (IFAE), each district education offices hired individuals who completed at least grade 10 and 12 as facilitator of adult learners. Nothing has been done to update their facilitation skills, knowledge, and attitudes. For that matter, most facilitators do not fulfill the required competency to facilitate the program, they don't have moral to stay there and they perceived the work as valueless. This is also real for program coordinators at district level. Nonetheless, there are qualified coordinators in some district who trained in the area of this profession.

As the idea revealed from group discussion, Mettu University has been working with zonal education office on some identified areas of community engagement/activities especially on providing support for formal primary and

secondary schools, but this did not include the area of IFAE. The participants' discussion highlighted that the University's presence in the local area coupled with the availability of AECD department and trained professionals in the area of Adult Education are golden opportunities to work in collaboration with Mettu University's AECD department regarding knowledge transfer.

In their final discussion, they repeatedly pointed out the need for Mettu University to integrate issues of Adult Education in its community engagement practices, showing its activities in other local community development issues. They emphasized the need for trained professionals who should tangibly share their knowledge with those untrained facilitators and coordinators, creating meaningful cooperation between Mettu University and zonal and/or district education experts. They highlighted the role of Mettu University and/or AECD department professionals in the improvement of IFAE in the future.

Summary of the Major Findings

The aim of this study was to investigate the contribution of Mettu University in enhancing the provision of Integrated Functional Adult Education (IFAE) program through Community Engagement.

The study revealed that Mettu University established an AECD department and this department was engaged in the training of education experts (IFAE Coordinators) with degrees in the regular program. This indicates that Mettu University's AECD department made significant contributions good to support the provision of IFAE, but it was only limited to the training given inside the university and did not consider the

program facilitators and adult learners outside the academia. This suggests that the department's interaction was somewhat good when seen from the students' perspective as compare to the teachers'. This shows that the contribution of the Mettu University's AECD department teachers was very low as they were not directly involved in the process and it was not functional to the level expected when seen from the university's contribution to the outside the local communities.

Offering need-based multidimensional services to the community" is the overall mission of Mettu University. It was found that Mettu University has included the area of 'Andragogy' to work on it as its third mission (community engagement). However, the university did not change this into practice to enhance IFAE program. It only focused on the training for adult education program coordinators given in regular degree program inside this university. On the other hand, significant change could be seen through the involvement of Mettu University community activities/services. This involvement provided the local community to share the University's resources especially in the area of formal schools (primary and secondary), agriculture, women empowerment, health, culture, environmental protection and conservation. However, the intervention didn't consider an issue of integrated functional adult education program.

There is no identified and practical engagement put for the department's teachers to take part directly in community activities rather they sometimes participate only during practicum works. This indicates that they have different perceptions on the concept of community engagement. It seems that there is no experience on the issue. The study disclosed that most development activities that were implemented by Mettu

University's community engagement were fruitful, and they helped the local community in various forms. However, this intervention did not touch the area of Integrated Functional Adult Education (IFAE), and but the effectiveness of this intervention was invisible when seen from IFAE perspective.

The study has indicated that there was no organized structure/connection with Mettu University in relation to community engagement/activities that provides support to their work, but very often Mettu University's AECD department offers teachers and students some opportunities by placing them to some selected nearby adult learning centers for the purpose of undertaking practicum work by undergraduate students. However, this interaction has no contribution for their profession as well as for the program's improvement. IFAE facilitators expected Mettu University's AECD department professionals to share their knowledge on the gaps they faced on the implementation of the program, but the department did not support them on the issues they need help with. As a result of this, the IFAE facilitators have undesirable attitude toward Mettu University as well as the Department of AECD.

Conclusions and Implications

Conclusions

Even if it was an opportunity to have AECD department in Mettu University, the Department was not able to transform its mandate into practice. As a result, the department did not do enough to support the provision of IFAE. Although Mettu University recognizes community service as a key area of activity so as to share a high

level of expertise with the community, its contribution to enhance the provision of IFAE is limited to the inside academia.

Mettu University developed valuable community engagement/service programs, and has made great changes on the development of the local community. However, it only focused on supporting formal education areas. As a result of this, the effectiveness of Mettu University's intervention was very low when seen from IFAE perspective. Since higher education institutions are perceived as supportive environments essential for transformation and meeting societal expectations and needs, individuals involved in the provision of IFAE expected much from Mettu University's AECD professionals to share their expertise and knowledge to help fill the gaps they faced in implementing the program. Unfortunately, the professionals were unable to do this. Consequently, the local district IFAE facilitators and coordinators developed undesirable attitude toward Mettu University's AECD department.

Implications

The potential and the contribution of AECD department professionals should be recognized by all academic staffs as well as non-academic staffs of Mettu University. AECD department should know and play its responsibilities in mobilizing every resource, and should establish strong relationships with education office experts both at zonal and at district levels.

Mettu University should integrate issues of IFAE in its community engagement practices as it has made changes in other local community development issues; it should

also motivate trained professionals to practically share their knowledge with those untrained facilitators and coordinators.

Mettu University, through its community engagement/service program, should develop valuable systems that evaluate the effectiveness of its intervention from IFAE perspective.

There should be a functional interaction between Mettu University and district education offices, AECD department professionals should work on capacity building or/and share their expert knowledge outside the university. The University should create an opportunity in which both its teachers and students can provide service learning in the area of IFAE to enhance the provision of IFAE through Community Engagement. Finally, the researchers would like to suggest that other researchers conduct wider scope studies on the issue.

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Quality of Quantitative Data in Research

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Since its establishment in 2018, the Ethiopian Journal of Behavioral Studies has published 45 empirical studies (why almost all of them empirical, not otherwise, will be discussed another time). These studies contributed securing national accreditation from the Federal Ministry of Education's task force that was established for third round journal evaluation in 2023. Of these manuscripts published since its inception in 2028, 25 of them employed quantitative data alone or together with qualitative data. These studies demonstrated data quality through using reliability coefficients. Quality of data is a necessary condition for a valid conclusion of a study. Quality of data in quantitative research is, simply and usually, shown using a quantitative index called reliability. While reliability of data is a necessary condition for validity, it is not sufficient. Validity of the data (validity of the data-also called validity of an assessment tool- is shown using reliability analysis, correlational analysis, and logical and practical analysis. It can be understood to be the overall quality of the data. As a single validity index is not used in research, single reliability index is presented commonly in quantitative empirical studies. This short communication aims to examine the common

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misunderstandings and solutions regarding reliability indices reported in EJOBS and other similar journals.

Data Collection Tools Requiring Reliability Indices

Data collection tools in quantitative research papers most commonly include questionnaire, inventory, scale, and test. It does not mean that data collected through these tools, even if standardized and validated in another country or place, qualify to meet the required reliability coefficient in the new context.

A tool with a set of questions resulting in frequencies may not necessarily produce a reliability coefficient. The first part of a tool, which is known to be demographic or socio-demographic questions, cannot have a reliability coefficient. Reliability coefficients are calculated for questions or items addressing the concept or construct under investigation. Therefore, reliability of a tool should be understood as reliability of data pertaining to those specific questions referring to the concept or construct.

Data collection tool requiring reliability coefficient is developed by other prior researcher/s, or it can be determined by the researcher for that particular research. As it is not easy to develop (including its validation) a quantitative research tool in a "theory testing" or "problem-solving" study, it is advisable to adapt or adopt a tool that was developed by others – either within or outside of a country.

It is advisable to present one or two items from each tool in the Instruments section of the Methods. Researchers should show these items in the way they would be answered by the respondents and scored by the researcher. This helps readers assess, at least, the logical or content validity of the tool.

Cronbach's Alpha and other Reliability Coefficients

Reliability of tools can be determined through different techniques depending on the uni-dimensionality of the construct: internal consistency of scores of items measuring the construct (internal consistency), the consistency of scores across times of administrations (test-retest), and the consistency of scores of raters or observers (inter-rater reliability).

Test-retest (also called stability measure), administered for a fairly long period of time between the two test conditions, is used when the construct is not assumed to be uni-dimensional. Besides, this reliability measure is necessary when the data collection tool is a single item measure.

Inter-rater reliability measure that considers two or more raters or observers or coders (though a single observer) is also possible when observing a phenomenon two or more than two times. An important condition to be met here is the equivalence of the competency of the experts or raters on the knowledge of the issue observed.

While internal consistency reliability has different types including Split-Half and Kuder-Richardson forms in the case of achievement tests scored as correct and incorrect, Cronbach's alpha is the popular one mainly because it is a default option in SPSS data analysis software (*SPSS: Analyse, Scale, Reliability Analysis*). Cronbach's alpha--where the item responses are scored as 0 or 1, or more-than-two scale values--is a generalization of Kuder-Richardson 20 (KR-20) -- where the item responses are scored as 0 or 1. As Cronbach's alpha is carried out on the assumption of uni-dimensionality of the construct of the study, this assumption should be checked using factor analysis: It can be taken as a generalization of internal consistency reliability measures (DeVellis, 2016). One has to use at least an exploratory factor analysis for

exploratory research methods, and at best a confirmatory factor analysis in the case of adopted or adapted tools, and as an extension of exploratory factor analysis when one develops own tool.

Level of Reliability Coefficient

Even if theoretically reliability coefficient is within 0 and 1, practically one can get negative reliability coefficient. Negative reliability coefficient results from items that are stated in opposite direction, but not reverse-scored when they are analyzed for the coefficient. Questions or items that are very different, or measuring different ideas, can have almost zero reliability coefficient. An acceptable reliability coefficient is 0.70 (Nunnally, 1978). This does not mean that coefficients below this number is a poor data or tool, nor is a coefficient more than .70 a guarantee for a good data or instrument.

An instrument that measures a single construct with relatively different items can have lower reliability than what one would expect. The number of items and the diversity of respondents also affect the reliability coefficient. Items with a larger number of questions can have a higher reliability coefficient than a test with lower number of items. Instruments with smaller number of items should also present the mean of the intercorrelation of the items (use, for instance, *SPSS: Analyse, Scale, Reliability Analysis, Statistics, Means*) besides the Cronbach's alpha coefficient, as Cronbach's alpha is usually less than .70 for a small number of items.

In addition,

> *Reliability is expected to be high even when the number of items is relatively small, provided the correlation among them is high. For example, a measure composed of 3 items whose average*

> *intercorrelation is .50 is expected to have an alpha of .75. The same alpha is expected for a measure composed of 9 items when the average intercorrelation among them is .25, and of 27 items when the average intercorrelation among them is .10 (Pedhazur & Schmelkin 1991, p.101).*

The characteristic of the group the instrument is administered to is also another factor in the degree or absence-or-presence, of reliability coefficient. A test administered to relatively homogeneous group on the trait has a low reliability coefficient. If a test is administered to a small number or large number of respondents with high level of similarity on the construct, the coefficient is low. For instance, very easy or very difficult exam questions can result in lower reliability coefficients.

Higher reliability coefficient should not be taken as a guarantee for a good test or data. We can get higher reliability coefficient for Cronbach's alpha by having many items or very similar (almost redundant) items. When the items of two unrelated tools (for instance, when one is self-report and the other maximal performance test like academic achievement) of distinct constructs with even low correlation are run for Cronbach's alpha, the resulting alpha can be more than the Cronbach's alpha of one or both or the average of the two measures.

The impact of lower reliability coefficients can be adjusted using coefficient of attenuation technique during correlational analysis. In this situation, the real correlation is higher than the observed correlation as reliabilities of the two variables' measures are not normally perfect, and the two measures of the two constructs are not similar.

Otherwise, method effects could inflate the correlation. Alternatively, structural equation modeling can be employed, controlling for measurement error through the measurement model of this advanced data analysis method.

Reliability Coefficient as a Variable

Reliability coefficient of a certain standardized or validated tool is understood, mistakenly by many, to be one and the same when administered to different groups of the population, or administered to different times or conditions. It, actually, varies from group to group, time to time, and condition to condition. Its variation should not be that high. A coefficient as much as .90 in the standardized tool is not expected to be less than .70 when the tool is used in another time and condition given the universality (similarity across countries) of the construct, careful adaptation/adoption and administration of the tool.

Reliability coefficient is not a property of the test but of the data. This means that even if a fixed reliability coefficient is reported during standardization or validation, one expects a different one when the tool is adapted or adopted. Let alone from one country to another, reliability should be reported for the final data of a research paper, besides the pilot reliability coefficient. Higher reliability coefficient in pilot studies is not a guarantee for the quality of the final data. The final data can be poor if the tool is administered carelessly by the test administrator, carelessly filled in by respondents, carelessly data-entered into a software, etc.

Reliability of a data for small sample size is not reliable, even if it is common to do it for test tryout or pilot testing. It should be of large sample size in which case testing it for statistical significance is not necessary (as testing of a correlation of .70

for statistical significance in sample size of, for instance, 100 or more is wastage of time: It is always statistically significant.

Reporting Reliability Coefficients in Research Papers

A reliability coefficient should be reported in the Method section of a paper. Even if every research paper may not use it, the following table can be taken as a comprehensive report of quality of the tool and its corresponding data.

Name of the construct or sub-construct	**Number of items**	**Reliability type**	**Reliability during standardization**	**Reliability of pilot study**	**Reliability of the final study**

If the groups of respondents (such as males or females) of the study are known to be different on the construct, reliability coefficients for each group should be separately presented. Even if they are not known to be different, it is safe to know if there is a difference in reliability coefficient across groups. A difference in reliability coefficient without the groups being different on the substance is an indication of "measurement error" (technically called absence of **measurement invariance** (Kline, 2011). One has to know that a difference between groups or conditions or times may not be a real difference, or a difference of content: It may be the result of measurement invaraince. As the concept and application of measurement invariance is not an easy task to be applied in journals like this one, presenting reliability coefficient for each group is a humble way of appreciating this complex process of achieving quality of a quantitative data.

As a conclusion, even if we do not have a single indicator for assessing the quality of a quantitative data in behavioral studies, it is a common practice to present reliability coefficient (mainly Cronbach's alpha) with not less than .70. As this coefficient or reliability in general is not sufficient for quality data, describing the tool clearly with at least one item, as an example, in the Methods section of the paper, and the detail procedures of administration and scoring of the instrument is important to give readers some sense of the quality of the data.

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