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Institutional Determinants of Experiential Learning in Eastern Ethiopian Public Universities Through a Mixed Methods Study

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Abstract

Background: Experiential learning (EL) links academic knowledge to real-world practice, yet its success depends heavily on enabling institutional conditions, curriculum design, infrastructure, technology, and organizational support, rather than pedagogy alone, particularly in resource-constrained settings like Ethiopia. **Objectives:** This study examined institutional and demographic determinants of EL practices among undergraduate students in four Eastern Ethiopian public universities. **Methods:** An explanatory sequential mixed-methods design was used. Quantitative data were collected from 456 students via questionnaire (97.02% response rate) and analyzed them using descriptive statistics, correlation, multiple regression, t-tests, ANOVA, and MANCOVA. Qualitative data from 16 purposively selected interviewees were analyzed thematically. **Results:**

Institutional factors, curriculum design, infrastructure, and technological support showed strong positive correlations with and significant predictive power over experiential learning practices. Demographic variables (sex, age, CGPA, study year) had limited, largely non-significant effects, with negligible interaction effects between demographic and institutional variables. **Major Findings:** Despite reported institutional resources, students experienced substantial gaps like inadequate laboratories, infrastructure, weak university–industry linkage, poor digital integration, and restrictive administrative cultures, undermining consistent engagement in reflective and hands-on learning stages. **Conclusions:** Institutional capacity, not demographic characteristics, primarily drives experiential learning practices. Strengthening EL requires institution-wide curriculum reform, improved infrastructure, formalized industry partnerships, and enhanced administrative support to ensure equitable, meaningful experiential learning outcomes.

Keywords: Curriculum design; EL; Institutional factors; Mixed research design; University–industry linkage

1. Introduction

Experiential learning (EL) has emerged as an important paradigm in contemporary higher education because it positions learning as a dynamic process through which students transform concrete experiences into reflective understanding, conceptual knowledge, and purposeful action (Kolb, 2015). Universities increasingly employ internships, simulations, field experiences, and project-based learning to connect academic knowledge with real-world practice and to develop students' critical thinking, engagement, and employability (Nassanga et al., 2025; Zeedan, 2024). Nevertheless, evidence of the effectiveness of EL should not be interpreted as demonstrating that pedagogy alone produces successful outcomes. Rather, its benefits depend substantially on whether institutional structures enable students to experience, reflect upon, and apply what they learn. Thus, EL is not simply a classroom practice; it is also an institutional process requiring curricular coherence, adequate resources, technological capacity, and supportive organizational conditions.

This perspective is particularly relevant in Ethiopia, where policy aspirations for student-centered and experiential education coexist with substantial implementation constraints. Dejene and Tilahun (2024), for example, found that limited infrastructure and restricted access to digital resources constrain students' readiness for technology-supported learning, while Faro et al. (2025)

demonstrated that teacher support and instructional resources are important predictors of student engagement. These findings converge with international evidence regarding the importance of enabling conditions, but they also expose a contextual difference: in resource-constrained systems, institutional capacity may determine whether EL can be implemented at all, rather than merely influencing its quality. The gap between policy intentions and institutional realities therefore represents an important explanatory issue in Ethiopian higher education.

Existing scholarship, however, remains fragmented. International research frequently emphasizes pedagogical innovations and student outcomes, whereas Ethiopian studies often investigate individual institutional factors in isolation. Haile and Mekonnen (2024), for instance, showed that stakeholder engagement influences curriculum implementation but did not examine its interaction with infrastructure, technology, or other organizational conditions. Likewise, Gonfa et al. (2024) associated the rapid expansion and internationalization of Ethiopian higher education with resource pressures that can undermine practical learning. Together, these findings suggest that EL should be understood through an ecological and systems-oriented lens: curriculum, infrastructure, technology, organizational support, and stakeholder engagement may operate simultaneously and potentially reinforce or constrain one another.

Evidence from university settings further substantiates this interpretation. Hassen (2025) reported that inadequate physical infrastructure and poorly designed learning environments restrict active and experiential pedagogies. Dejene and Tilahun (2024) similarly identified technological limitations, while Zelelew et al. (2022) linked difficulties in implementing e-learning to inadequate institutional support, limited digital literacy, and insufficient technological facilities. Importantly, these studies do not entirely agree on which institutional condition is most consequential, suggesting that the determinants of EL may be context-dependent rather than universally hierarchical. Curriculum and coordination also remain problematic. Although internships, practicum courses, and other experiential components are increasingly incorporated into programs, their implementation may remain fragmented when stakeholder participation, curriculum alignment, mentoring, and resource provision are weak (Faro et al., 2025; Haile & Mekonnen, 2024).

A further gap concerns the relative importance of institutional and demographic influences. Although gender, age, and academic characteristics are commonly examined, existing evidence provides limited systematic comparison of these variables with institutional determinants. Consequently, it remains unclear whether differences in EL are primarily attributable to students' characteristics or to the environments in which learning occurs. Methodologically, much of the literature also relies on either quantitative or qualitative designs. Quantitative studies identify associations but may not explain why institutional conditions produce particular experiences, whereas qualitative studies provide contextual depth without equivalent generalizability. An explanatory sequential mixed-methods approach can address this limitation by first estimating the relative and combined influence of institutional factors and subsequently using qualitative evidence to explain the mechanisms underlying those relationships.

Accordingly, this study investigates the institutional determinants of EL through an explanatory sequential mixed-methods design. It examines how curriculum design, infrastructure, technological support, and organizational practices shape EL while comparatively considering demographic influences. By integrating statistical evidence with contextual explanations, the study moves beyond treating EL as an isolated pedagogical technique and conceptualizes it as an outcome of institutional capacity and interaction. The study therefore contributes to theory by extending understanding of the conditions under which experiential learning can occur, to policy by identifying institutional priorities, and to practice by indicating how universities can strengthen the structures necessary for meaningful learning through experience. The study was guided by five null hypotheses and one qualitative research question designed to systematically examine the institutional determinants of experiential learning among undergraduate students. Collectively, these questions explored the underlying constructs, their interrelationships, predictive contributions, and contextual influences, thereby providing an integrated basis for understanding learning transfer within higher education.

- $H0_1$: Students' engagement in ELP components (CE, RO, AC, AE) does not differ significantly from a moderate/neutral level.
- $H0_2$: Demographic variables (sex, age, CGPA) have no significant influence on students' ELP.
- $H0_3$: There is no significant relationship between institutional factors and ELP.

- $H0_4$: Institutional factors do not significantly predict ELP.
- $H0_5$: There is no significant combined (interaction) effect of institutional and demographic factors on ELP.
- How do students explain the influence of institutional factors on ELP**?**

2. Methods

An explanatory sequential mixed-methods design (QUAN → qual) was employed to rigorously investigate the determinants of EL practices among students at Dire Dewa, Haramaya, Jigjiga, and Oda Bultum Universities. The study began with a quantitative phase using a structured questionnaire to measure the level of EL and examine the effects of institution-related factors through descriptive statistics and inferential statistics. Subsequently, a qualitative phase was conducted using semi-structured interviews to explain and deepen the quantitative findings by exploring students' lived experiences, perceived barriers, and enabling conditions. This design provides strong methodological rigor by combining generalizability with contextual depth and is widely recommended for educational research seeking both explanation and interpretation (Fetters & Molina-Azorin, 2020; Ivankova, 2020; Creswell & Plano Clark, 2021).

The population comprises undergraduate students from four public universities in Eastern Ethiopia, as they were directly engaged in EL activities (practicum, fieldwork, and project-based learning). Given the heterogeneity of students across universities, colleges, departments, and years of study, determining an adequate sample size using a standard statistical formula (e.g., Yamane, 1967) ensures precision, reduces sampling error, and enhances the validity of inferences.

$$n = \frac{N_i}{1 + N_i(\alpha)^2} = \frac{4909}{1 + 4909(.05)^2} = \frac{4909}{1 + 4909(,0025)} = \frac{4909}{1 + 12.2725} = \frac{4909}{13.275} = 370 + 12\% = 414$$

$$\% = \left(\frac{n_i}{N}\right)100\% = \left(\frac{414}{4909}\right)100\% = 8.4\% = .084$$

Table 1. Population and sample size by University

University	Population (N_1)	Population (N_2)	Total Population	Sample (n_1)	Sample (n_2)	Total Sample
Dire Dawa	653	566	1,219	55	48	103
Haramaya	763	689	1,452	64	58	122
Jigjiga	590	543	1,133	50	46	96
Oda Bultum	610	495	1,105	51	42	93
Total	2,616	2,293	4,909	220	194	414

The sampling procedure employed a multistage sampling strategy to obtain a representative sample from the four selected public universities. Purposive sampling was first used to select universities and relevant colleges based on the study's inclusion criteria. Stratified sampling then ensured representation across colleges and academic disciplines, while simple random sampling reduced selection bias in identifying departments or eligible participants. Within selected departments, systematic sampling provided an orderly and transparent procedure for selecting individual graduating students from available sampling frames. From a total population of 4,909 students**,** 414 participants were proportionally allocated across Dire Dawa (103), Haramaya (122), Jigjiga (96), and Oda Bultum (93). This combination strengthened representativeness, minimized sampling bias, and improved the credibility and generalizability of the findings.

The study employed questionnaires and semi-structured interviews as complementary data collection instruments to ensure both breadth and depth of understanding within an explanatory sequential mixed-methods design. The questionnaire was appropriate for the quantitative phase as it enabled the systematic collection of standardized data from a large and diverse sample, allowing for statistical analysis of relationships between variables. It also ensured efficiency, comparability, and generalizability of findings. Semi-structured interviews were used in the qualitative phase to provide deeper insights into students' lived experiences, perceptions, and contextual factors influencing EL practices, thereby explaining and enriching the quantitative results. To ensure reliability, the questionnaire was pilot-tested, and internal consistency was assessed using Cronbach's alpha, with a threshold of $\geq .70$ considered acceptable. For interviews, reliability was enhanced through consistent use of an interview guide and careful transcription procedures. Content validity was established through expert review by specialists in education and research methodology to ensure that the instruments adequately cover all relevant dimensions of EL and its determinants. Additionally, alignment between research objectives, variables, and instrument items further strengthened validity. Overall, the combined use of these instruments enhances the rigor, credibility, and comprehensiveness of the study.

Data analysis was aligned with the explanatory sequential mixed-methods design (QUAN→qual), research questions, and null hypotheses. Quantitative analysis employed frequencies, percentages, means, and standard deviations to describe experiential learning (EL) practices. Pearson correlation assessed associations, while multiple linear regression examined the predictive effects

of institutional factors. Independent-samples *t*-tests and one-way ANOVA assessed demographic differences, whereas MANOVA and ANCOVA examined multivariate main and interaction effects. Qualitative interview data were analyzed thematically to explain, contextualize, and elaborate quantitative findings. Integration occurred during interpretation, enabling qualitative evidence to clarify significant, unexpected, or context-dependent quantitative results. This methodological integration strengthened explanatory depth, comparability, and practical relevance.

Summary Table: Data Analysis Alignment

No.	Component	Method	Purpose
1.	Level of ELP	Mean, SD	Describe status
2.	Relationships	Pearson correlation	Test associations
3.	Determinants	Multiple regression / SEM	Test H_0 and model predictors
4.	Group differences	t-test, ANOVA, MANOVA, MANCOVA	Compare groups
5.	Qualitative data	Thematic analysis	Explain findings
6.	Integration	Meta-inference	Merge results

To ensure the validity and robustness of inferential statistics, key statistical assumptions were carefully examined before analysis. Normality was assessed using skewness, kurtosis, and visual inspections (histograms and Q–Q plots) to confirm that data approximated a normal distribution. Linearity was verified through scatterplots to ensure linear relationships between independent and dependent variables. Homogeneity of variance (for group comparisons) was tested using Levene's test, while homoscedasticity in regression was examined through residual plots. Multicollinearity among predictors was checked using the Variance Inflated Factor (VIF) and tolerance values to ensure independence of predictors. Finally, outliers were identified using standardized residuals and Mahalanobis distance, and appropriately treated to avoid distortion of results. These checks strengthen the accuracy, reliability, and interpretability of the statistical findings.

Summary Table: Statistical assumptions and thresholds

No	Assumption	Method	Threshold
1.	Normality	Skewness, Kurtosis, Q–Q plots	Skewness ±2; Kurtosis ±7
2.	Linearity	Scatterplots	Linear pattern (no curves)
3.	Homogeneity of Variance	Levene's Test	$p > .05$
4.	Homoscedasticity	Residual plots	Even spread of residuals
5.	Multicollinearity	VIF, Tolerance	VIF < 10; Tolerance > 0.10
6.	Outliers	Z-scores, Mahalanobis Distance	Z ±3; Mahalanobis $p < .001$

3. Result

Of the 470 questionnaires distributed, 456 were returned complete, yielding a 97.02% response rate. This exceptionally high rate indicates strong participant engagement and effective data-

collection procedures, while minimizing concerns about nonresponse bias. Although response rate alone cannot establish representativeness, the high level of participation strengthens confidence in data completeness and provides a sound basis for subsequent statistical analysis and interpretation.

3.1. Quantitative findings

The quantitative findings present statistical evidence on the study variables, highlighting their descriptive characteristics, comparisons, relationships, predictive effects, and contributions to explaining ELP among students.

Table 3. Demographic characteristics

Variable	Category	Frequency	Percent	Cumulative Percent
I. Sex	Female	109	26.3	26.3
	Male	305	73.7	100.0
	Total	414	100.0	
II. Age	20-25	206	49.8	49.8
	25-30	178	43.0	92.8
	30-35	26	6.3	99.0
	35-40	4	1.0	100.0
	Total	414	100.0	
III. Universities	Dire Dewa	103	24.9	24.9
	Haramaya	122	29.5	54.3
	Jigjiga	96	23.2	77.5
	Oda Bultum	93	22.5	100.0
	Total	414	100.0	
IV. Colleges	CoBE	100	24.2	24.2
	CSSH	122	29.5	53.6
	CoCI	109	26.3	80.0
	CoNCS	83	20.0	100.0
	Total	414	100.0	
V. Years of study	III yrs	210	50.7	50.7
	IV yrs	204	49.3	100.0
	Total	414	100.0	

Table 3 shows that males constituted 73.7% and females 26.3%, indicating a substantial gender imbalance and greater representation of male perspectives. Regarding age, 92.8% were 20–30 years old, reflecting a predominantly young adult sample. Participants were distributed relatively evenly across universities (22.5%–29.5%), reducing potential institutional overrepresentation. By college, CSSH (29.5%) and CoCI (26.3%) had slightly higher representation, indicating reasonable disciplinary coverage. Third-year students comprised 50.7%, compared with 49.3% fourth-year students, demonstrating near parity across study levels. Collectively, the demographic profile provides broad representation of senior undergraduate students, although the gender imbalance warrants caution when interpreting gender-related patterns and generalizing findings across the wider undergraduate population.

H_{01}: Students' engagement in ELP components (CE, RO, AC, AE) does not differ significantly from either a moderate or neutral level.

Table 4. One-sample t-test for ELP components against the neutral midpoint (Test value = 3.00)

ELP Component	*Mean*	*SD*	*df*	*t*	*p*	Decision
1. Concrete Experience (CE)	3.38	1.17	413	6.61	<.001	Reject $H0_1$
2. Abstract Conceptualization (AC)	3.74	1.01	413	14.92	<.001	Reject $H0_1$
3. Active Experimentation (AE)	3.74	1.01	413	14.92	<.001	Reject $H0_1$
4. Reflective Observation (RO)	3.82	.94	413	17.75	<.001	Reject $H0_1$

All four *t*-values are large and statistically significant at $p < .001$, meaning each component's mean differs significantly from the neutral/moderate midpoint (3.00). Since all means are above 3.00, the results indicate engagement is significantly higher than neutral, not simply average or indifferent. RO shows the strongest deviation ($t = 17.75$), followed by AC/AE, then CE, which is the weakest (though still significant) component. Consequently, $H0_1$ is rejected for all four components; students' engagement in CE, RO, AC, and AE differs significantly from a moderate/neutral level, reflecting a genuinely elevated pattern of experiential learning engagement rather than uniform indifference.

H_{02}: Demographic variables (sex, age, CGPA) have no significant influence on students' ELP.

Table 6. Independent-samples t-test comparing male and female students on ELP components

ELP Component	Group	*n*	*M*	*SD*	*t*(412)	*p*	*MD*	*SE*
Concrete Experience	Female	109	16.56	5.68	−0.75	.458	−0.48	0.65
	Male	305	17.04	5.89				
Reflective Observation	Female	109	18.76	4.73	−0.87	.382	−0.46	0.53
	Male	305	19.22	4.68				
Abstract Conceptualization	Female	109	18.24	5.21	−1.06	.285	−0.60	0.56
	Male	305	18.84	4.96				
Active Experimentation	Female	109	18.24	5.21	−1.06	.285	−0.60	0.56
	Male	305	18.84	4.96				

Independent-samples *t*-tests (equal variances assumed, based on non-significant Levene's tests) showed no statistically significant gender differences across ELP components: Concrete Experience, $t(412) = -0.75$, $p = .458$; Reflective Observation, $t(412) = -0.87$, $p = .382$; Abstract Conceptualization/Active Experimentation, $t(412) = -1.06$, $p = .285$ (all $p > .05$). Mean differences were small (MD = −0.46 to −0.60) relative to their standard errors, confirming negligible practical effects and homogeneity of variance between groups. This supports $H0_2$ (retained): gender does not meaningfully influence EL. Practically, interventions to strengthen EL should be gender-neutral, targeting institutional rather than demographic factors.

Table 7. One-Way ANOVA of ELP across age groups

ELP components		*SS*	*df*	*MS*	*F*	*P*	$\dot{\eta}^2$
1. Concrete Experience	Between Groups	368.04	3	122.68	3.68	.012	.03
	Within Groups	13664.00	410	33.33			
	Total	14032.04	413				
2. Reflective	Between Groups	186.73	3	62.24	2.86	.037	.02
Observation	Within Groups	8916.22	410	21.75			
	Total	9102.94	413				
3. Abstract	Between Groups	348.35	3	116.12	4.71	.003	.04
Conceptualization	Within Groups	10105.57	410	24.65			
	Total	10453.92	413				
4. Active	Between Groups	348.35	3	116.12	4.71	.003	.04
Experimentation	Within Groups	10105.57	410	24.65			
	Total	10453.92	413				

Note. df = *degrees of freedom;* MS = *mean square; η² = eta squared (effect size). All* F-*values were statistically significant at* p < *.05, indicating group differences on each ELP component.*

A one-way ANOVA revealed statistically significant differences across age groups on all ELP components: Concrete Experience, $F(3, 410) = 3.68$, $p = .012$, $\eta^2 = .03$; Reflective Observation, $F(3, 410) = 2.86$, $p = .037$, $\eta^2 = .02$; Abstract Conceptualization/Active Experimentation, $F(3, 410) = 4.71$, $p = .003$, $\eta^2 = .04$ (all $p < .05$). However, effect sizes ($\eta^2 = .02$–$.04$) are small by Cohen's (1988) benchmarks, indicating age explains only 2–4% of variance in EL engagement. This suggests age-group differences, while statistically detectable given the sample size, carry limited practical significance. Consequently, $H0_2$ is rejected for age at the .05 level, but the modest effect sizes imply institutional rather than age-related factors remain the more substantively meaningful drivers of experiential learning engagement.

Table8. One-Way ANOVA of ELP across CGPA levels

ELP components		*SS*	*df*	*MS*	*F*	*p*	$\dot{\eta}^2$
1. Concrete Experience	Between Groups	65.24	4	16.31	.48	.752	.01
	Within Groups	13966.81	409	34.15			
	Total	14032.05	413				
2. Reflective	Between Groups	63.39	4	15.85	.72	.581	.01
Observation	Within Groups	9039.56	409	22.11			
	Total	9102.95	413				
3. Abstract	Between Groups	93.66	4	23.42	.93	.450	.01
Conceptualization	Within Groups	10360.26	409	25.33			
	Total	10453.92	413				
4. Active	Between Groups	93.66	4	23.42	.93	.450	.01
Experimentation	Within Groups	10360.26	409	25.33			
	Total	10453.92	413				

A one-way ANOVA showed no statistically significant differences across CGPA levels on any ELP component: Concrete Experience, $F(4, 409) = .48$, $p = .752$, $\eta^2 = .01$; Reflective Observation, $F(4, 409) = .72$, $p = .581$, $\eta^2 = .01$; Abstract Conceptualization/Active Experimentation, $F(4, 409)$

= .93, p = .450, η^2 = .01 (all p > .05). Negligible effect sizes (η^2 = .01) confirm CGPA explains virtually no variance in EL engagement. This supports retaining $H0_2$ for CGPA; academic performance does not meaningfully influence EL. Practically, this implies EL engagement is not achievement-dependent, so interventions need not be differentiated by students' CGPA level.

Table 9. One-Way ANOVA of ELP across colleges

ELP components	SV	*SS*	*df*	*MS*	*F*	*p.*	$\dot{\eta}^2$
1. Concrete Experience	Between Groups	53.08	3	17.69	.52	.670	.01
	Within Groups	13978.97	410	34.10			
	Total	14032.05	413				
2. Reflective Observation	Between Groups	55.94	3	18.65	.85	.470	.01
	Within Groups	9047.00	410	22.07			
	Total	9102.94	413				
3. Abstract Conceptualization	Between Groups	21.85	3	7.29	.29	.835	.002
	Within Groups	10432.05	410	25.45			
	Total	10453.90	413				
4. Active Experimentation	Between Groups	21.85	3	7.29	.29	.835	.002
	Within Groups	10432.05	410	25.45			
	Total	10453.90	413				

Table 9 shows no significant college differences in CE, $F(3, 410) = 0.52$, p = .670, η^2 = .01; RO, $F(3, 410) = 0.85$, p = .470, η^2 = .01; or AC and AE, $F(3, 410) = 0.29$, p = .835, η^2 = .002. The negligible effect sizes indicate that college affiliation explains virtually none of the variance in EL practices. Thus, students across colleges appear to experience comparable EL opportunities, suggesting relatively consistent implementation and institutional provision of experiential learning across academic disciplines.

Table 10. One-Way ANOVA of ELP across universities

Components of ELP	SV	*SS*	*df*	*MS*	*F*	*P*	$\dot{\eta}^2$
1. Concrete Experience	Between Groups	1564.48	3	521.49	17.15	.000	.11
	Within Groups	12467.57	410	30.41			
	Total	14032.05	413				
2. Reflective Observation)	Between Groups	823.69	3	274.56	13.60	.000	.09
	Within Groups	8279.26	410	20.20			
	Total	9102.95	413				
3. Abstract Conceptualization	Between Groups	957.49	3	319.17	13.78	.000	.09
	Within Groups	9496.42	410	23.16			
	Total	10453.93	413				
4. Active Experimentation (	Between Groups	957.49	3	319.17	13.78	.000	.09
	Within Groups	9496.42	410	23.16			
	Total	10453.91	413				

One-way ANOVA revealed significant university differences in CE, $F(3, 410) = 17.15$, p < .001, η^2 = .11; RO, $F(3, 410) = 13.60$, p < .001, η^2 = .09; and AC and AE, $F(3, 410) = 13.78$, p < .001, η^2 = .09. University affiliation therefore explained 9%–11% of variance, representing practically

meaningful effects. These findings indicate that EL opportunities and experiences differ substantially across institutional settings. The pattern points to institutional conditions, such as curriculum implementation, instructional practices, resources, and opportunities for practical engagement—as potentially important determinants of students' experiential learning, warranting post hoc comparisons to identify which universities differ.

H_{03}: There is no significant relationship between institutional factors and ELP.

Table 11. Pearson intercorrelations among ELC and institutional-environmental support constructs (N = 414)

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Concrete Experience	1	.76**	.76**	.73**	.74**	.76**	.72**	.76**	.76**	.74**	.74**
2. Reflective Observation		1	.77**	.74**	.75**	.77**	.73**	.77**	.77**	.76**	.75**
3. Abstract Conceptualization			1	.74**	.74**	.77**	.73**	.77**	.76**	.75**	.74**
4. Active Experimentation				1	.72**	.74**	.71**	.74**	.74**	.73**	.72**
5. Teaching Resources					1	.75**	.71**	.74**	.74**	.73**	.72**
6. Curriculum Design						1	.73**	.77**	.77**	.75**	.75**
7. Infrastructure & Facilities							1	.73**	.73**	.72**	.71**
8. University–Industry Linkage								1	.77**	.75**	.74**
9. Technological Support									1	.75**	.74**
10. Policy & Institutional Culture										1	.73**
11. Institutional Support										.	1

All 55 pairwise correlations among ELP components (CE, RO, AC, AE) and institutional constructs (Teaching Resources, Curriculum Design, Infrastructure, University–Industry Linkage, Technological Support, Policy/Culture, Institutional Support) were positive, strong, and statistically significant, $r = .71–.77$, $p < .01$, $N = 414$. Coefficients below .80 indicate meaningful association without multicollinearity, supporting discriminant validity among constructs. Consequently, $H0_3$ is rejected**:** institutional factors relate significantly to ELP. The uniformly high magnitude implies EL is not an isolated classroom phenomenon but is deeply embedded within institutional ecology, curriculum, resources, technology, and culture jointly reinforce experiential engagement. This justifies proceeding to regression analysis, since strong intercorrelations suggest institutional variables meaningfully predict, rather than merely accompany, students' ELP.

H_{04}: Institutional factors do not significantly predict ELP.

Table12a. Hierarchical multiple linear regression (HMLR) Model Summary for demographic and institutional predictors of ELP

					Change Statistics				
Model	R	R^2	Adj R^2	SEE	ΔR^2	ΔF	df1	df2	Sig. ΔF
1	.32[a]	.11	.09	18.98	.11	6.63	7	406	.000
2	.71[b]	.51	.49	14.16	.40	324.70	1	405	.000

3	.71[c]	.51	.49	14.15	.02	1.23	1	404	.269
4	.73[d]	.53	.52	13.77	.03	23.67	1	403	.000
5	.74[e]	.54	.53	13.65	.01	8.38	1	402	.004
6	.74[f]	.55	.54	13.56	.02	6.31	1	401	.012
7	.74[g]	.55	.54	13.56	.01	.71	1	400	.401
8	.75[h]	.56	.54	13.47	.01	6.43	1	399	.012

HLRM showed that demographic variables initially explained 11% of ELP variance, $R = .32$, $R^2 = .11$, $F(7, 406) = 6.63$, $p < .001$. Adding institutional factors substantially increased explanatory power to 51%, with $\Delta R^2 = .40$, $F(1, 405) = 324.70$, $p < .001$. Although Model 3 added no significant variance, $\Delta R^2 = .02$, $p = .269$, Models 4–6 and 8 produced significant incremental improvements ($\Delta R^2 = .01$–$.03$, $p \leq .012$). Model 7 remained non-significant, $p = .401$. The final model explained 56% of ELP variance ($R = .75$, $R^2 = .56$, adjusted $R^2 = .54$), demonstrating strong predictive capacity and supporting rejection of H04.

Table12b. Stepwise regression ANOVA for predicting ELP

Model		*SS*	*df*	*MS*	*F*	*P*
1	Regression	16721.53	7	2388.79	6.63	*P* <.001
	Residual	146269.69	406	360.27		
	Total	162991.22	413			
2	Regression	81807.70	8	10225.96	51.02	*P* <.001
	Residual	81183.52	405	200.45		
	Total	162991.22	413			
3	Regression	82053.69	9	9117.07	45.51	*P*<.001
	Residual	80937.55	404	200.34		
	Total	162991.22	413			
4	Regression	86543.06	10	8654.31	45.62	*P*<.001
	Residual	76448.16	403	189.70		
	Total	162991.22	413			
5	Regression	88103.84	11	8009.44	43.00	*P*<.001
	Residual	74887.38	402	186.29		
	Total	162991.22	413			
6	Regression	89263.92	12	7438.660	40.46	*P*<.001
	Residual	73727.30	401	183.86		
	Total	162991.22	413			
7	Regression	89393.82	13	6876.45	37.37	*P*<.001
	Residual	73597.40	400	183.99		
	Total	162991.22	413			
8	Regression	90561.44	14	6468.67	35.64	*P*<.001
	Residual	72429.78	399	181.53		
	Total	162991.22	413			

The hierarchical regression ANOVA confirmed that all eight models significantly predicted ELP. Model 1 was significant, $F(7, 406) = 6.63$, $p < .001$, while Model 2, $F(8, 405) = 51.02$, $p < .001$, and Model 3, $F(9, 404) = 45.51$, $p < .001$, demonstrated substantially stronger predictive performance. The significance continued through Model 8, $F(14, 399) = 35.64$, $p < .001$. Thus, the

combined demographic and institutional predictors significantly explain variation in ELP, providing sufficient evidence to reject H04. The findings underscore the importance of considering both student characteristics and institutional conditions when explaining experiential learning practices.

Table 12C. Hierarchical Multiple Regression Predicting Learning Transfer

Predictor	*B*	*SE B*	β	*t*	*p*	VIF
Constant	24.49	4.87	—	5.03	< .001	—
Sex	0.40	1.55	.01	0.26	.796	1.06
Age	−0.37	1.03	−.01	−0.36	.724	1.03
University	1.63	0.66	.09	2.50	.013	1.16
College	−0.16	0.64	−.01	−0.25	.803	1.05
Department	−0.18	0.23	−.03	−0.78	.437	1.05
Study year	1.04	1.37	.03	0.76	.447	1.06
CGPA	0.01	0.50	.01	0.02	.986	1.05
Teaching resources	1.77	0.39	.43	4.53	< .001	8.05
Curriculum design	−1.70	0.49	−.42	−3.47	< .001	7.14
Infrastructure and facilities	−1.74	0.92	−.41	−1.90	.058	6.67
University–industry linkage	0.40	0.43	.10	0.93	.354	9.09
Technological support	2.29	0.73	.58	3.13	.002	8.05
Policy & institutional culture	0.47	0.56	.10	0.84	.403	5.85
Institutional support	1.57	0.62	.37	2.54	.012	8.34

Note. *B* = unstandardized regression coefficient; *SE B* = standard error of *B*; β = standardized regression coefficient; *t* = test statistic; *p* = significance level; VIF = variance inflation factor.

The final hierarchical multiple linear regression model (Model 8) identified the unique predictors of ELP for testing H04. Teaching resources ($B = 1.77$, $SE = .39$, $\beta = .43$, $t(412) = 4.53$, $p < .001$), curriculum design ($B = -1.70$, $SE = .49$, $\beta = -.42$, $t(412) = -3.47$, $p = .001$), technological support ($B = 2.29$, $SE = .73$, $\beta = .58$, $t(412) = 3.13$, $p = .002$), institutional support ($B = 1.57$, $SE = .62$, $\beta = .37$, $t = 2.54$, $p = .012$), and universities ($B = 1.63$, $SE = .66$, $\beta = .09$, $t(412) = 2.50$, $p = .013$) significantly predicted ELP. Sex, age, colleges, departments, study years, CGPA, university–industry linkage, and policy and institutional culture were nonsignificant. Infrastructure approached significance ($p = .058$). Tolerance (.11–.97) and VIF (1.03–9.09) indicated generally acceptable multicollinearity, although some predictors warrant caution. Overall, institutional factors demonstrated stronger predictive importance than demographic characteristics. Accordingly, H04 is rejected because significant predictive relationships were evident between institutional conditions and ELP.

H_{05}: There is no significant combined (interaction) effect of institutional and demographic factors on ELP.

Table 14. Tests of Between-Subjects Effects for Concrete, Reflective, Active, and Experiential Learning Outcomes

Source	CE	RO	AC	AE
Corrected model	$F(18, 395) = 130.53$, $p < .001$, $\eta^2 = .86$	$F(18, 395) = 85.38$, $p < .001$, $\eta^2 = .80$	$F(18, 395) = 94.64$, $p < .001$, $\eta^2 = .81$	$F(18, 395) = 94.64$, $p < .001$, $\eta^2 = .79$
Sex	.04, .849, .000	1.70, .193, .004	1.67, .197, .004	1.67, .197, .004
Age	.00, .973, .000	.00, .986, .000	.54, .463, .001	.54, .463, .001
University	.75, .386, .002	1.11, .292, .003	1.17, .280, .003	1.17, .280, .003
College	.02, .891, .000	1.88, .172, .005	1.00, .319, .003	1.00, .319, .003
Department	.64, .426, .002	.48, .488, .001	.67, .412, .002	.67, .412, .002
Study year	.03, .857, .000	.28, .599, .001	.28, .599, .001	.28, .599, .001
CGPA	.57, .451, .001	3.18, .075, .008	3.36, .068, .008	3.36, .068, .008
Teaching resources	3.86, .050, .010	6.34, .012, .016	1.73, .189, .004	1.73, .189, .004
Curriculum design	.00, .984, .000	5.16, .024, .013	5.42, .020, .014	5.42, .020, .014
Infrastructure	.59, .444, .001	9.23, .003, .023	4.39, .037, .011	4.39, .037, .011
University–industry linkage	.76, .384, .002	19, .660, .000	.20, .652, .001	.20, .652, .001
Technological support	.14, .712, .000	.01, .946, .000	5.86, .016, .015	5.86, .016, .015
Policy & institutional culture	17.48, < .001, .042	.87, .353, .002	46.30, < .001, .105	46.30, < .001, .105
Institutional support	.82, .365, .002	.17, .683, .000	3.11, .079, .008	3.11, .079, .008

Note. Values are F statistics, followed by p values and partial eta squared (η^2). CE = Concrete Experience; RO = Reflective Observation; AC = Abstract Conceptualization; AE = Active Experimentation. . The table retains the effects reported in the supplied output; η^2 = partial eta squared. $R^2 = .86$ (Adjusted $R^2 = .85$) for CE; $R^2 = .80$ (Adjusted $R^2 = .79$) for RO; $R^2 = .81$ (Adjusted $R^2 = .80$) for AC and AE.

As Table 14 reveals the corrected models were statistically significant for all four outcomes: CE, $F(18, 395) = 130.53$, $p < .001$, $\eta^2 = .86$; RO, $F = 85.38$, $p < .001$, $\eta^2 = .80$; AC, $F = 94.64$, $p < .001$, $\eta^2 = .81$; and AE, $F = 94.64$, $p < .001$, $\eta^2 = .79$. Thus, H_o5 is rejected, indicating that the combined predictors were significantly associated with the four learning dimensions. For individual predictors, sex, age, university, college, department, study year, and CGPA were generally non-significant ($p > .05$); therefore, the corresponding portions of H_o5 are retained. Among institutional factors, teaching resources significantly related to RO ($F = 6.34$, $p = .012$), curriculum design to RO, AC, and AE ($p = .024$–$.020$), infrastructure to RO, AC, and AE ($p = .003$–$.037$), technological support to AC and AE ($p = .016$), and policy and institutional culture to CE, AC, and AE ($p < .001$). Hence, H_{o5} is partially rejected, while non-significant institutional effects are retained.

3.2. Qualitative Findings

This section presents qualitative findings from semi-structured interviews with 16 purposively selected students, analyzed thematically to explain and enrich the quantitative results. Four major

themes- teaching methods, support and guidance, instructional engagement, and real-world integration- emerged, each comprising distinct sub-themes with corresponding frequencies and percentages, offering deeper insight into instructor-related influences shaping students' experiential learning practices.

Research question: How do students explain the influence of institutional factors on ELP?

Table15. Thematized Qualitative Findings on Institution-Related Factors Influencing EL (n = 16)

Theme	Sub-theme	n	(%)	Brief Description
1. Teaching Resources	Adequate learning materials	8	50%	Students little bit appreciated textbooks, lab manuals, and reference materials that supported practical learning.
	Limited or outdated resources	14	87.5%	Many students reported insufficient or outdated teaching materials that hindered effective EL.
2. Curriculum Design	Practical-oriented curriculum	8	50%	Students valued courses designed with hands-on activities and applied projects.
	Rigid theoretical curriculum	13	81.3%	A majority felt that the curriculum emphasizes theory over practice, limiting skill application.
3. Infrastructure & Facilities	Adequate labs and classrooms	7	43.75%	Some students had access to well-equipped labs and learning spaces.
	Insufficient facilities	15	93.75%	Most participants reported inadequate labs, libraries, and classroom spaces for EL.
4. University–Industry Linkage	Industry exposure opportunities	6	37.5%	A few students experienced internships and industry projects.
	Weak university–industry collaboration	15	93.75%	The majority highlighted a lack of industry engagement, limiting the practical application of knowledge.
5. Technological Support	Functional IT infrastructure	9	56.25%	Students benefited from internet access, online platforms, and e-resources when available.
	Poor technological integration	13	81.3%	Many faced challenges due to unreliable internet, limited software, and outdated technology.
6. Policy & Institutional Culture	Supportive policies for EL	5	31.25%	A few students recognized policies encouraging applied learning and research.
	Bureaucratic and restrictive culture	14	87.5%	Most students described institutional culture as rigid, slowing innovation and practical learning initiatives.
7. Institutional Support	Active administrative support	7	43.75%	Some students experienced encouragement through funding, workshops, or mentorship.
	Limited institutional facilitation	15	93.75%	Many students reported minimal administrative support for EL activities.

3.2.1. Teaching resources

The qualitative findings suggest that teaching resources are inconsistently available, with 62.5% of participants acknowledging access to textbooks, lab manuals, and reference materials that facilitated hands-on learning. However, 87.5% reported limited or outdated resources, highlighting a major challenge in aligning theoretical knowledge with practical application. This finding aligns with quantitative results showing a moderate but significant effect of teaching resources on EL, indicating that resource adequacy enhances learning opportunities while resource scarcity limits engagement. Local studies in Ethiopian universities similarly report that inadequate libraries and laboratory materials hinder students' ability to engage meaningfully with experiential activities (Teshome, 2020), while international studies confirm that resource availability is strongly linked to active student participation and learning practices (Freeman et al., 2014; Kolb & Kolb, 2017).

3.2.2. Curriculum design

Curriculum design was identified as another critical institutional factor shaping EL. Half of the participants (50%) acknowledged that practical-oriented courses with applied projects enhanced their learning, while 81.3% reported a rigid, theory-focused curriculum that constrained hands-on engagement. These findings support quantitative evidence where curriculum design significantly predicts EL practices, reinforcing the claim that curricula emphasizing applied skills produce higher engagement. Nationally, Ethiopian higher education research highlights that many programs remain theoretically driven, limiting students' ability to translate knowledge into practice (Tadesse et al., 2018). Globally, EL literature emphasizes curriculum flexibility and integration of applied projects as essential for developing professional competencies (Kolb, 2015; Race, 2019).

3.2.3. Infrastructure & Facilities and University–Industry Linkage

Infrastructure and facilities were reported as major constraints, with only 43.75% of students indicating access to adequate labs and classrooms, while 93.75% described insufficient facilities that impede EL. Similarly, university–industry linkage is weak; only 37.5% reported meaningful exposure to internships or projects, whereas 93.75% identified a lack of industry collaboration. These qualitative patterns reinforce quantitative findings that infrastructure and industry linkage are strong predictors of EL practices. Locally, Ethiopian universities often face structural limitations, including overcrowded labs and limited partnerships with industries (Gebremedhin &

Tweeten, 2019). International studies support the necessity of industry collaboration and well-equipped facilities for applied learning and professional skill development (Kuh, 2008; Kolb & Kolb, 2017).

3.2.4. Technological Support and Policy & Institutional Culture

Students highlighted the critical role of technological infrastructure and supportive institutional policies. While 56.25% reported functional IT systems aiding online learning and resources, 81.3% noted challenges with poor technological integration. Regarding policy and institutional culture, only 31.25% acknowledged supportive policies promoting EL, while 87.5% described bureaucratic, restrictive environments that limit innovation. These qualitative findings correspond with quantitative analyses, demonstrating that institutional culture and technology are significant moderators of EL. National reports also note that Ethiopian universities face challenges in digital integration and policy implementation (World Bank, 2020), while international literature emphasizes that supportive institutional cultures and technology-enabled environments are critical for scalable EL (Freeman et al., 2014; Kolb, 2015).

3.2.5. Institutional Support

Finally, institutional support was largely insufficient, with only 43.75% of students reporting active administrative facilitation through mentorship, funding, or workshops, while 93.75% indicated minimal support. These findings align with quantitative results where institutional support significantly predicts EL practices. Strong administrative backing is essential to implement curriculum reforms, provide resources, and foster university–industry partnerships. Local research confirms that Ethiopian higher education institutions often lack structured support mechanisms, limiting students' applied learning opportunities (Teshome, 2020; Gebremedhin & Tweeten, 2019). Globally, institutional support is a critical determinant of effective EL, enabling both instructors and students to maximize engagement and practical skill acquisition (Kuh, 2008; Kolb & Kolb, 2017).

4. Discussion

The present study demonstrates that experiential learning (EL) in Ethiopian higher education is shaped more strongly by institutional conditions than by students' demographic characteristics. Across correlation, regression, MANCOVA, and qualitative evidence, teaching resources, curriculum design, infrastructure, technological support, university–industry linkage, policy, institutional culture, and administrative support consistently emerged as important conditions for

meaningful experiential learning practices (ELP). This pattern suggests that EL should not be understood solely as a pedagogical technique implemented by individual instructors; rather, it is an institutional process requiring coordinated curricular, material, technological, and organizational support. From a social constructivist and experiential learning perspective, students can transform experience into knowledge only when institutions provide opportunities to engage in authentic activities, reflect on those experiences, conceptualize what they have learned, and apply it in new contexts (Kolb, 2015; Kolb & Kolb, 2017).

The qualitative evidence illustrates the practical significance of these institutional constraints. Although 62.5% of students reported access to textbooks and reference materials, 87.5% described available resources as outdated or insufficient. Similarly, only half perceived their curricula as incorporating practical-oriented activities, whereas 81.3% characterized courses as rigid and theory-dominated. These findings indicate that nominal availability of educational resources does not necessarily constitute effective institutional capacity. Rather, resources must be current, accessible, relevant, and pedagogically integrated. This interpretation is consistent with Ethiopian evidence that inadequate resources, outdated facilities, and inflexible curricula constrain practical learning and the development of applied competence (Tadesse et al., 2018; Teshome, 2020). It also extends earlier African scholarship identifying structural resource deficits as persistent barriers to practice-oriented higher education (Teferra, 2016; Gebremedhin & Tweeten, 2019).

The strong positive correlations between institutional conditions and ELP further indicate that improvements in institutional readiness are associated with stronger opportunities for students to engage, practice, reflect, and apply knowledge. This finding corresponds with international research emphasizing the contribution of infrastructure, digital systems, and institutional capacity to active and experiential learning (Turnbull et al., 2023; Goodyear et al., 2025). Mabotha and Ngcamu (2025), for example, emphasize the importance of technological environments in supporting contemporary forms of learning, while Freeman et al. (2014) demonstrated the value of active engagement for learning achievement. Nevertheless, the present findings qualify a purely technology-centered interpretation. Technology cannot compensate for weak curricula, inadequate facilities, or limited institutional support. Digital platforms become educationally meaningful only when embedded within coherent pedagogical and organizational systems.

The regression findings provide stronger evidence that institutional conditions have explanatory value beyond demographic characteristics. Teaching resources, curriculum design, technological support, institutional support, and university affiliation significantly predicted ELP, whereas sex, age, college, department, study year, CGPA, university–industry linkage, and policy and institutional culture were generally nonsignificant in the final predictive model. Curriculum design was particularly important because experiential learning requires deliberate opportunities for students to move between experience, reflection, conceptualization, and experimentation. A curriculum dominated by theoretical transmission therefore restricts the very processes through which experiential learning is expected to occur. This interpretation is compatible with Tadesse et al. (2018) and Wilson et al. (2024), who emphasize curriculum reform, active learning, and stronger alignment between academic preparation and practical competence.

At the same time, the regression results require a cautious interpretation. A significant regression coefficient establishes statistical prediction, not causation. Moreover, university–industry linkage and policy and institutional culture were not significant unique predictors after other institutional variables were controlled, despite their importance in the qualitative accounts. This apparent discrepancy is theoretically meaningful rather than contradictory. Some institutional conditions may operate indirectly, overlap with other predictors, or become influential only through their contribution to curriculum implementation, technological access, or administrative support. The relatively high VIF values for some institutional predictors also suggest that their effects should not be interpreted as completely independent. Thus, institutional capacity is best conceptualized as an interconnected system rather than a collection of isolated determinants.

The MANCOVA findings provide an additional and important perspective. The overall models were highly significant across Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation, with very large overall effect sizes. However, demographic variables showed negligible and non-significant interaction effects. This finding indicates that the relationship between institutional conditions and ELP does not substantially vary according to students' sex, age, CGPA, college, department, or study year. In this respect, the institutional environment appears to function as an equalizer: when meaningful learning opportunities are available, students from different demographic groups can potentially benefit

from them. Conversely, inadequate institutional provision may constrain students regardless of individual academic characteristics.

This finding is broadly consistent with research emphasizing institutional quality as a condition for inclusive participation in higher education (Aina et al., 2025; Goodyear et al., 2025). However, it also challenges explanations that attribute differences in experiential learning primarily to individual student characteristics. The absence of substantial demographic interactions does not mean that demographic characteristics are irrelevant; rather, it suggests that institutional conditions may be more consequential for explaining variation in ELP. Accordingly, interventions directed exclusively at students—for example, expecting greater motivation or adaptability—may have limited effects when students encounter inadequate laboratories, rigid curricula, weak digital systems, or restricted opportunities for practical engagement.

The second major issue concerns infrastructure, technological support, and university–industry linkage. Only 43.75% of students reported adequate laboratories and classrooms, while 93.75% identified infrastructure inadequacy. Likewise, only 37.5% reported participation in internships or industry projects, compared with 93.75% reporting inadequate university–industry collaboration. Technological conditions showed a similar contradiction: although 56.25% reported functional IT infrastructure, 81.3% experienced poor integration of digital resources. These findings demonstrate that physical availability and functional educational integration are not synonymous. Infrastructure may exist without being sufficiently equipped, accessible, maintained, or connected to curriculum requirements.

The findings are consistent with Ethiopian and African evidence concerning overcrowded facilities, limited digital resources, and weak university–industry collaboration (Teshome, 2020; Teferra, 2016; Gebremedhin & Tweeten, 2019). They also correspond with international evidence that well-designed technological and physical environments facilitate active, blended, and experiential learning (Turnbull et al., 2023; Goodyear et al., 2025). However, the present study extends this literature by demonstrating that infrastructure should be interpreted as part of an institutional ecology. Laboratories, digital technologies, industry placements, curriculum design, and administrative support are mutually reinforcing. A university may possess modern equipment but still provide weak EL if students have limited opportunities to use it meaningfully.

The third major finding concerns policy, institutional culture, and administrative support. Only 31.25% of participants recognized policies explicitly promoting EL, while 87.5% reported bureaucratic or restrictive institutional cultures. Although 43.75% perceived some administrative support, 93.75% described institutional facilitation as inadequate. These findings suggest a substantial implementation gap between institutional aspirations and operational practice. Policy documents alone cannot sustain EL; policies must be translated into funding, workload arrangements, flexible procedures, mentoring, partnerships, and accountability mechanisms. This interpretation is compatible with Kolb and Kolb (2017), Kuh (2008), and Race (2019), who emphasize institutional structures and supportive learning environments as foundations for sustained active learning. The findings do not support the interpretation that institutional factors necessarily *moderate* demographic differences. The MANCOVA results showed that demographic interaction effects were largely non-significant. Therefore, the more defensible conclusion is that institutional conditions have6 strong main effects and predictive relationships with ELP while operating relatively consistently across demographic groups. This distinction is important because moderation requires a statistically significant interaction term. The present evidence instead supports the proposition that institutional quality is broadly consequential across student groups.

In short, the convergence of quantitative and qualitative evidence strengthens the interpretation that ELP is fundamentally embedded in institutional capacity. The qualitative findings explain why the statistical relationships exist: students cannot readily transform theoretical knowledge into practical competence when resources are outdated, curricula are rigid, infrastructure is inadequate, digital systems are poorly integrated, and administrative procedures restrict experimentation. At the same time, the quantitative findings establish that these institutional conditions are not merely isolated student perceptions; they are systematically associated with variation in ELP. Theoretically, the findings reinforce experiential learning theory by demonstrating that the cycle of experience, reflection, conceptualization, and experimentation depends partly on the institutional environment in which that cycle occurs (Kolb, 2015). Practically, they imply that strengthening EL requires institutional reform rather than isolated classroom interventions.

5. Conclusions

Universities should redesign curricula toward practice-oriented, competency-based learning by integrating internships, projects, simulations, fieldwork, and industry-informed assessment.

Institutions should simultaneously strengthen laboratories, classrooms, libraries, learning materials, and reliable internet infrastructure to facilitate authentic experiential learning. Formal university–industry partnerships should provide structured internships, cooperative education, joint projects, and practitioner participation in curriculum development. Clear experiential learning policies should be supported through dedicated funding, administrative facilitation, staff development, mentoring, and systematic monitoring. Given the negligible demographic interaction effects, reforms should be implemented institution-wide rather than targeted by sex, age, CGPA, or study year. Such coordinated investment would strengthen conditions for meaningful, equitable, and sustainable experiential learning.

6.Limitations and Future Research

Several limitations should be acknowledged. The qualitative sample of 16 students provided valuable contextual insights but limits transferability beyond the participating institutions. Reliance on self-reported data may have introduced perceptual and common-method bias, particularly in assessing institutional conditions. The cross-sectional design permits interpretation of associations and predictive relationships but not causal effects. Institutional differences across universities, colleges, and departments may also exceed those captured by the measured variables. Relatively high VIF values suggest some overlap among institutional predictors. Future research should employ longitudinal, multi-institutional, and mixed-data designs incorporating observational and institutional evidence. SEM, multilevel, and quasi-experimental approaches could further examine causal pathways and evaluate curriculum, technological, infrastructural, and university–industry interventions.

Funding Declaration

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Ethical Approval

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (1975) and the applicable guidelines of the institutional research ethics committee. Ethical approval was obtained from the Haramaya University Institutional Research Review Committee(HUIRRC29/0926), and the study was conducted in accordance with its approved

ethical procedures, including informed consent, voluntary participation, confidentiality, privacy, and the right to withdraw without penalty.

Accordance Statement

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki (1975), applicable to Haramaya University institutional research ethical guidelines, and principles of informed consent, voluntary participation, confidentiality, and protection of participants' rights.

Consent to Participate

Written informed consent was obtained from all participants before data collection. Participants were informed about the purpose and procedures of the study, their voluntary participation, confidentiality, and their right to withdraw at any time without penalty.

Consent for Publication

Not Applicable.

Clinical Trial Registration

Not applicable.

Data Availability

The datasets generated during the current study are available from the corresponding author upon reasonable request.

References

Alemayehu, G., & Chen, H. (2021). Teacher-centered versus student-centered learning in Ethiopian higher education. *International Journal of Instruction, 14*(2), 123–140.

Araújo, A. A., Kalinowski, M., & Baldassarre, M. T. (2026). EL in postgraduate education: Fostering professional skills and entrepreneurial mindsets. *International Journal of Educational Development, 45*(4). 67-89.

Bekele, A., Melese, W., & Sime, T. The effect of the blended learning approach on students' learning engagement at Jimma Teachers' College, Ethiopia. *Discov Educ* 4, 327 (2025). https://doi.org/10.1007/s44217-025-00564-w

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage.

Creswell, J. W., & Plano Clark, V. L. (2021). *Designing and conducting mixed methods research* 3rd ed.). SAGE.

Dejene, W., & Tilahun, D. (2024). How ready are students for e-learning? Evidence from Ethiopia.

Discover Education, 3, 283.

de Leeuw, E., Hox, J., & Dillman, D. A. (2017). *International handbook of survey methodology*. Routledge.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2020). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). Wiley.

Faro, M.H, Gutu, T.S., Hunde, A.B. (2025). Major factors influencing student engagement in Ethiopian higher education institutions: Evidence from one institution. *PLoS ONE 20*(2): e0318731. https://doi.org/10.1371/journal.pone.0318731

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Fetters, M. D., & Molina-Azorin, J. F. (2020). Mixed methods research in educational studies. *Journal of Mixed Methods Research*, *14*(2), 131–144.

Gebremedhin, B., & Tweeten, L. (2019). University–industry linkage and education practices in contexts. *African Development Review, 31*(2), 145–158.

Gobena, G. (2025). Assessing The Implementation Level of EL among Undergraduate Students at Haramaya University, Ethiopia. *International Journal of Education Teacher*, *29*, 67–79. https://doi.org/10.20544/teacher.29.08.

Goodyear, A., Tang, J., Huang, P., and Yan, S. (2025). Digital transformation in higher education: logical framework, practical dilemmas, and implementation approaches. *Front. Psychol. 16*:1565591. doi: 10.3389/fpsyg.1565591

Gonfa, D. K., Gibbons, P., Sugrue, C., & Kuma, B. (2024). Internationalizations of higher education in Ethiopia: A strategic process? *Journal of Studies in International Education, 28*(4); 87-98

Groves, R. M., Fowler, F. J., Jr., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2016). *Survey methodology* (2nd ed.). Wiley.

Haile, T. M., & Mekonnen, E. A. (2024). Impacts of stakeholder engagement on curriculum implementation in Ethiopian Defense University. *Pedagogical Research, 9*(2).65-78

Hassen, M. Z. (2025). Rethinking the physical environment and pedagogical approaches in Ethiopian higher education. *Science Research, 13*(3), 32–42.

Ivankova, N. V. (2020). *Mixed methods applications in action research: From methods to community action*. SAGE Publications.

Kassa, T., Andualem, T., Desie, Y., Admas, F., Minaye, A., Teklu, F., … Zeleke, S. (2025).

Practices of active learning in public universities in Ethiopia: student and faculty perceptions. *Studies in Higher Education*, 50(3), 494–504. https://doi.org/10.1080/03075079.2024.2343953

Kolb, D. A. (2015). *EL: Experience as the source of learning and development* (2nd ed.). Pearson.

Kolb, A. Y., & Kolb, D. A. (2017). EL theory as a guide for experiential educators. *Journal of Experiential Education, 40*(1), 7–44.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter.* Association of American Colleges and Universities.

Mabotha, P. A. P., & Ngcamu, B. S. (2026). Digital Transformation in the Higher Education Sector: A Systematic Literature Review. *Administrative Sciences, 16*(1), 1. https://doi.org/10.3390/admsci16010001

Ministry of Education (MoE). (2023). *Ethiopian higher education policy framework*. Addis Ababa.

Nassanga, L., Uwineza, M. H., & Nansobya, J. (2025). The power of EL in shaping future leaders. *International Journal of Research in Education Humanities and Commerce, 6*(5), pp. 67-78

Negi, K. G., Dichaba, M. M., & van Der Nest, A. (2025). Promoting lifelong learning in Ethiopia higher education institutions: insights from colleges of education and strategies for improvement. *Cogent Education*. https://doi.org/10.1080/2331186X.2025.2571685

OUCi. (2025). EL in higher education: The role of simulations. *The International Journal of Management Education, № 2, p. 100968*

Race, P. (2019). *The lecturer's toolkit: A practical guide to assessment, learning and teaching* (5th ed.). Routledge.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th) ed.). Pearson.

Tadesse, T., Manathunga, C., & Gillies, R. M. (2018). Quality teaching and learning in Ethiopian higher education. *Higher Education Research & Development, 37*(3), 571–585.

Tadesse, T., Ware, H., Asmare, A., & Gillies, R. M. (2024). Enhancing Student Engagement and Practices: The Effects of Cooperative Learning in an Ethiopian University's Classrooms. *Education Sciences, 14*(9), 975. https://doi.org/10.3390/educsci14090975

Tafesse, M. (2021). Organizational Learning Practices in Public Higher Education Institutions of Ethiopia. *Technium Science, 1*(1), pages 55-78.

Tegegne, W.A., Bizuneh, S.M., & Negasi, R.D. Exploring the promises and classroom realities of constructivist learning at upper primary school in Ethiopia. *Discov Educ* 4, 513 (2025). https://doi.org/10.1007/s44217-025-00967-9

Teferra, D. (2016). African higher education in the global knowledge economy. *International Journal of African Higher Education, 3*(1), 1–15.

Teressa, T. D. (2022). University–industry linkages and EL in Ethiopia. *Creative Education*.

Teshome, Y. (2020). Quality and relevance of higher education in Ethiopia. *Ethiopian Journal of Education, 40*(1), 1–24.

Tizazu, S. A., & Ambaye, D. W. (2019). Learning styles and academic achievement in Ethiopia. *European Journal of Education Studies*.

Turnbull, D., Chugh, R., Cowling, M.A. *et al (2023).* Implementing educational technology in Higher Education Institutions: A review of technologies, stakeholder perceptions, frameworks and metrics. *Educ Inf Technol,* 28, 16403–16429. https://doi.org/10.1007/s10639-023-11846-x

Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences, 111*(23), 8410–8415.

Wenger-Trayner, E., & Wenger-Trayner, B. (2020). *Learning to make a difference: Value creation in social learning spaces*. Cambridge University Press.

Wondimu, Y. A. (2022). EL practices among teachers in Ethiopia. *Heliyon*, *10* (4), 89-107.

World Bank. (2020). *Ethiopia education sector analysis: Higher education and skills development*. World Bank Publications.

Yoseph, A. A. (2024). Learning environments and EL in Ethiopian universities. *Unisa Thesis*.

Zeedan, R. (2024). Student engagement and success through EL. *Frontiers in Education, 9*, 1497045.

Zelelew, H., Teshome, Z., Tadesse, T., & Keleta, Y. (2022). E-learning implementation in Ethiopian higher education. *Industry and Higher Education, 20*(2).89-109.