

Curriculum Alignment with Labor Market Demand and National Development Goals: The Case of Civil Engineering Undergraduate Program at Addis Ababa University

Adinew Ereballo Atesso (adinew.eth@gmail.com)

Department of Curriculum and Instructional Studies, Kotebe University of Education

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Abstract:

The purpose of this study was to explore the alignment of curriculum with labor market demand and national development goals, with particular focus on the civil engineering undergraduate program at Addis Ababa University (AAU). For this study, a qualitative research method was employed, particularly a single case study design. Purposive sampling technique was employed in order to collect the data from the target population. The primary data were collected through semi-structured interviews from four senior faculty members who served for more than 10 years of experience, one alumnus, one MOE official, one curriculum expert, one official acting as a client at MOE, and two project managers from construction companies through person-to-person interviews. Also, a focus group discussion was conducted with 4th and 5th year students. Besides, document analysis was also used as a secondary data source, such as published journal articles, books, and reports. The researcher systematically processed the interview data by transcribing, coding key words, grouping them into categories and themes, and summarizing the findings to prepare the research report. The findings of the study revealed that significant gaps in the AAU civil engineering curriculum leads to disconnect from national development goals and labor market demands, institutional and instructional challenges. The curriculum emphasizes theoretical knowledge but lacks practical skill training, which contributes to graduate skill mismatch with labor market demands. Institutional barriers and lack of organized feedback from stakeholders' involvement further exacerbate the problems.

Keywords: Addis Ababa University, Civil Engineering, Curriculum Alignment, Labor Market Demand, National Development Goals

1. Introduction

The term *curriculum* originates from the Latin *currere* (“to run” or “to proceed”) and refers to the course of experiences through which learners develop into mature adults (Hlebowitsh, 2004). Like any other educational concept, curriculum lacks a universally accepted definition; different scholars define the word curriculum differently depending on their philosophical, cultural contexts, experience, perspectives, and contextual setting. Curriculum can be viewed in both broad and narrow ways. In the narrow sense of the popular notion, curriculum is a set of subjects

or content taught to the students in school, college, or university. In a broad sense, curriculum consists of all experiences a learner gains in school, colleges, or the university (Sarkar, 2019). Despite variations in perceiving the term “curriculum,” according to Brady (1995, p.75) and Nunan (1988, p.4), the curriculum development process generally entails four elements: objectives, content, methods, and evaluation. Reynolds & Halpin (1982) have extended this view by considering “outcomes” as a fifth element of any curriculum by some educator.

In Ethiopia, engineering education began in 1953 with two years of intermediate program that prepared students for the degree completion abroad. In 1955, a four-year degree program was introduced, and the first B.Sc. degrees were awarded in civil and industrial engineering in 1958 (Mesfin, 2016). In developing countries like Ethiopia, civil engineering plays a vital role in national infrastructure development, which contributes to the economic development and improvement of the living standard of the people through improved livelihood and ways of investment attractions and tourism is very crucial (AAU, 2024).

Education and Training Policy (ETP, 1994) mandates curricula responsive to satisfy the country's need for skilled manpower by providing training in various skills and at different levels to meet market and development needs. This directly supports civil engineering alignment with infrastructure demands. Following this, the government adopted a new higher education policy in 2009 called the 70:30 program mix ratio, wherein 70% of the total undergraduate students enrolled in public universities join natural science fields and the remaining 30% the social science streams. Based on the policy, 40% of the students from the natural science realm must go to the engineering field (Kibrom, 2015). It has produced relatively more graduates than the current labor market can absorb. In response to challenges of homogeneity and duplication of academic programs and to improve focus and quality, it has become imperative to assess the status of higher education and design mechanisms for introducing the concept of differentiation in the Ethiopian higher education system (MOE, 2020).

National employment policy strategy (2016) coordinating education and skill development programs with contemporary labor market needs; establishing and strengthening links between higher education and training institutions and the industry human resource development workforce goals (FDRE, 2021). Similarly, based on the education and training roadmap study recommendations, MOE formulated the revised education and training policy, which mandates that higher education programs shall be launched based on national and international development needs, human resource demands of the labor market, and the needs of the sectors and industry, taking quality and relevance into account (MOE, 2023). Ethiopia's Ten-year Development Plan (2021-2030), which sets a long-term vision of making Ethiopia an “African Beacon of Prosperity”, by diversifying sources of economic growth, particularly focusing on agricultural, manufacturing, mineral, tourism, and the ICT sectors as sources of growth (FDRE, Plan Commission, 2021). These sectors require a skilled workforce, particularly in civil engineering to sustain infrastructure development.

Curriculum development requires strong collaboration among higher education institutions, industries, and professional associations to enhance curriculum relevance and graduate employability. In this regard, recent curriculum reform initiatives in Ethiopia seek to incorporate 21st-century skills such as critical thinking, creativity, communication, digital literacy, problem-solving, teamwork, and leadership (MOE, 2020). Employers consistently report a high demand for competencies, including the application of scientific and engineering principles, technical design, planning, construction, safety, and operational technologies (Shivoro et al., 2019). However, whether these essential skills are inadequately addressed in current programs remains an empirical question.

According to this study, curriculum alignment refers to the process of making sure learning objectives, activities or content match with competencies (knowledge, skill, and attitude) required by the labor market and national development goals. It is crucial to ensure graduates are equipped with the necessary competencies required in dynamic industries. However, employers frequently express doubts that university education does indeed lead to professional competence, claiming that it fails to provide students with the skills they require in the workforce (Lowden, 2011). In the same way, another study found a wider mismatch between levels of higher education supply and labor market needs for indicators of academic, technical, interpersonal, and generic skills (Teshome & Oumer, 2024). This implies that there was a persistent skill mismatch between institutional supply engineering graduates and labor market demand regarding academic, technical, interpersonal, and generic skills of the engineering graduates.

Therefore, investigating the extent to which civil engineering curriculum aligns with market demand and national development goals is essential, particularly as such alignment will ensure graduates are not only technically competent but also capable to contribute Ethiopian infrastructure planning, construction, and sustainability, which equips graduates with the required competencies to drive national long-term development

1.1 Statement of the Problem

Higher education institutions have not fully embedded curriculum alignment with market demand into curricular and extracurricular tasks, despite the growing graduate population and rising unemployment rates. In this context, the World Bank (2020) emphasizes the persistent global challenge of misalignment between university curricula and the rapidly evolving demands of the labor market. There are various policies and strategies in place to address employability both in higher education and in the labor market. However, there is a lack of coordination and integration between the education system and the labor market as well as poor actions (Shimekit & Oumer, 2021). In developing countries like Ethiopia, public sector investment is dominant because the contribution of the private sector investment in economic growth is found to be limited. Yet the Ethiopian construction industry has contributed much to reducing poverty (Federal democratic Republic of Ethiopia [FDRE], 2016), for instance, through increasing employment expansion through small- and medium-enterprise development

and job creation through the construction of low-cost houses (Tefera, 2013). The motivation behind conducting investigations on civil engineering, other than other engineering programs stem from the fact that although all engineering programs are important, civil engineering stands out due to its direct impact on national infrastructure, multidisciplinary complexity, and high societal concern and relevance of the program.

As far as I know, the existing studies have focused on harmonized civil engineering curriculum, Curriculum auditing, gaps and skill mismatch in the labor market, employability, and related areas, including curriculum auditing: Embedment of graduate capitals in Ethiopian undergraduate engineering programs' harmonized Curricula (Shimekit & Oumer, , 2021). Similarly, studies have examined employment status and education–job alignment among engineering graduates in Ethiopia, including Tamiru (2017) on policy implications, Teshome and Oumer (2024) on STEM education and labor needs, and Berhe and Tsegay (2018) on the state, determinants, and consequences of skills mismatch in the Ethiopian labor market. Moreover, other researchers have investigated employability among statistics graduates, including Ashanfi (2019) on graduates' attributes, competence, and quality of education; Herut et al. (2025) on governing higher education systems as consumable goods to enhance employability; and Haile (2019) on supply-side factors influencing employability through a tracer study of Bahir Dar University graduates. Other scholars have emphasized the practices and prospects of enhancing the employability of Addis Ababa University engineering graduates, including Jerusalem (2016) on skills gaps and mismatches in relation to private sector expectations; Teshome (2024) on the alignment between higher education skill supply and employers' skill needs in Ethiopia; and Henok (2022) on evaluating practical teaching approaches in civil engineering training among public universities from the perspective of students. This implies that these studies provide significant insight in the academic arena for knowledge generation, policy formulation, and practical indications for curriculum improvement.

Although these studies provide valuable insights into employability trends and skill mismatches, and highlight areas for improvement, they rely exclusively on qualitative approaches with small samples and lack supporting quantitative data. Methodologically, in most studies, sampling participants primarily rely on employed graduates (alumni) rather than currently enrolled university students. The studies may lack the diverse students' perspective on-the-ground, but only a few studies used students as respondents to collect data. For example (Henok, 2022). Therefore, this study seeks to fill significant gaps by incorporating lived experience and diverse perspectives of students within the education system. As there remains a notable absence of bottom-up evidence regarding student experiences on the ground, this research distinguishes itself through a methodological departure, employing Focus Group Discussion (FGD) to extract nuanced and multiple-dimensional perspectives from the students. In doing so, it investigates the practical alignment of the civil engineering curriculum at Addis Ababa University.

1.2 Objective of the Study

The overall objective of the study is to explore how key stakeholders (officials, experts, employers, alumni, faculty members, students) understand and experience the alignment of the civil engineering undergraduate curriculum at AAU with labor market demands and national development goals to identify areas of gaps in Ethiopia. Accordingly, the study addresses the following specific objectives:

- To examine how key stakeholders perceive the alignment of the AAU civil engineering curriculum with the labour market's required competencies (knowledge, skills, and attitudes) and national development goals.
- To explore how labour market demands influence the civil engineering undergraduate curriculum at AAU, based on the experiences and perspectives of key stakeholders.
- To investigate the reason behind civil engineering graduates', get difficulties in securing employment in Ethiopia.

2. Theoretical and Conceptual Framework of the Study

2.1 Theoretical Framework of the Study

A theoretical framework outlines the assumptions that guide a study and serves as the lens through which the research is developed. It grounds the research focus in established theory and provides a basis for data analysis and interpretation. In traditional research, theory is used to understand, explain, and predict phenomena (Swanson, 2013). Selecting an appropriate theoretical framework requires the researcher to consider the study's guiding principles and align the research problem accordingly. The research questions and purpose must reflect key elements of the chosen theory and be consistent with its core assumptions (Maxwell, 2004; LoBiondo-Wood, 2010). In this study, selected theories are used to examine the alignment between the undergraduate civil engineering curriculum, labor market demands, and national development goals at Addis Ababa University, providing a framework to understand the relationship among these factors.

2.1.1 System Theory

System theory emphasizes the interaction and interconnection of different parts within a system, emphasizing that educational goals can only be understood by examining how parts interact and influence one another rather than isolation. In the case of this study, as depicted in the conceptual framework, different parts, such as input, process, output, and outcome interact to produce a competent graduate. A system is composed of a whole made up of interacting parts, and therefore, systems scientists in both the natural and social sciences study the interaction between parts to better understand the complexities of reality (Lalande & Baumeister, 2015). The systems theory is analogous to the education production function. According to John (2010), education has a high-priority function in the production of human resources, and the production function is a relationship between the amount of input and intervening factors to produce a certain good, with consideration to its quality. Thus, it provides how various educational components,

including input, process, output, and outcome components, interact within a context of AAU undergraduate civil engineering curriculum alignment with market demand and national development goals to enhance program relevance and effectiveness.

2.1.2 Human Capital Theory

It is defined as the relation between the individuals' abilities, education, training, and the outcomes obtained in the labor market, in terms of wages and employment (Becker, 1993). Governments and individuals alike devote resources to education and training until the return on the most recent investment in human capital exceeds the return on investment in any other market. Besides, human capital theorists argue extensively that any resources voluntarily committed for enhancement of human capital have a definite productivity aspect (McMahon, 1999). The view of these theorists has been that schooling or training raises labor productivity through its function in increasing the abilities of workers. The outlook that elevated labor productivity is a positive function of the amount of training obtained is the main premise of human capital theory (Colcough, 1982).

The human capital theory was also articulated by Becker in 1964, who, following Adam Smith 's footsteps, saw job seekers pursuing education to increase their capability to produce and, in turn, receive higher profits. It emphasizes individuals' skills, knowledge, and experiences as a form of capital for enhancing productivity and economic performance. This theory suggests that investments in education and training enhance individuals' skills, knowledge, and abilities, consequently increasing their productivity and economic value. It emphasizes the importance of aligning educational outcomes with labor market demand. It can provide a valuable theoretical framework as a lens for exploring how undergraduate engineering curricula in Ethiopian public universities align with labor market demands and national development goals.

2.1.3 The Synthesis of Human Capital and System Theories

Human Capital theory and system theory are two distinct approaches to understand education and workforce skill development. Human capital theory focuses on the value of education in driving economic growth and productivity, and the social returns of investing in education, skills and health. On the other hand, system theory views organizations as complex systems with interconnected parts like inputs, processes, outputs, and outcomes, where a change in one part can affect the entire system. In this connection, the relationships between the parts themselves and the events they produce through their interaction become much more important, with the result that "system elements are rationally connected" (Luhmann, 1990). The integration of both theories provides a comprehensive understanding of how input-output linkage in education functions, how individuals contribute to organizational success, and how organizational structures and processes impact individual development and performance to achieve intended educational goals. They promote evidence-based planning that supports systemic alignment, coordination, and continuous improvement or responsiveness to maximize developmental outcomes. The synthesis of these theories provides useful foundation for civil engineering undergraduate curriculum alignment with labor market demand and national development goals. Therefore, this study was guided by the above-mentioned two theories, and then, system theory

was applied to understand how curriculum components (input, process, output, and outcomes) interact to cultivate required qualified and competent human capital, and capital theory used to examine how graduate productivity aligns with the labor market in the civil engineering undergraduate program at Addis Ababa University.

2.2 Conceptual Framework of the Study

According to Jabareen (2009) conceptual framework is a network, or “a plane,” of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena. It serves to understand research problems, guides the development and analysis of the research process from beginning to end to address research questions and provides recommendations based on the findings. It indicates the relationship among various variables of the problem under study. Based on the above definitions, the researcher developed a simplified visual representation of the key variables in the conceptual framework at the initial stage of the exploratory study by considering the understanding of the research problem, objectives, and methods of data collection and analysis. Thus, the following diagram describes the conceptual framework of the study.

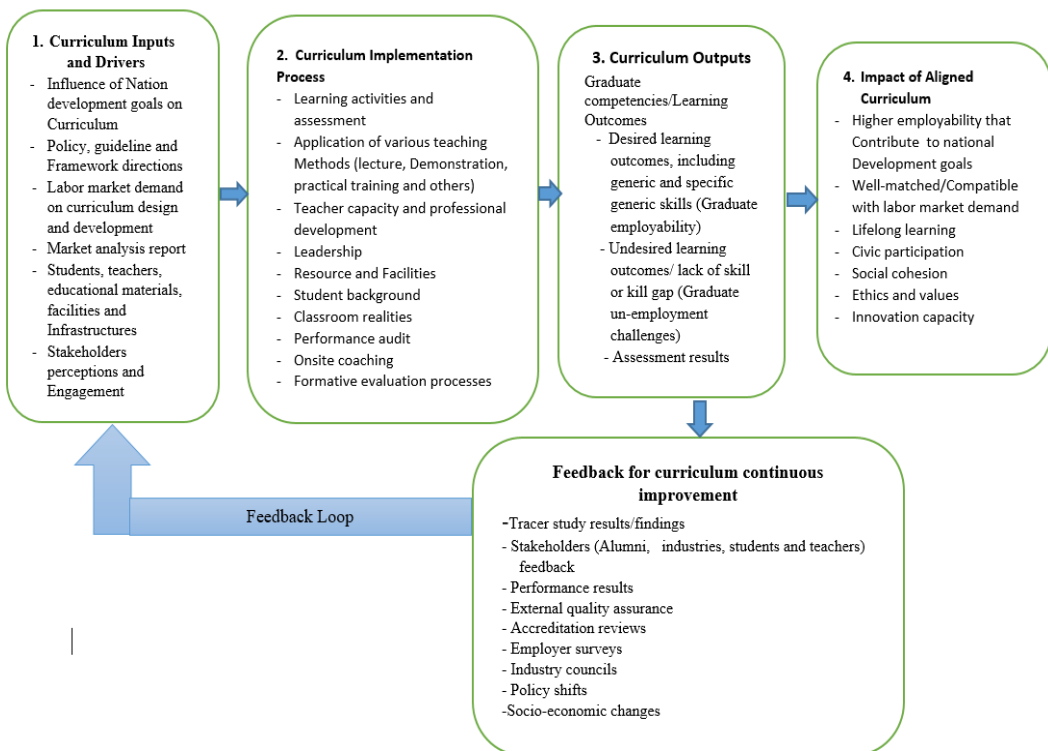


Figure 1: Conceptual Framework of Study

This conceptual framework is a mapping of the system, aligning civil engineering undergraduate curriculum with labor market demands and national development goals at AAU University,

Ethiopia. The arrows represent the flows of shared influence and relationship from the respective boxes. The expected influence indicated by each arrow shows a flow of input to each component in charge of the research problem.

3. Research Paradigm and Methods

For this research study, a social constructivist or interpretivist philosophical worldview was used as a direction to guide the research, which seeks to understand how individuals construct meaning through their lived experiences and interactions. These meanings are varied and multiple, leading the researcher to look for the complexity of views rather than narrowing meanings into a few categories or ideas (Creswell, 2018, P.46). This study adopts a qualitative single-case study design that enables an in-depth exploration of curriculum alignment with market demands and national development goals, focusing on the civil engineering undergraduate program at Addis Ababa University. Single-case study design is ideal for studying unique, accessible cases in revealing complexities that broader methods may overlook.

3.1. Sampling, Data Collection Procedures, Demographic Background and Data Analysis

3.1.1. Sampling Method

This study adopted a purposive sampling method, which allowed the researchers to gain as much insight from as many angles as possible, in-depth insight from information-rich cases (Nyimbili & Nyimbili, 2024; Patton, 2015). Participants were selected based on their roles and expertise in curriculum design, graduate performance, and labor market needs. Focus group discussion (FGD) was conducted with senior students (4th and 5th year students), which is used to gather diverse perspectives to enhance understanding of curriculum relevance and challenges as a primary data source.

3.1.2. Data Collection Procedures

The school dean and the academic unit head of the school facilitated the selection of sample teachers. Interviews were conducted with participants at their preferred venues, which were primarily in their offices. Besides, the academic unit head and eight students' representatives have been selected, mobilized and arranged sample students to participate in the FGD. Both interviews and FGD were managed by researchers. Moreover, a participant with international education experience, who previously served as Director General of the universities' construction project office and head of the schools' building project office at the Ministry of Education, and who oversees the recruitment and management of civil engineers, contributed critical stakeholder perspectives on practical alignment. Thus, that's why they were included as participants in the study. The interview was conducted deliberately to get in-depth insight from participants into the problem under study.

Semi-structured, in-depth interview questions focused on stakeholders' perceptions of graduate-required competencies, the extent of industry participation, the reasons for civil engineering graduates' employment challenges, and curriculum alignment with market demand and national development.

3.1.3. Demographic Characteristics of Participants

The demographic characteristics of respondents (MOE officials and experts, employers, teachers, instructors, and students) by sex, age, work experience, educational background, field of specialization, and responsibilities were analyzed. The study involved 10 participants, of whom 90.9% were male and 9.1% female, representing diverse professional backgrounds. Their ages ranged from below 30 to over 60 years, ensuring a mature cohort capable of providing thoughtful insights. Notably, the majority (70%) possessed more than 11 years of professional experience, contributing substantial expertise to the study. Half of the participants held PhDs and half MSc/MA degrees, which implies strong academic qualifications and professional expertise of participants in curriculum design and implementation. Although 50% specialized in civil engineering, others came from special needs education, animal production, the history of international education, and related fields, which implies a multidisciplinary perspective. Finally, responsibilities of participants included university instructors (40%), construction project managers (20%), and individual representatives from the MOE official, expert and alumnus (each 10%). This mix of academic, industry, and government perspectives is crucial for a comprehensive understanding of how curriculum aligns with market demand and national development goals.

In addition to the in-depth interview, a focus group discussion was conducted with eight AAU civil engineering undergraduate students, consisting of both 4th year and 5th year students. Of these, three of the five were males, and three were females.

Primary data sources included semi-structured interviews targeting experts with relevant roles and experience. Semi-structured interview guides questions were developed in English separately for participants such as teachers, experts, officials, employers, and alumni, depending on the nature of the roles and experiences of the participants. Primary data were collected through semi-structured interviews with 4 senior faculty members, 1 alumnus from the school of civil engineering at AAU, 1 curriculum desk head and 1 expert at MOE, and 2 project managers in the construction companies, including Ethiopian Construction Works Corporation (ECWC) and Sunshine Construction Pvt. Ltd. Co; they were large companies and major employers in absorbing civil engineering graduate in the construction sector and absorb or recruit graduate from this program regularly. In addition to the in-depth interview, a focus group discussion was conducted with 8 undergraduate Civil Engineering students, consisting of both 4th-year and 5th-year students. Of these, 5 were males, and 3 were females.

To complement the interview and focus group discussion (FGD) data, document analysis was used to explore the research problem qualitatively, focusing on social events such as data records, reports, compositions, academic work, books, periodicals, bulletins or catalogs, syllabi, films, and cartoons (Best & Khan, 2003).

3.1.4. Method of Data Analysis

For this study, the thematic analysis method was adopted to organize and analyze complex data sets systematically. It is a search for themes that can capture the narratives available in the accounts of data sets. It involves the identification of themes through careful reading and re-reading of the transcribed data (King, 2004). The process of data analysis involved coding, categorizing, and developing themes based on research questions. Finally, the data analysis process continued in a cyclical manner with reviewing data repeatedly; arranging codes, categories, and the themes, confirming relationships were identified between the themes to draw conclusions and recommendations of the study. The nature of the natural flow/process of this qualitative data analysis process was indicated in the following figure as follows.



Figure 2: *Qualitative data Reduction Process (Adapted from Arthur and Clark, 2023)*

3.2 Trustworthiness of the Study

In qualitative research, truthfulness describes the authenticity and accuracy of the data collected, the interpretations made, and the representation of participants' voices. This includes elements such as credibility, transferability, dependability, and confirmability (Ahmed, 2024). To maintain credibility of research finding, the researcher used triangulation by using multiple sources such as interview, focus group discussion, and document analysis, prolonged engagement by spending adequate time in the field to collect data, and member checking by sending back interview transcript document to collect feedback from participants, while transferability is facilitated by providing thick description and purposeful to allow for contextual comparison (Shenton, 2004). And then, by documenting the unique cultural and social factors of the civil engineering program at Addis Ababa University, the researchers provided the evidence necessary for others to assess the applicability of the findings to a similar educational setting. Besides, dependability was maintained through audit trail and the use of a dairy recording or field notes by increasing self-awareness before, during, and following data collection and analysis to minimize researcher bias, which implies the findings of the study are impartial, objective, and remain unaffected by any biases or preferences of the researcher. The researcher used direct quotations from interview transcription data to eliminate any bias, and the conclusions are supported by the data to ensure the confirmability of the research. Moreover, the researchers were committed to a continual process of examining and documenting personal diaries to prevent their own biases and preconceptions throughout the research process to confirm the reflexivity of the research. To sum up, all the above-mentioned quality assurance criteria, measures together strengthened the trustworthiness of the research, ensuring robust qualitative rigor.

4. Results

4.1. Participants' Experiences and perspectives on curriculum Alignment with labor Market Demand and National Development Goals

In this section, to ensure participants' anonymity, each participant was assigned a code identifier. The codes reflect stakeholder category and participant number. Accordingly, Stu-FD stands for student participants, FAM to Faculty members, EMP to employers, Client to CLI, ALU to Alumni, EXP to expert, and official at MOE. Besides, numbers distinguish individual participants in the data collection, and the final number depicts the year of data collection (e.g., Stu-FD-01, 2025, EMP-02, 2025) to make clear the application of codes by the researchers.

4.1.1 Theme 1: Stakeholders' Perception of Curriculum-Industry Competency Misalignment

The stakeholders' perceptions constantly indicate a significant curriculum-industry competency misalignment, which requires collaborative efforts among concerned stakeholders such as educators, industry partners, policy makers, and students to ensure that curricula are relevant, practical, aligned with the evolving needs of the labor market.

Sub-theme 1: Curriculum Design and Structure

The curriculum design and structure in Ethiopian higher education, especially for civil engineering (CEP), is a multifaceted topic influenced by national development goals, international standards, and the need to address graduate employability.

Curriculum Design Strengths and Challenges

The AAU Civil Engineering undergraduate curriculum offers a comprehensive and well-structured education that combines theoretical foundations with practical application, which includes core subjects like structural analysis, fluid mechanics, soil mechanics, and transportation engineering. This curriculum was revised in accordance with the university autonomy granted recently by the government to align with market demands and technological advancements to ensure students acquire relevant skills. In this regard, one instructor stated that *"After Addis Ababa University decided to continue as an autonomous institution, I was one of the people who participated in the curriculum review."* (FAM-02, 2025). In the same way, one instructor from AAU explained that *"I do believe that the curriculum is well designed to give the basic knowledge and skill that a graduate should have."* (FAM-04, 2025). Moreover, one interviewed employer also pointed out that *"AAU civil engineering graduates are very good at translating theory into practice."* (EMP-01, 2025).

On the other hand, the AAU civil engineering curriculum faces several challenges, including overemphasis on theory teaching over practical application, competency mismatch with labor market demand, a heavy course load, a focus on quantity over quality, and a lack of continuity. On this issue, one employer emphasized that:

Addis Ababa University has a number of courses offered with a lack of consistency in scheduling; some are delivered in the 2nd semester, others in the 3rd year, without a clear pattern. Hence, 1) Courses have no consistency, 2)

Curriculum focused on theory; in the future, it should be more focused on practical hands-on and properly organized laboratories, adequate budget, and supply of materials to be pay attention to it. (EMP-02, 2025)

On top of this, one student further explained that “*There was an inadequacy of PhD holder teachers.*” (Stu5-FD, 2025). Another student added that “*The course load in the curriculum was very heavy, with students taking 7 or 8 courses in a semester, leading to high pressure and limited time for project work. This overload affects course completion and compromises quality.*” (Stu-FD-01, 2025).

Similarly, another student added that “*Due to the abundance of courses, we are not acquiring sufficient competence but rather collecting information. For us, taking too many courses is making us weak in our practice/skills.*” (Stu-FD-02, 2025). One instructor also explained the irrelevance of curriculum courses associated with common courses that put workload pressure on students:

Sometimes the curriculum comes from the MOE, like common courses. As a result, some semesters exceed 18 credit hours, reaching up to 21 credit hours, which creates unnecessary pressure on students. To manage the load, e.g., we merged Hydraulic 1 and 2 into a single core course. We also removed hydraulic structures 1 and 2 after much debate, even though they had value for devastating students. (FAM-02, 2025)

MoE curriculum expert added that “*The curriculum might not always keep pace with the latest advancements, technologies, and methodologies used in the rapidly evolving civil engineering field.*” (EXP-01, 2025).

In conclusion, although the AAU civil engineering undergraduate curriculum is acknowledged by instructors for its solid theoretical foundation and recent revision aimed to align with market needs following the university's autonomy, it faces challenges like excessive theory focus, limited industry skills alignment, heavy course loads, outdated labs, weak course continuity, and limited practical engagement that hinder students' competences and education quality.

Sub-theme 2: Teaching-Learning Processes

The AAU Civil Engineering undergraduate program teaching-learning is perceived as heavily theory-packed, with limited practical application and access to industry-standard equipment, which resulted in students with strong conceptual understanding but lacking hands-on skills required by the civil engineering industry.

Laboratory Facilities and Practical Skill Training Gaps in CEUGP at AAU

The AAU Civil Engineering undergraduate program teaching-learning is perceived as heavily theory-packed, with limited practical application and access to industry-standard equipment, which resulted in students with strong conceptual understanding but lacking hands-on skills required by the civil engineering industry. In this context, one interviewed employer noted that “*The equipment that graduates get when they join the world of work should be made available*

in the university laboratories, but they are limited.” (EMP-02, 2025). The AAU civil engineering program at AAU faces significant challenges in delivering effective hands-on learning due to outdated laboratory facilities and poorly coordinated practical training. Although workshop training and internships are included, resource constraints and inadequate integration with theory reduce their effectiveness. Concerning this, one of the interviewed instructors emphasized that:

Most of the laboratories were old and not updated, which were established by the Germans dating back to 1972. For example, if we want to make a hydraulic model, we cannot do it because there is no budget, which affects curriculum implementation. Students do not get software and soft skills. I think teaching students without changing a single item would be a joke on students. An adequate budget should be allocated to upgrade laboratories in the future. (FAM-02, 2025)

In the same way, another instructor emphasized that “*Addis Ababa University has laboratories for undergraduate teaching at the curriculum level. Although they need to be upgraded from time to time, the laboratories are old and outdated.*” (FAM-01, 2025). Graduates often demonstrate weak construction skills due to limited exposure to actual construction processes and quality control practices. This gap affects their competence in managing construction activities and ensuring project standards on-site. On this matter, the employer participant explained that:

Technically, an internship or apprenticeship is designed to help bridge students’ practical gaps. However, these programs are neither adequately followed nor supported properly. As a result, students fail to understand purpose, and the skills gap among graduates is very wide. (EMP-02, 2025)

In this university, the civil engineering program combines laboratory and practical education across core areas such as construction materials, highway engineering, hydraulics, geotechnical, and environmental engineering, alongside various specialized labs and computer labs. It includes workshop training and internships to equip students with hands-on experience in the construction sector. However, challenges like limited equipment and space hinder the effectiveness of hands-on learning. On this issue, most students who took part in the FGDs emphasized that the university let students search for and practice on their own with no appropriate supervision, and no connection with the industries for the students (Stu-FD-08, 2025). One instructor depicted that Practical skill training in the university was hindered by broader national challenges, including low economic growth, which limits the number of construction projects, regional insecurity, which restricts access to stable training environments, free movement, and consistent industry engagement (FAM-002, 2025). In relation to this, one employer suggested that “*The curriculum is mostly focused on theory, it should be focus on the future, 50% theory and 50% practice.*” (EMP-02, 2025). Besides, one interviewed instructor noted that:

Although the curriculum was properly designed to teach students, taking students' field for visits to do practical exercises, there were obstacles, including budget constraints and security concerns. Now, if I take students to show them Tandaho Dam, it is very risky due to security problems in crossing many areas. (FAM-02, 2025)

Lack of Transferable or Soft Skills in the Curriculum

Concerning the incorporation of courses that develop soft skills such as communication, teamwork, leadership, and ethical responsibility program and curriculum expert at MOE confirmed that “Employers often seek graduates with strong communication, teamwork, problem-solving, and project management skills, which may not be sufficiently developed within the academic curriculum.” (EXP-01, 2025). These gaps limit students' ability to apply theoretical knowledge in real-world experience in construction jobs and site operations engineering contexts. The curriculum highlights the Ethiopian Building Code of Standards (EBCS), but its coverage is limited and restricts students' familiarity with local standards, potentially affecting their readiness to apply national codes effectively in professional practice. As noted, a student who participated in FGD said:

The Ethiopian building code standards (BBCS) contains 200 pages and has a lot of useful information in it but only a few contents are taught. Since EBCS is very useful for civil engineering students, it is better to make students familiar with it in the courses that are being offered in the future. (Stu-FD-04, 2025)

Moreover, another student from the FGD added that:

Civil engineering programs in the university require software, such as CADA, Open Channel, HECRAMS, PETABS, CIVIL BD, AutoCAD, MATLAB, SAFE, and CADAM, but limited exposure is given to these soft wares to improve design accuracy that enables pre-construction modeling, supports data-driven decisions, and bridges the gap between theory and practice, enhancing graduate readiness for industry demands. (Stu-FD-03, 2025)

On the other hand, one employer depicted that “the interest of students in education is very low. Students want to attend the class to maintain their attendance. Nowadays, most of the students are busy on social media.” (EMP-02, 2025).

In sum, the teaching-learning process is criticized for being overly theory-packed content with insufficient practical training, which is attributed to outdated laboratory equipment and budget constraints, insecurity and lack of coordination with industry. Most of the Participants emphasized the urgent need for modernized laboratories, increased practical learning time, and a balanced curriculum, suggesting (50% theory and 50% practice) to better prepare students for industry demand and national development

Sub-theme 3: Graduate Employability and Market Relevance***Employers' Preference for Experienced Non-qualified Individuals over New Graduates***

Currently, in Ethiopia, many employers tend to prefer field engineers with long years of practical experience over formally qualified engineers. In this connection, one student in the FGD participant indicated that *“Currently, many job advertisements are issued in Ethiopia for people who have jobs but do not consider fresh graduates who require more than 5/6 years of work experience”*. However, this trend can undermine the value of formal education and may contribute to skill gaps in technical knowledge and adherence to professional standards, which tend to lead to graduate unemployment. In relation to this, one participant noted that:

In Ethiopia, most of the construction jobs require 2-4 years of experience rather than newly qualified graduates, preferring experienced workers, even without qualifications assumed to perform better with lower salaries. This raises concerns about the value of formal education versus practical skills. (EMP-01, 2025)

Similarly, one instructor emphasized that *“the challenges graduates face when seeking employment in Ethiopia’s civil engineering sector are that job posts are more for experienced individuals, opportunities should be given for fresh graduates too.”* (FAM-04, 2025).

Graduate communication deficit

AAU civil engineering graduates face a communication deficit, hindering effective project execution and stakeholder engagement upon graduation. In the eyes of one employer:

The challenges that graduates face during the first start work is communication gaps: confusion about not knowing which department to contact for the issue they want, not knowing what they want, not knowing who to get the work plan/schedule from, (e.g., from the planning department), and not knowing who to communicate with. (EMP-02, 2025)

Limited knowledge of construction material names and quality standards among civil engineering students remains a critical challenge. Another employer also emphasized that *“The main problems of graduates that I observed are communication deficit and failure to understand the names of construction materials they know, like sponda, the side can be closed, there are things called tumbi, etc.”* (EMP-01, 2025).

In short, the study findings depict that in Ethiopia, many employers prefer experienced non-qualified workers over new civil engineering graduates with low salaries, referring to practical gaps despite academic qualifications. Moreover, fresh graduates face communication deficits and a lack of familiarity with construction and field on-site terminologies that hinder graduate work effectiveness and employability in the construction industry.

Sub-theme 4: Institutional Limitation

The civil engineering curriculum at Addis Ababa University (AAU) was not periodically revised, limiting stakeholder engagement and giving less attention to transferable skills. In this

connection, one curriculum official at MoE emphasized that “*Universities use various mechanisms to gather feedback, including industry surveys, alumni opinions through tracer study, students’ input, and professional consultations to improve civil engineering curriculum design and revision effectiveness.*” (EXP-02, 2025). Contrary to this, one teacher explained that “*I didn’t have the opportunity to receive feedback from alumni or employers.*” (FAM-04, 2025).

Therefore, the AAU Civil Engineering program faces several challenges, such as a shortage of qualified PhD-level staff, limited involvement of stakeholders, budget constraints, and obsolete laboratory equipment. This reduces per-student budget allocations, limiting the ability to provide adequate resources and modern equipment, which affects education quality and hinders progress through public-private partnerships.

4.1.2 Theme 2: AAU CEUGP Curriculum Alignment with National Development Goals

The AAU Undergraduate Civil Engineering curriculum is designed to align with Ethiopia's national development goals, particularly strategic pillars of the ten-year development plan priority areas, like quality and efficient infrastructure development. It emphasizes strengthening the domestic construction industry to increase its contribution to the country’s rapid economic and social development. It emphasizes skills in sustainable infrastructure design, construction management, and urban planning, supporting economic growth and improved living standards. The curriculum also integrates courses on environmental engineering and sustainable construction practices to promote resource efficiency and minimize environmental impact. By aligning the civil engineering curriculum with Ethiopia's development goals, AAU seems to ensure graduates are well-equipped to contribute to the nation's growth and advancement.

Sub-theme 1: AAU CEUGP Curriculum Relevance to National Priorities and Industry Needs

The AAU Civil Engineering undergraduate curriculum faces criticism for its insufficient responsiveness to national development goals and evolving industry needs. The curriculum, which includes technical subjects like structural analysis and construction management, lacks alignment with national priorities such as infrastructure expansion, housing shortages, and road development projects over the next 10 years at the expected level. Students also express concerns about the curriculum's relevance to real-world construction standards and tools, such as the Ethiopian Building Code Standards (EBCS), which are only partially covered in coursework (Stu-FD-03, 2025). This implies that the AAU civil engineering curriculum lacks structured employer engagement, insufficient integration of national policy priorities, and weak implementation of practical learning components further undermining the curriculum's relevance and effectiveness.

Sub-theme 2: AAU Civil Engineering Graduate Preparedness and Employability

AAU’s civil engineering program faces gaps in practical skills, workplace readiness, and labor market adaptability. Graduates struggle with site supervision, material selection, and project execution, highlighting a skill mismatch between university training and employer requirements like soft skills, professional communication, and teamwork, which are underdeveloped; addressing such issues is crucial for job readiness and labor market integration. In this

connection, one instructor elaborated on the issue that “*Students do not get software and soft skills. I think that the current laboratories were installed 30/40 years ago, and teaching students without changing a single item would be a joke on the students that hinders workplace readiness*” (FAM-02, 2025). Another FGD participant noted:

Currently, when job advertisements are issued in Ethiopia, they target people who already have jobs, but not for fresh graduates. Many advertisements require more than 5/6 years of work experience due to the practical experience of employees. Then I think, it would be better if university professors taught students more practical, hands-on education rather than theory-focused to enhance graduate readiness for employability (Stu-FD-08, 2025).

Furthermore, another instructor added “*There was a lack of sufficient budget for practical education and the fact that the lab equipment were old that, which caused a skill gap in the graduates. Therefore, the student should not be blamed for having a skill gap.*” (FAM-01, 2025). In this respect, one alumnus added that “*Major challenges that I faced when entering the job market as a Civil Engineering graduate in Ethiopia was lack of practical skill was the major problem that I faced while entering the market*” (ALU-01, 2025). Similarly, one employer depicted that:

We have failed due to not focusing on practical education; the quality of education is related to the knowledge we have given to students. If the education provided by universities is not supported by practical education with laboratories, it can't bring the change that we expected and graduate readiness for employability. "The food a child eats is what is seen on his/her face!" (EMP-02, 2025).

Thus, AAU civil engineering graduates lacked practical skills, software proficiency, and workplace readiness. Stakeholders, including instructors, employers, and teachers, consistently highlight outdated laboratories and facilities, insufficient hands-on training, and weak soft skills, which create a skill mismatch between university training and market demands. These, worsened by budget constraints, undermine graduate readiness and employability.

4.1.3 Theme 3: Labor Market Influence on AAU Engineering Curriculum Design and Revision

The AAU university civil engineering curriculum was revised due to the university's autonomy, aiming to align with labor market demands, incorporating employer feedback, tracer studies, and limited stakeholder consultations. However, industry influence remains limited, and curriculum revision often lags behind evolving market demands. Strengthening collaboration with employers is essential to ensure graduate relevance and employability in the labor market.

Sub-theme 1: Curriculum Responsiveness and Relevance

The AAU Civil Engineering curriculum is designed to be responsive to market demand and national development priorities, which incorporates core technical courses, stakeholder

feedback, and revision due to university autonomy to maintain relevance. Nevertheless, gaps remain in translating curriculum design into practical application due to limited industry engagement, obsolete laboratory facilities, and insufficient alignment with evolving market demands. In relation to this, one construction site client emphasized that *“My organization has ever been involved in providing feedback to AAU regarding curriculum development, including engagement through curriculum review panels, employer surveys, or professional forums”* (CLI-01, 2025). This implies that AAU is not inviting stakeholders in the civil engineering curriculum revision process to get feedback to align the curriculum with market demand.

Sub-theme 2: AAU Civil Engineering Institutional and Instructional Capacity

The AAU civil engineering academic program faces challenges in institutional and instructional capacity problems, including outdated laboratory equipment, limited practical training resources, and an insufficient budget. In this connection, one instructor explained that *“The curriculum alone is nothing without properly equipped laboratories to implement the curriculum.”* (FAM--01, 2025). Similarly, another instructor emphasized that:

The laboratories are obsolete, which limits practical experiences to change theory into practice effectively. There is also a lack of budget, so that students can't practice what they have learned in theory during their stay at the university. If there is a budget, cement is purchased for practical education, and there is a need to set up a pump and take students out to demonstrate the field, but it has been a long time since the budget for such issues has been cut (FAM-02, 2025).

In the same way, one employer suggested that:

It is good to pay attention to teaching in a balanced manner without excessive theoretical education. Besides, it is good to work in strengthening the capacity of teachers. It is also necessary to bring better-qualified teachers from foreign countries to transfer practical and technological knowledge. In the university laboratories, equipment are limited to practical education, which require sufficient budget for practical education to make education effective. (EMP-02, 2025)

One Alumnus added that *“The Instructors have less experience in practical activities and there is a gap between academic preparation and actual work in the market.”* (ALU-01, 2025). Hence, the AAU civil engineering program faces critical instructional and practical challenges due to outdated laboratory facilities, limited practical training, and an insufficient budget. Despite having qualified instructors, the lack of modern equipment and teaching materials hampers effective skill training, which hinders graduate readiness for employability

Sub-theme 3: Stakeholder Engagement and Integration of Feedback Mechanisms

The AAU Civil Engineering program appears to solicit feedback from alumni, employers, and other stakeholders through periodic surveys, industry forums, and stakeholder workshops. In relation to this point, stakeholder engagement is a crucial factor that significantly influences the

implementation of the curriculum. It is a two-way process involving consultation, empowerment, involvement, and collaboration between organizations and various stakeholders, including faculty members, administrators, students, military personnel, external agencies, and industry partners, to achieve organizational goals and objectives (Letlatsa, 2018). This mechanism helps to evaluate graduate workplace performance, identify skill gaps, and inform curriculum updates to enhance program and curriculum relevance. On this issue, one of the instructors interviewed explained that *“Yes, we get feedback from industries and professionals involved in the sector concerning students' lack of work discipline and commitment gaps; they tend to move from place to place and are not hardworking, which relates to work ethics.”* (FAM-03, 2025). Another instructor also added that *“We have now conducted a curriculum review from undergraduate up to the PhD degree. So, we get feedback through different mechanisms, such telegram channel, to get alumni and other stakeholders who will be useful for the curriculum review.”* (FAM-02, 2025). An Official from the MoE curriculum desk indicated that *“The mechanisms that are used to gather feedback from industry professionals to inform the design and revision of the civil engineering curriculum are alumni opinions, feedback from active students of the program, and consultations with professional associations.”* Further elaborating on the feedback system program and curriculum, expert MoE explained that *“Tracer studies often include gathering feedback directly from employers on the performance and preparedness of recent civil engineering graduates. This provides crucial insights into any gap between the curriculum and industry expectations.”*

However, one employer emphasized the issue that:

It would be good if the feedback mechanism were practiced and strengthened, but I have not seen it so far. Universities, by inviting industries in the form of seminars to discuss with them and employers provide feedback on graduates' performance, which is good, but that is not taken as the norm (EMP-02, 2025).

Another employer added that *“Since we spend a lot of time in the field, we do not know about the participation to provide feedback for AAU regarding curriculum design engagement through curriculum review panels, employer surveys, or professional forums”* (EMP-01, 2025).

To sum up, while some instructors and one MoE official and expert confirm AAU civil engineering has feedback mechanisms through tracer studies and stakeholder consultations, feedback received mainly highlights graduates' lack of discipline gaps, and employers report limited engagement and not being taken as a norm. In general, feedback mechanisms exist but are not consistently or systematically implemented, and stronger university-industry collaboration is needed in the future.

Sub-theme 1: Skill and Competency Gaps in Graduates

Some AAU civil engineering graduates exhibit gaps in practical skills, software proficiency, and soft skills or work competencies, including communication, project supervision, and management. These deficiencies stem from limited hands-on training due to outdated lab

equipment and insufficient budget allocation for practical education, and inadequate soft or transferable skills within the curriculum. In relation to this, a curriculum expert from MOE explained that *“The design of competencies within the civil engineering undergraduate curriculum in Ethiopia is a direct response to the nation's overarching development goals and the specific demands of its rapidly evolving labor market”* (EXP-01, 2025). On the other hand. One employer argued that: *“Concerning the AAU new graduate lacking key skills, including technical proficiency, software knowledge (e.g., AutoCAD, Civil 3D), or soft skills like communication and teamwork”* (EMP-01, 2025). Moreover, MoE program and curriculum official explained that *“Due to skill gap, civil engineering graduates challenge faces when seeking employment, which is the mismatch between the market demand (vacant positions) and the number of annual graduates from each university”* (EXP-02,2025). In the same way, another employer emphasized that *“There are problems in delivering projects on time; translating what they have learned into practice in the office or field due to a lack of standardized laboratories and budget shortages for practice leads to skill gaps”* (EMP-02, 2025). Likewise, one instructor pointed out that *“Old lab equipment has caused a skill gap in the graduates; thus, students should not be blamed for having a skill gap”* (FAM-01, 2025).

In summary, although an MOE curriculum expert and an instructor emphasized that the civil engineering curriculum is aligned with local, national and international competences, most instructors and employers pointed out that the AAU civil engineering program still exhibits gaps in practical skills, software proficiency, and soft skills or transferable skills, resulting in a significant mismatch between academic preparation and labor market expectations to possess practical skills (e.g., AutoCAD, BIM) project management and application soft skills (e.g., innovation, communication, team work) for quality infrastructure development.

Sub-theme 2: Institutional and External Constraints

The Addis Ababa University (AAU) civil engineering curriculum faces systemic and external constraints, affecting its effectiveness in preparing graduates for the industry. Systemic constraints include a shortage of qualified faculty (PhD), curriculum content overload, a theory-heavy curriculum, and insufficient laboratory facilities. External constraints include industry expectations, political instability, lack of students' interest in favor of social media, and security problems due to low economic growth, budgetary constraints, poor national technological advancements, and quality management challenges in the construction sector. In this connection, one instructor stressed that:

In Ethiopia, in about 50 universities, civil engineering programs are offered, resulting in many graduates entering the labor market that lacks sufficient economic capacity to absorb them, and insecurity. This saturation, combined with the scarcity of national construction projects, has created intense competition for limited job positions, particularly concentrated in Addis Ababa. (FAM-02, 2025).

One employer indicated that:

Construction companies in Ethiopia advertise for jobs for 4 or 5 years of work experience. If they advertise, people with civil engineering qualifications will continue to be overlooked in favour of experienced workers but non-qualified individuals, which discourages recent graduates (EMP-01, 2025).

Another instructor noted that field visits itemized in the curriculum could not be implemented due to security risks and lack of national infrastructure projects (FAM-02, 2025). An employer emphasized that:

We do construction well in Ethiopia, but we have a gap in finishing projects. This is because the laboratories are not well-equipped, and the selection of construction materials is also poor, which leads to a lack of practical training. Not only Addis Ababa University graduates but also graduates from all over universities in the country have a problem with communication skills (EMP-01, 2025).

Additionally, another employer added that “*the existence of inflation, especially the challenge of inflation to achieve project work related to the foreign exchange rate of the dollar. Because of this, the contractor contracts with a devalued currency every day, it will lead to bankruptcy.*”

In conclusion, both employer and instructor argued that AAU civil engineering graduates' unemployment is not merely a curriculum issue, but rather problems related to political instability, due to economic stagnation, limited infrastructure, and unrealistic industry expectations that restrict graduate employment opportunities.

Sub-theme 3: Economic and security Barriers

The AAU civil engineering program curriculum implementation faces insufficient budget allocation, resulting in outdated laboratory equipment and limited practical training that hinders skill development of graduates. In this connection, one instructor emphasized that “*Due to the economic problem, there was lack of projects for civil engineering graduates' employment, but as you know, the number of graduates and our roads are still small, and there is a severe shortage of houses.*” (Dda-Te-02, 2025). In the same way, the same instructor added that:

Students are not receiving the practical exercises that are included in the curriculum. Even when practical lessons are part of the curriculum, students still do not experience them, as they mainly learn through theory-focused instruction. Most of the machines used for practical training are now nonfunctional (Ibid).

Similarly, another instructor emphasized that the curriculum does not need to be linked to the unemployment of civil engineering graduates.

Most of the unemployment problems emanate from insufficient economic growth. for instance, electricity access <50%, poor water supply and sanitation, and road networks lag SDG targets, all of which require civil engineering work across sub-

disciplines. Thus, linking curriculum directly to unemployment proves challenging. (FAM-01, 2025)

Similarly, one employer explained that:

Lack of projects at the national level because of low level of economic growth in the past, there were many projects at the government level, so civil engineering graduates were in demand. However, currently, many civil engineering graduates are studying civil engineering at many Ethiopian universities, but there is a shortage of projects in the country. There is a security problem in moving and work from place to place. (EMP-02, 2025)

Therefore, the implementation of the AAU Civil Engineering curriculum is constrained by economic and security barriers. Shortage of budget and security risks limit practical training and field work, hindering skill development. Stakeholders note that graduate unemployment is more linked to national economic challenges, resulting in a shortage of projects than to curriculum design-related barriers.

5. Discussion of the Study

The findings of this study reveal a complex interaction between curriculum design, labor market demands, and national development priorities in the context of the AAU Civil Engineering undergraduate curriculum.

5.1. AAU Civil Engineering Curriculum Relevance to Labor Market Competences

Curriculum relevance is a very important aspect to fit market demands, competencies that balance theoretical foundation with practical training. In this connection, the findings of the study revealed that stakeholders acknowledged the AAU Civil Engineering undergraduate curriculum that has a strong theoretical foundation; however, this is undermined by a lack of practical skill training due to limited allocation of budget for practical education, outdated laboratory equipment, and insufficient soft skills. These findings agree with those of Mahadik (2024), who argued that universities teach important theoretical concepts crucial for understanding civil engineering principles. Yet, when it comes to applying, the researchers further noted, these theories do prepare many engineers for real-world projects, This mismatch, coupled with under-training in the critical skills of problem-solving, analytical thinking, and communication is blamed, at least in part, for the emerging high graduate unemployment and underemployment in many parts of Africa (Pauw et al., 2008). Though AAU's civil engineering curriculum provides a solid theoretical foundation, there is a pressing need to enhance practical training and skills development to improve graduate employability and better align with labor market competencies.

5.2 Influence of National Development Goals on AAU Civil Engineering Curriculum

According to the findings of the study, although the MOE curriculum expert and instructors argued that the AAU civil engineering curriculum is designed to align with market demand and Ethiopia's national development goals. However, issues like poor university-industry

collaboration, inconsistent feedback mechanisms, practical skills gaps, software proficiency and soft skills, and limited attention on transferable skills, resulted in a mismatch between academic preparation and labor market expectations, which leads to a curriculum unable to align with national development goals. These findings are consistent with those of Rajesh and Murali (2016), who found that civil engineering graduates (final-year students) mainly lack practical knowledge, communication skills, technical knowledge, application knowledge, software skills, and design. This implies that while curriculum content may be conceptually relevant, its implementation and delivery mechanisms will require significant changes to meet the growing and developing demands of the labor market.

5.3 Labor Market Influence on AAU Civil Engineering Curriculum Design

In Ethiopia's civil engineering sector, employers commonly prefer experienced non-qualified individuals over newly graduated engineers due to skill mismatch, based on the belief that practical exposure is more valuable than academic qualifications, which limits job opportunities for fresh graduates, contributing to unemployment, and undermining the role of formal education. Besides, graduates lack knowledge of construction materials, and minimal integration between theoretical learning and real-world application. These findings of the study agree with Tamiru (2017), who describes this phenomenon as an education mismatch where there is a lack of coherence between the required and offered educational level and specialization for a given job; this situation is usually termed as education–job mismatch. This education–job mismatch highlights the poor coordination among stakeholders both on the demand and on the supply sides.

Although university autonomy has enabled curriculum revision, the process lacks stakeholders' participation, which indicates poor industry-university collaboration and inconsistent feedback mechanisms that ultimately hinder graduate employability. This finding directly corresponds with Jerusalem, y. (2016), who argues that the higher education curriculum needs to be responsive to the interests of employers and take planned action to equip graduates with the required and up-to-date employability skills. For the most part, efforts for the development of employability skills and attributes should be integrated within the curriculum. This implies that strengthening stakeholder participation and industry collaboration alongside systematic integration of soft skills (communication, teamwork, problem-solving, critical thinking, adaptability, and technical proficiency, innovation, etc.) in curricula is essential to cultivate graduates who meet employers' expectations and labor market demands effectively.

5.4 Graduates' Employment Challenges

The Findings of the study revealed that Addis Ababa University (AAU) civil engineering graduates face employment challenges, which emanate from both internal and external factors. Internally, factors include shortage of PhD-qualified instructors, outdated laboratory facilities, overloaded curricula, and limited soft skills among graduates. These factors contribute to skill mismatch between university training and labour market demand, often lacking practical and employability skills despite theoretical knowledge. Externally, political instability, economic

stagnation (graduate oversupply and scarcity of national projects), inflation, feedback from key stakeholders, soft skills deficiencies, limited infrastructure, and unrealistic industry expectations further restrict/challenge graduate employment opportunities. Addressing these issues requires revitalizing curriculum content, enhancing industry collaboration, and mitigating external economic and infrastructural barriers to improve graduate readiness and employment outcomes that could align curriculum with market demand. The mismatch between higher education output/graduates and labour market absorption is a persistent problem, aggravated by the system issues in the education system and the broader socio-economic environment. These findings correspond with (Mekonnen, 2024), who described a significant discrepancy between higher education system efficacy (enrolment and graduation) and graduates' career prospects, is a significant problem.

This imbalance is expected to persist, owing in part to the ongoing political upheaval affecting employment rates. Uncertain political environments impede graduate employability and discourage investment that creates excessive unemployment, inequality, and corruption, all of which impact economic growth and job creation. This implies that addressing these challenges require realistic participation and consultation of key stakeholders in curriculum design, revision, or reform initiatives to foster job creation for civil engineering graduates in Ethiopia.

6. Conclusion

It can be concluded that stakeholders perceive AAU's civil engineering curriculum as having a strong theoretical foundation and recent revisions aimed to align with market needs, following the university's autonomy. However, there is a critical lack of practical application or insufficient hands-on training due to outdated laboratory equipment that was established in 1972 by Germans, and weak supervision during the internship. Persistent issues, including limited university-industry linkage, theory-based heavy course loads, and weak course continuity, restrict the employability skills of the graduates. These drawbacks result in a mismatch between graduate competencies to deliver given tasks in the competitive construction sector effectively.

Although the curriculum is intended to align with Ethiopia's national development goals, this alignment is limited in practice by budget constraints, inadequate infrastructure and laboratory facilities, and political instability. Most participants reported that the curriculum does not adequately prepare students to contribute to national development priorities. They attributed this to weak integration of labor market demands, insufficient emphasis on soft or transferable skills, and ineffective feedback mechanisms, all of which hinder proper alignment with national goals. Labor market demands significantly influence the effectiveness and relevance of the civil engineering undergraduate curriculum at AAU. The labor market in Ethiopia favors experienced non-qualified individuals over newly graduated civil engineers, leading to graduate unemployment and a lack of practical knowledge that limits opportunities and undermines the value of formal education. It emphasizes theoretical instruction on construction materials and has limitations due to outdated equipment, limited resources, poor industry coordination, and

inadequate supervision. This results in significant skill gaps among graduates, who struggle to integrate theoretical knowledge with practical demands in the evolving construction industry.

Civil engineering graduates from AAU face considerable employment challenges due to both internal and external barriers. Internally, the curriculum's failure to integrate soft skills and modern tools, insufficient practical training due to outdated laboratory equipment, and a shortage of PhD-level qualified instructors lead to skill mismatch with employer expectations. Externally, economic stagnation, inflation, security instability, and an oversaturated labor market further diminish employment prospects and restrict graduate employment opportunities. While feedback mechanisms such as surveys, tracer studies, and alumni channels exist, they are not consistently or systematically implemented and have minimal employer engagement and limited focus on curriculum-related gaps. Without coordinated interventions, these challenges are likely to persist and deepen graduate unemployment, which resulted in graduate oversaturation and further worsened challenges to job readiness create skill mismatch between university training and market demands that undermine graduate preparedness and employability.

7. Recommendations

- Modernize laboratory facilities and equipment to balance theoretical knowledge (50%) and practical skill (50%) and allocate sufficient budget towards practice-oriented education to minimize skill mismatch and enhance employability.
- Establish structured and institutionalized feedback mechanisms for employers and alumni through curriculum advisory boards, tracer studies, and regular industry forums to guide curriculum updates and teaching practices.
- Promote transferable skills and software (CADA, Open channel, HECRAMS, PETABS, CIVIL BD, AutoCAD, MATLAB, SAFE, and CADAM) training skills to enhance graduate employability by bridging the gap between academic training and labor market demands.
- AAU Establish a coordinating platform with MOE, construction regulators, and employers to ensure that the curriculum reflects the national priorities and regional development strategies.
- Established structured and supervised internship platforms in collaboration with construction sector stakeholders that ensure students' hands-on experience and mentorship during their study.
- AAU established income-generating enterprises and strengthened partnership with donors to address budget constraints for enhancing practical training opportunities.
- Strengthening the internal quality assurance unit and working with external quality regulatory bodies like ETA; assessing the effectiveness of curriculum implementation periodically through various mechanisms; and revising or updating the curriculum in accordance with market demand

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APPENDICES

A. List of Participant Codes, Book, and Abbreviations

S.No	Abbreviations	Full Description	Remark
1	AAU	Addis Ababa University	
2	FDRE	Federal Democratic Republic Ethiopia	
3	CEUGP	Civil Engineering Undergraduate Program	
4	HEIs	Higher Education Institutions	
5	ICT	Information Communication Technology	
6	MOE	Ministry of Education	
7	Pvt. Ltd. Co	Private limited corporation	
8	STEM	Science Technology Engineering Mathematics	

B. Interview Guide Questions for Academic Staff / Faculty Members (Sample)

1. Do you believe the current civil engineering curriculum sufficiently reflects the competencies that employers expect from graduates? Are practical skills, problem-solving abilities, and communication integrated effectively into the curriculum? (Hint: Reflect on how well the curriculum integrates practical experiences, critical thinking, and communication training.)
2. How frequently are industry partners actively involved in curriculum design and revision, and get feedback on graduate performance in the workplace in these industry interactions? (Hint: Describe the frequency and mechanisms of industry collaboration, joint workshops, graduate preparedness, and types of feedback, such as gaps in technical skills, soft skills, or new technologies and areas of training necessary.)
3. Are there any specific areas within the curriculum that you feel need further improvement to better align with labor market demands, either in terms of technical knowledge or soft skills? (Hint: Identifying areas like software tools, modern construction practices, or improved teamwork and leadership training.)
4. How are Ethiopia's national development goals, such as infrastructure expansion, environmental sustainability, and urban development, considered during the design and revision of the Civil Engineering curriculum? (Hint: Focus on integration of national goals into course content and curriculum revisions.)
5. Are there deliberate efforts to align course learning outcomes and teaching content with national priorities like road construction, dam building, housing development, and irrigation projects? (Hint: Discuss how specific projects and national needs shape course design and teaching content.)
6. What role do national plans, sector strategies, or directives from the Ministry of Education play in shaping the curriculum and influencing what you teach in your courses? (Hint: consider how national policies shape the content of specific courses).

7. In your view, does university teaching help students engage with real-world engineering challenges facing Ethiopia, such as rural connectivity, environmental management, and affordable housing? If so, how? (Hint: Provide examples of how teaching links to national challenges and helps students address real-world issues.)
8. How do you identify emerging labor market demands or skill gaps for civil engineering graduates? (Hint: Think about reviewing job postings, consulting with industry professionals, attending conferences, or reading industry reports.)
9. Have recent updates or revisions to the civil engineering curriculum have been influenced by new labor market needs, such as advancements in technology, green construction practices, or project management requirements? (Hint: Reflect on course content modifications or introduction of new modules.)
10. Have you adapted your course content for example, by integrating new technical tools, software, or real-world examples in response to feedback from employers or labor market trends? (Hint: Think about tools like AutoCAD, Revit, or project planning software being introduced in your teaching.)
11. From your experience, what challenges do graduates face when seeking employment in Ethiopia's civil engineering sector? (Hint: consider about skill gaps, lack of practical experience, or a lack of industry connections.)
12. How can the university better support students in finding employment after graduation? (Hint: Consider improvements in curriculum, industry partnerships, or career services.)
13. If any others?