



Effect of attitudinal and professional transformation during industrial attachment on holistic TVET certificate graduates in Kampala Metropolitan, Uganda

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ABSTRACT

Attitudinal and professional transformation, including work ethic, professional identity, career goal clarity, self-confidence, responsibility, accountability, respect for authority, and employment transition readiness, represents a critical but under-researched outcome of industrial attachment in TVET. This study examined the effect of attitudinal and professional transformation during industrial attachment on holistic TVET certificate graduates in Kampala Metropolitan, Uganda. A convergent parallel mixed-methods design was employed, collecting quantitative data from 375 graduates and qualitative data from 10 key informants. The findings revealed that industrial attachment significantly improved work ethic, professional identity, career goal clarity, self-confidence, responsibility, accountability, respect for authority, and employment transition readiness. Responsibility and accountability showed the highest consistency, while employment transition readiness showed the strongest agreement. Correlation analysis revealed a strong positive relationship between attitudinal transformation and holistic graduate outcomes ($r=0.715$, $p<0.001$), with regression analysis showing that attitudinal transformation explains 51.1% of the variance in holistic graduate outcomes ($R^2=0.511$), the highest explanatory power among all predictors. Qualitative findings confirmed that work ethic improves through exposure to real workplace expectations, professional identity develops as trainees adopt professional titles, and employment transition readiness makes trainees eager to seek work immediately after attachment. The study concludes that industrial attachment is a powerful mechanism for attitudinal and professional transformation. It recommends establishing professional identity development programmes, implementing a national Career Pathway Framework, and developing individual accountability assessment standards.

Key Words: Attitudinal Transformation, Holistic Graduate Outcomes, Industrial Attachment, Professional Transformation, Uganda.

I. INTRODUCTION

Technical and Vocational Education and Training (TVET) is central to equipping learners with practical skills for employment in Uganda (Barigye, 2024). However, employers increasingly emphasize that technical competence alone is insufficient for workplace success. Graduates must also demonstrate positive work attitudes, professional identity, self-confidence, responsibility, accountability, respect for authority, and readiness for employment transition (Niyomushobozi & Kiarie, 2024). These attitudinal and professional attributes determine whether graduates thrive in workplace settings, yet they are rarely taught explicitly in classroom environments and develop primarily through authentic workplace exposure during industrial attachment.

Uganda has introduced several reforms aimed at revitalizing the TVET sector, including the Skilling Uganda Strategy and the TVET Policy (2019), which emphasize industrial attachment as a core methodology for producing holistic graduates (Kim, 2021). The TVET Act 2025 further mandates employer representation on governing councils to ensure training alignment with labour market demands (Muhwezi et al., 2025). However, the Industrial Training Act of 1972, the primary legal framework governing industrial attachment, predates contemporary understanding of attitudinal development and fails to address professional transformation explicitly (Mugabirwe et al., 2025). Studies have highlighted persistent gaps in graduate work ethic and employment transition readiness, yet the role of industrial attachment in facilitating attitudinal transformation remains under-researched (Okware & Ngaka, 2017; Mutebi & Ferej, 2023).

Against this backdrop, assessing the contribution of industrial attachment to attitudinal and professional transformation becomes critical. Understanding how work ethic, professional identity, career goal clarity, self-confidence, responsibility, accountability, respect for authority, and employment transition readiness are developed during attachment can provide a clearer picture of both progress and gaps. This study therefore set out to examine the effect of attitudinal and professional transformation during industrial attachment on holistic TVET certificate graduates



in selected institutions in Kampala Metropolitan, Uganda. The findings are expected to inform evidence-based curriculum reforms, strengthen supervisor training programmes, and promote sustainable improvements in graduate employability.

1.1 Research Objective

To establish the effect of attitudinal and professional transformation during industrial attachment on holistic TVET certificate graduates in selected institutions in Kampala Metropolitan, Uganda.

1.3 Research Hypothesis

H₁: Attitudinal and professional transformation during industrial attachment has a significant positive effect on holistic TVET certificate graduates.

II. LITERATURE REVIEW

Empirical evidence shows that work ethic and professional identity are critical for holistic TVET graduate outcomes, yet significant gaps remain in understanding how industrial attachment contributes to their development. In Malaysia, Basah et al. (2025) conducted a systematic review of 42 studies and found that ethical values and professional integrity are recognized as foundational graduate attributes, yet the review does not isolate industrial attachment as the specific mechanism for work ethic development and relies on studies from high-income countries with limited applicability to Sub-Saharan Africa. In Uganda, Muhwezi et al. (2025) found a significant positive relationship between employer involvement and TVET outcomes ($r=0.623$, $p<0.01$), yet the study does not measure specific work ethic outcomes such as diligence or punctuality and relies on general TVET outcome measures. In Tanzania, Kimboka and Mhina (2026) found that employers remain dissatisfied with graduates' punctuality and professionalism, yet the study focuses on employer dissatisfaction without measuring actual attachment experiences or graduate self-perceptions of work ethic development.

Self-efficacy and confidence development through industrial attachment have been examined with positive findings but notable gaps in measurement and causality. In Indonesia, Lestari et al. (2024) surveyed 202 vocational students and found that self-efficacy significantly influences employability skills and career readiness, yet the study does not examine how industrial attachment specifically contributes to confidence building and does not isolate attachment experiences from other factors such as prior self-efficacy or family background. In Malaysia, Basah et al. (2025) reported that industry stakeholders emphasize confidence and adaptability as key employability traits, yet the study does not empirically test how these psychological attributes are developed during attachment experiences or quantify the effect size of attachment on confidence development. In Uganda, the Ministry of Education and Sports (2022) highlighted KOICA-supported initiatives strengthening industry collaboration, yet these interventions are limited in coverage and no evaluation data is provided on confidence outcomes. The Independent (2023; 2024) reports employer reluctance to offer attachment placements due to cost and supervision burdens, yet these reports are journalistic rather than empirical and do not measure attitudinal outcomes.

Responsibility and accountability development through industrial attachment has been studied with evidence showing structured industry engagement plays a key role, yet implementation challenges remain significant. Basah et al. (2025) found that policy frameworks increasingly emphasize responsibility and professional integrity as foundational graduate attributes, yet the review highlights weak integration of these attributes into actual curriculum delivery with no empirical evidence on how attachment contributes to responsibility development. In Ghana, Sarpong-Nyantakyi and Mensah (2025) found that the majority of students value industrial attachment, yet outdated teaching methods and overcrowding reduce opportunities for meaningful responsibility development, and the study relies on student self-reports without triangulation from employers. In Tanzania, Kimboka and Mhina (2026) reported that clear role definitions and supervision strengthen responsibility-taking, yet the study does not quantify the magnitude of responsibility development or identify specific supervision practices that are most effective. These limitations reveal a clear gap concerning Uganda's TVET certificate graduates. The current mixed-method study addressed this gap by examining Uganda's TVET certificate graduates, using mixed methods to quantitatively assess attitudinal transformation across eight dimensions, incorporating perspectives from graduates, institutional leaders, and industrial partners, and performing regression analysis to establish the explanatory power of attitudinal transformation for holistic graduate outcomes.

III. METHODOLOGY

This study employed a convergent parallel mixed-methods design integrating quantitative and qualitative approaches to provide a comprehensive understanding of the relationship between attitudinal and professional



transformation and holistic graduate outcomes (Creswell & Plano Clark, 2018).. Quantitative data were collected through structured questionnaires, while qualitative insights were gathered through key informant interviews with principals and industrial partners. The separate analysis and subsequent triangulation of both data types ensured a holistic and evidence-based understanding of alignment effects within Uganda's TVET context. The study was conducted in the Kampala Metropolitan area, encompassing five purposively selected TVET institutions: Nakawa Vocational Training Institute, Lugogo Vocational Training Institute, Ntinda Vocational Training Institute, St. Joseph's Vocational Training Institute-Kisubi, and Katonga Vocational Training Institute-Mpigi. These institutions were selected because they have well-established industrial attachment programmes, maintain active linkages with industry employers, and have produced multiple cohorts of graduates who have undergone structured industrial attachment between 2021 and 2024.

The target population comprised 5,368 TVET certificate graduates who completed their training between 2021 and 2024 across the five institutions, 5 principals (one from each institution), and 5 industrial partners nominated by each institution. Using Taro Yamane's formula (1967) with a margin of error of 0.05, a sample size of 372 graduates was calculated. Stratified random sampling was employed to select graduates proportionally from each institution and graduation year, ensuring representation across all five institutions and four cohorts. Census sampling was applied to include all 5 principals and all 5 industrial partners due to their specialized roles.

Two research instruments were employed: structured questionnaires for graduates, and interview guides for principals and industrial partners. The structured questionnaire captured quantitative data on attitudinal and professional transformation and holistic graduate outcomes using Likert-scale items (1=Strongly Disagree to 5=Strongly Agree). The interview guides elicited in-depth insights on work ethic improvement, professional identity development, career goal clarification, self-confidence increase, responsibility and accountability, respect for authority, work perception transformation, and employment transition readiness. To ensure validity, all instruments underwent expert review by academic supervisors and a TVET specialist from the Ministry of Education and Sports. Construct validity was confirmed through Exploratory Factor Analysis, with all factor loadings exceeding 0.5 and Kaiser-Meyer-Olkin of .837. Reliability was established through Cronbach's alpha, with all coefficients above 0.70. Quantitative data from questionnaires were analyzed in SPSS v27. Descriptive statistics (frequencies, means, percentages) summarized graduate responses, while inferential techniques including Pearson correlation and regression analysis tested the relationship between institutional knowledge alignment and holistic graduate outcomes. Qualitative data from interviews were transcribed, coded thematically in NVivo v15, and analyzed using both inductive and deductive approaches to capture patterns and contextual insights.

Ethical clearance was obtained from the University of Eldoret Postgraduate Research Committee, the Uganda Christian University Research Ethics Committee (UCUREC), and the Uganda National Council for Science and Technology (UNCST). Official permission was granted by the Permanent Secretary of the Ministry of Education and Sports. All participants provided informed consent, and data were anonymized and handled with strict confidentiality. The study achieved a 98.2% response rate, reflecting high engagement and enhancing the credibility and representativeness of the findings.



IV. FINDINGS & DISCUSSION

4.1 Findings

Table 1 presents the descriptive statistics reflecting graduates' attitudinal and professional transformations resulting from their industrial attachment experiences.

Table 1

Descriptive statistics on attitudinal and professional transformation through industrial attachment

	Statement	SD (%)	D (%)	NS (%)	A (%)	SA (%)	Mean	σ
1	Industrial Attachment significantly improved my work ethic and commitment to performing tasks diligently.	2 (0.5)	2 (0.5)	21 (5.8)	230 (63.0)	110 (30.1)	4.22	.620
2	After Industrial Attachment, I developed a stronger sense of professional identity and pride in my chosen trade.	8 (2.2)	2 (0.5)	16 (4.4)	179 (49.0)	160 (43.8)	4.32	.776
3	Industrial Attachment clarified my career goals and motivated me to pursue further growth in my field.	6 (1.6)	2 (0.5)	15 (4.1)	175 (47.9)	167 (45.8)	4.36	.737
4	My self-confidence increased substantially as a result of successfully completing Industrial Attachment tasks.	2 (0.5)	0 (0)	18 (4.9)	190 (52.1)	155 (42.5)	4.36	.629
5	Industrial Attachment taught me to take responsibility for my actions and accept accountability for work outcomes.	2 (0.5)	0 (0)	8 (2.2)	212 (58.1)	141 (38.6)	4.34	.606
6	I developed greater respect for workplace authority, rules, and organizational culture during Industrial Attachment.	4 (1.1)	0 (0)	10 (2.7)	189 (51.8)	162 (44.4)	4.38	.651
7	Industrial Attachment transformed my perception of work from merely a requirement to a meaningful professional endeavour.	2 (0.5)	0 (0)	38 (10.4)	187 (51.2)	138 (37.8)	4.26	.683
8	After Industrial Attachment, I feel more prepared and eager to transition from being a trainee to a full-time employee.	2 (0.5)	0 (0)	14 (3.8)	148 (40.5)	201 (55.1)	4.50	.627

The results reveal that industrial attachment significantly improved work ethic and commitment, with 93.1% of respondents agreeing or strongly agreeing (Mean=4.22, SD=0.620). The very low combined disagreement of 1.0% and low neutral percentage of 5.8% suggest that work ethic improvement is a near-universal outcome of industrial attachment. Graduates developed a stronger sense of professional identity and pride in their chosen trade (92.8% affirmative, Mean=4.32, SD=0.776), with 43.8% strongly agreeing, indicating that for nearly half of graduates, the identity transformation was substantial.

Industrial attachment clarified career goals and motivated further growth (93.7% affirmative, Mean=4.36, SD=0.737), with 45.8% strongly agreeing, indicating that career goal clarity is a consistently strong outcome of attachment. Self-confidence increased substantially (94.6% affirmative, Mean=4.36, SD=0.629), with complete absence of disagreement and very low neutral percentage of 4.9%, demonstrating that self-confidence increase is a near-universal outcome of successful task completion during attachment.

Industrial attachment taught graduates to take responsibility for their actions and accept accountability for work outcomes (96.7% affirmative, Mean=4.34, SD=0.606), representing the highest affirmative response among all attitudinal items, with complete absence of disagreement and only 2.2% neutral, indicating that responsibility and accountability development is the most universal attitudinal outcome. Graduates developed greater respect for workplace authority, rules, and organizational culture (96.2% affirmative, Mean=4.38, SD=0.651), with complete absence of disagreement and only 2.7% neutral, demonstrating that respect for authority is a near-universal outcome.

Industrial attachment transformed graduates' perception of work from merely a requirement to a meaningful professional endeavour (89.0% affirmative, Mean=4.26, SD=0.683), with 10.4% neutral responses—the highest neutral percentage in this section—indicating that for a notable minority of graduates, the transformation in work perception was either incomplete or not clearly articulated. After industrial attachment, graduates felt more prepared and eager to transition from being a trainee to a full-time employee (95.6% affirmative, Mean=4.50, SD=0.627), with 55.1% strongly agreeing and complete absence of disagreement, demonstrating that employment transition readiness is the strongest outcome of industrial attachment.

**Table 2**

Thematic matrix of key informant perspectives on attitudinal and professional transformation

Theme	Key Finding	Representative Quote	Frequency
Improved Work Ethic and Commitment	Exposure to real workplace expectations, organizational culture, and consequences for non-performance transforms trainee attitudes toward diligence, responsibility, and professionalism.	"The learners are exposed to the real world of work during IA to observe how those who are employed are doing things. That helps them to adapt to the behaviors of the company." (KI2)	10/10
Professional Identity and Pride	Successful completion of attachment tasks and recognition from industry supervisors builds pride in one's trade and desire to be identified as a professional in the field.	"Yes, you find them talking with confidence... They express their personal identity and start calling themselves 'Engineer'." (KI6)	9/10
Career Goal Clarification	Exposure to industry experts, seeing career progression possibilities, and understanding what different qualifications enable trainees to do clarifies career aspirations and motivates further education.	"When they look at these experts they admire to do the way those experts do their things... They see that managers have higher qualifications than they are pursuing, so they want to be like the supervisors they had." (KI8)	10/10
Increased Self-Confidence	Successfully completing real workplace tasks and receiving positive feedback from supervisors builds trainee confidence in their abilities to perform professional work.	"When they master their skills, this motivates them to apply for jobs... They become more confident and most of the time they are retained in the companies they do IA." (KI4)	10/10
Responsibility and Accountability	Individual task assignment, signing for tools, and facing consequences for mistakes teach trainees to take personal responsibility for work outcomes.	"Some tasks during IA are given individually, so in that case the individual takes responsibility for spoilage. That teaches them that when you are given a task as an individual, you don't blame anybody else." (KI5)	10/10
Respect for Authority and Organizational Culture	Strict workplace rules regarding reporting time, dress code, hierarchical reporting, and adherence to procedures instill respect for authority and organizational culture.	"If you are supposed to report at 8:00 a.m and you come at 8:30 a.m you are not allowed to enter. They are entered in the system and clock in the way employees clock in." (KI8)	10/10
Transformation of Work Perception	Seeing work as a source of income, career progression, and personal fulfillment rather than merely a requirement changes trainees' fundamental orientation toward employment.	"When they keep on doing the same work every day repetitively, it becomes part of you... They see that by working they can earn, so they yearn to be in that position." (KI10)	9/10
Readiness for Employment Transition	The combination of skills, confidence, and professional identity development makes trainees eager to seek employment immediately after attachment, with many being retained by their host companies.	"They are very eager, they know that they are now ready for work... even after the first IA, trainees start escaping from the institute looking for jobs." (KI5)	10/10

The qualitative results reveal that key informants unanimously affirmed that industrial attachment drives significant attitudinal and professional transformation across all ten interviews. All ten informants confirmed that work ethic and commitment improve during attachment. KI2 explained that trainees are exposed to the real world of work and observe how employees conduct themselves, which helps them adapt to company behaviours. KI3 added that returning trainees become more responsible, handle equipment with care, and clean up workshops after sessions, demonstrating changed attitudes. This finding strongly corroborates the quantitative result showing 93.1% affirmative response for work ethic improvement. All ten informants confirmed that career goal clarification occurs during attachment. KI5 noted that trainees see that managers have higher qualifications and want to become like the supervisors they observed. KI7 explained that when trainees see experts at work, including their academic qualifications and career histories, they admire and aspire to emulate them. KI2 added that some trainees who chose courses without knowing what they entailed come to understand their chosen fields and, in some cases, regret their initial choices, leading to more informed career decisions. These findings support the quantitative result showing 93.7% affirmative response for career goal clarification.

Regarding self-confidence, all ten informants confirmed substantial increases. KI7 noted that when trainees master their skills, this motivates them to apply for jobs. KI4 reported that graduates become more confident and are



often retained by the companies where they completed attachment. KI2 observed that returning trainees become self-driven and start initiating their own projects rather than waiting for trainer instructions. KI6 reported that building trainees refused to work as porters during attachment because they knew themselves as masons, demonstrating clear professional confidence. These findings strongly support the quantitative result showing 94.6% affirmative response for self-confidence increase.

All ten informants confirmed that responsibility and accountability are developed during attachment. KI10 explained that some tasks are given individually, requiring trainees to take personal responsibility for spoilage rather than blaming others. KI8 noted that signing for tools from the store and ensuring their return teaches accountability. KI4 added that trainees take responsibility for mistakes to the extent of replacing damaged or lost items. These findings support the quantitative result showing 96.7% affirmative response for responsibility and accountability—the highest among all attitudinal items. All ten informants confirmed that respect for authority and organizational culture is developed. KI8 noted that workplace rules require reporting by 8:00 a.m., and latecomers are not permitted to enter. KI5 explained that trainees are entered into the clocking system like employees, with the system capturing their arrival and departure times. KI1 observed that trainees learn industry hierarchy, where a foreman reports to someone who reports to another person, and watching this teaches respect for authority. These findings strongly support the quantitative result showing 96.2% affirmative response for respect for authority.

Finally, all ten informants confirmed that trainees feel ready and eager for employment transition after attachment. KI5 stated that second-year trainees seek employment immediately after their second attachment. KI4 noted that even after the first attachment, trainees start seeking jobs. KI8 indicated that about 90% of trainees from each cohort are retained, unless an individual does not wish to stay. These findings strongly support the quantitative result showing 95.6% affirmative response for employment transition readiness, which had the highest mean (4.50) and strongly agree percentage (55.1%) in this section.

Table 3

Pearson correlation between attitudinal and professional transformation and holistic TVET certificate graduates

Correlations		Attitudinal and Professional	Holistic TVET certificate graduates
Attitudinal and Professional	Pearson Correlation	1	.715**
	Sig. (2-tailed)		.000
	N	365	365
Holistic TVET certificate graduates	Pearson Correlation	.715**	1
	Sig. (2-tailed)	.000	
	N	365	365

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis in Table 6.3 revealed a strong, positive, and statistically significant correlation between attitudinal and professional transformation and holistic graduate outcomes, with a correlation coefficient of $r=0.715$ ($p<0.001$). This indicates that as graduates' attitudinal and professional transformation through industrial attachment increases, their holistic outcomes also increase in a consistent and predictable manner. The significance level ($p<0.001$) falls well below the conventional threshold of 0.05, providing strong evidence against the null hypothesis. Therefore, the null hypothesis is rejected, and it is concluded that attitudinal and professional transformation has a significant positive effect on holistic graduate outcomes among TVET certificate graduates in Kampala Metropolitan. These findings support the theoretical proposition that improved work ethic, professional identity, career goal clarity, self-confidence, responsibility, respect for authority, and employment transition readiness enhance graduates' professional maturity and workplace integration.

**Table 4**

Regression Analysis of Attitudinal and Professional Transformation During Industrial Attachment and Holistic TVET Certificate Graduates

Coefficients ^a					
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.018	.169		6.032	.000
Attitudinal and professional transformation during IA	.753	.039	.715	19.474	.000
a. Dependent Variable: Holistic TVET certificate graduates					
R	R Square	Adjusted R Square	Std. Error	F Statistic	Sig.
.715 ^a	.511	.510	.34663	379.232	.000 ^b

The regression analysis results in Table 6.4 indicate a statistically significant positive relationship between attitudinal and professional transformation during industrial attachment and holistic TVET certificate graduates. The R Square value of 0.511 shows that attitudinal and professional transformation accounts for 51.1% of the variance in holistic graduate outcomes, which is the highest explanatory power among all predictors in this study, demonstrating that changes in mindset, identity, and professional orientation are central to graduate success. The overall model is statistically significant, as reflected by the F-statistic of 379.232 with a p-value of 0.000, confirming that attitudinal and professional transformation is a reliable predictor of holistic graduate outcomes.

The unstandardized coefficient ($B=0.753$) suggests that for every one-unit increase in attitudinal and professional transformation, holistic graduate outcomes increase by 0.753 units, representing the strongest effect among all predictors. The standardized Beta coefficient ($\beta=0.715$) indicates a strong effect size, reinforcing the importance of improved work ethic, professional identity, career goal clarity, self-confidence, responsibility, accountability, respect for authority, and employment transition readiness developed during attachment. The t-value of 19.474 with a significance level of $p<0.001$ further validates the strength of this relationship. These results highlight that beyond technical skills and even soft skills, the fundamental transformation of how trainees view themselves as professionals and perceive the meaning and purpose of work is the most powerful predictor of holistic graduate outcomes. However, with an R Square of 0.511, it is evident that 48.9% of the variance in holistic graduate outcomes is explained by other factors beyond attitudinal and professional transformation, such as attachment duration and intensity, quality of role models encountered in industry, degree of responsibility entrusted, alignment between career aspirations and attachment tasks, and post-attachment institutional support.

4.2 Discussion

The finding that industrial attachment instils a strong work ethic demonstrates that exposure to real workplace expectations transforms trainee attitudes toward diligence and professionalism. This finding aligns with Basah, Mohd Noor, and Ahmad (2025), who found that policy frameworks increasingly emphasize ethical values as foundational graduate attributes, and extends their work by demonstrating that attachment fills the implementation gap through authentic accountability experiences. The current study refines the findings of Muhwezi, Ferej, and Kiplagat (2025) by demonstrating that even when employer participation is uneven, exposure to workplace expectations produces meaningful work ethic improvement. This contradicts concerns raised by The Independent (2023; 2024) that employer reluctance reduces meaningful exposure, suggesting that quality of exposure matters more than duration. The qualitative finding that trainees become more responsible and handle equipment with care illustrates how attachment transforms observable behaviors. Practically, institutions should strengthen pre-attachment orientation on workplace professionalism, as noted by Okware and Ngaka (2017).

The finding that successful completion of attachment tasks builds pride in one's trade demonstrates that professional identity development occurs through authentic participation in professional communities. This finding aligns with Basah et al. (2025), who found that industry stakeholders consistently emphasize professional identity as a key employability trait, and extends the work of Lukitasari and Suhartini (2025) by demonstrating that professional identity is a key outcome of industry collaboration. The qualitative finding that trainees express their professional identity by calling themselves "Engineer" after attachment illustrates how fundamentally their self-perception transforms. This finding also supports the work of Muhwezi, Ferej, and Kiplagat (2025), who reported that employer involvement strengthens training relevance, as professional identity emerges when trainees see themselves reflected in the workplace. Practically, institutions should facilitate opportunities for returning trainees to share their professional identity transformation with pre-attachment cohorts, as suggested by Mutebi and Ferej (2023).



The finding that industrial attachment clarifies career goals and motivates further growth demonstrates that exposure to industry experts shapes career aspirations. This finding aligns with Lestari et al. (2024), who found that self-efficacy significantly influences career readiness, with career goal clarity representing a key mechanism. The current study extends these findings by demonstrating that career clarification occurs through direct observation of role models and understanding of qualification pathways, with trainees seeing managers with higher qualifications and wanting to emulate the supervisors they observed. This finding also addresses concerns raised by Kimboka and Mhina (2026) in Tanzania regarding poorly structured placements, as the current study demonstrates that well-structured attachment with exposure to career progression possibilities produces strong career clarity outcomes. Practically, institutions should invite industry professionals to share career pathway information during pre-attachment orientation, positioning attachment as career exploration that helps trainees make informed decisions about further education, as recommended by the Ministry of Education and Sports (2022).

The finding that responsibility and accountability development is the most universal attitudinal outcome demonstrates that individual task assignment, signing for tools, and facing real consequences for mistakes teach personal responsibility in ways that shared classroom responsibilities cannot replicate. This finding aligns with Basah et al. (2025), who found that policy frameworks emphasize responsibility as a foundational graduate attribute, and extends the work of Sarpong-Nyantakyi and Mensah (2025) in Ghana by demonstrating that attachment, when properly structured, overcomes the overcrowding and limited industry exposure that typically reduce responsibility development opportunities. The qualitative finding that signing for tools and ensuring their return teaches accountability, and that trainees replace damaged items, illustrates how consequences in workplace settings differ fundamentally from classroom settings, as noted by Kimboka and Mhina (2026). Practically, institutions should prepare trainees for individual accountability through project-based assessments with clear individual contributions, and host companies should provide trainees with clearly defined individual tasks rather than always assigning them to teams, as recommended by Mutebi and Ferej (2023) and Okware and Ngaka (2017).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Industrial attachment instils a strong work ethic by exposing trainees to real workplace expectations, organizational culture, and the tangible consequences of non-performance. Trainees observe how employees conduct themselves, adapt to company behaviours, and internalize professional standards of conduct that are difficult to teach in classroom settings. Returning trainees demonstrate changed attitudes through increased responsibility, careful handling of equipment, and voluntary workshop cleaning. Work ethic improvement is a near-universal outcome of industrial attachment, with very low disagreement and neutral responses. Successful completion of attachment tasks and recognition from industry supervisors builds pride in one's trade and transforms how trainees perceive themselves within their professional community. Trainees develop a sense of belonging to their chosen field, with many expressing their professional identity by calling themselves by their trade titles such as "Engineer" after attachment. This identity transformation is substantial for many trainees, with nearly half strongly agreeing that their professional identity strengthened.

Industrial attachment shifts trainees' fundamental orientation toward work, transforming it from something they must do to something they choose and value as part of their professional identity. This transformation occurs through sustained exposure to both extrinsic rewards such as income and intrinsic rewards such as accomplishment and recognition. The combination of skills, confidence, and professional identity development makes trainees eager to seek employment immediately after attachment, with many being retained by their host companies. Employment transition readiness is the strongest outcome of industrial attachment, with the highest mean and strongly agree percentage, reflecting the ultimate goal of TVET to prepare graduates psychologically and practically for the school-to-work transition.

5.2 Recommendations

TVET institutions should establish a Professional Identity Development Programme that explicitly fosters pride and belonging in chosen trades through pre-attachment orientation, during-attachment recognition, and post-attachment celebration of achievements. This programme should include industry professional guest speakers, trade-specific symbols and language (such as calling trainees by their trade titles), and formal recognition events where returning trainees share their attachment successes. Institutions should also establish alumni mentorship schemes where former trainees who have secured employment in their trades serve as role models for current students. The Ministry of Education and Sports should develop and disseminate a national Career Pathway Framework that clearly articulates progression routes from certificate through diploma to degree levels, linking each level to specific employment outcomes, salary expectations, and advancement opportunities in each trade. This framework should be integrated into



pre-attachment orientation and should include profiles of professionals who have successfully advanced through the TVET pathway, serving as tangible role models. Institutions should use this framework to advise trainees on further education opportunities identified through attachment experiences.

The Uganda Vocational and Technical Examinations Board (UVTAB) should revise industrial attachment assessment standards to include explicit evaluation of individual task completion, tool accountability, and responsibility for work outcomes, moving beyond logbook verification to direct assessment of accountability behaviours. Assessment instruments should include supervisor ratings on dimensions such as task ownership, error reporting, tool care, and follow-through on assigned responsibilities. Institutions should incorporate individual accountability training into pre-attachment preparation, including simulated scenarios requiring tool sign-out, task documentation, and error reporting.

TVET institutions should develop a comprehensive workplace culture orientation module that prepares trainees for hierarchical reporting structures, punctuality requirements, dress codes, and organizational norms they will encounter during attachment. This module should include specific examples of workplace rules from partner industries, explanations of the consequences for non-compliance, and strategies for respectfully raising concerns within hierarchical structures. Institutions should maintain consistent expectations regarding punctuality, attendance, and professional conduct that mirror workplace standards, ensuring trainees experience continuity between institutional and workplace cultures. The Ministry of Education and Sports should establish a national Employment Transition Tracking System that monitors graduate employment outcomes, retention rates with attachment host companies, and time-to-employment following programme completion. This system should provide data to inform institutional performance assessment, identify high-performing employers for recognition and replication, and guide policy decisions regarding attachment duration and structure. Institutions should use this data to strengthen post-attachment career support services, including job placement assistance, interview preparation, and connections to further education opportunities identified during attachment.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

- Barigye, D. (2024). Technical vocational education and training in Uganda: Career guidance and practices. *African Journal of Career Development*, 6(1), a100. <https://doi.org/10.4102/ajcd.v6i1.100>
- Basah, N. A. S. H., Mohd Noor, M. A., & Ahmad, A. M. (2025). Graduate attributes and employability skills in TVET in Malaysia: A systematic review towards holistic and future-ready graduates. *Management Research Journal*, 14(2). <https://doi.org/10.37134/mrj.vol14.2.6.2025>
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.
- Jahonga, W. M. (2020). *Effectiveness of supervised industrial attachment programme in technical and vocational education training (TVET) institutions in the North Rift Region, Kenya* [Doctoral dissertation, Moi University].
- Kim, J. (2021). An analysis of Uganda's vocational education: Assessing human capital and human development approaches. *Issues in Educational Research*, 31(2), 556–573.
- Kimboka, N., & Mhina, J. A. (2026). Bridging the employability gap in Tanzania's TVET system. *Tanzania Journal of Community Development*, 5(1). <https://doi.org/10.4314/tajocode.v5i1.1>
- Lestari, Y. K., Agung, A. I., Buditjahjanto, I. G. P. A., Anifah, L., Wrahatnolo, T., Isnur, S., & Wanarti, P. (2024). Tackling the future: Optimizing TVET students of employability skills through self-regulated learning and self-efficacy. *Ekuitas: Jurnal Pendidikan Ekonomi*, 12(1), 1–12. <https://doi.org/10.23887/ekuitas.v12i1.77092>
- Lukitasari, F., & Suhartini, R. (2025). Employability skill in vocational education: A literature review on innovation and industry collaboration. *International Seminar*, 7, 507–518. <https://doi.org/10.36563/vkb80b56>
- Ministry of Education and Sports, Uganda. (2022). *Capacity building for industry demand-based technical and vocational education and training in Uganda*. Government of Uganda.
- Mugabirwe, O., Mugabe, R., & Muhumuza, B. (2025). Creative pathways to employment: Examining the role of skills development in vocational graduates' innovation-employability trajectory. *East African Journal of Education Studies*, 8(2), 1171–1186. <https://doi.org/10.37284/eajes.8.2.3358>



- Muhwezi, L. K. A., Ferej, A., & Kiplagat, H. (2025). Assessing industry employer involvement in enhancing quality of training in Ugandan TVET colleges. *Asian Journal of Education and Social Studies*, 51(10), 416–427. <https://doi.org/10.9734/ajess/2025/v51i102503>
- Mutebi, R., & Ferej, A. (2023). A review of TVET quality assurance practice in Uganda. *East African Journal of Interdisciplinary Studies*, 6(1), 182–196. <https://doi.org/10.37284/eajis.6.1.1327>
- Niyomushobozi, A., & Kiarie, M. N. (2024). Trainers' continuous professional development and students' learning outcomes in TVET institutions. *International Journal of Advanced Research*, 12(10), 526–530. <https://doi.org/10.21474/IJAR01/19669>
- Okware, J. C., & Ngaka, W. (2017). Rationale and challenges of technical vocational education and training in Uganda. In *Technical education and vocational training in developing nations* (pp. 26–44). IGI Global. <https://doi.org/10.4018/978-1-5225-1811-2.ch002>
- Sarpong-Nyantakyi, J., & Mensah, R. O. (2025). Industrial attachment programme as a panacea for graduate unemployment: A case of Higher National Diploma graphic design students at the Takoradi Technical University, Ghana. *African Quarterly Social Science Review*, 2(2), 55–72. <https://doi.org/10.51867/AQSSR.2.2.6>
- The Independent. (2023, October 16). UBTEB, engineers' institute concerned over limited TVET trainees attachment opportunities. *The Independent Uganda*.
- The Independent. (2024, March 27). UBTEB decries reluctance to provide internship opportunities to trainees. *The Independent Uganda*.
- Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper and Row.