

# Exploring skills acquisition differences in leather work among technical university students in Ghana: The case of Tamale Technical University

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**Citation:** Seini, I.M., Essel, H.B., & Tachie-Menson, A. (2024). Exploring skills acquisition differences in leather work among technical University Students in Ghana: The case of Tamale Technical University. *Research and Development in Education (RaDEn)*, 4(2), 1529-1538.  
<https://doi.org/10.22219/raden.v4i2.36727>.

Received: 10 October 2024  
Revised: 13 November 2024  
Accepted: 8 December 2024  
Published: 31 December 2024



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**Abstract:** This research examines gender-based differences in skills acquisition among students, with a particular emphasis on Creativity. Utilizing an independent sample t-test, the study evaluated the development of creative skills among male and female students in Leatherwork, specifically focusing on Decorative Techniques and Thonging Techniques. The data were derived from a cohort of students enrolled in Leatherwork training from level 100 to level 300 of the Higher National Diploma (HND) program at the Tamale Technical University. The analysis aimed to determine whether significant differences exist in the way male and female students acquire Creative Skills in Leatherwork. Factors such as instructional methods and gender-specific learning preferences were explored. The results of the independent sampled t-test indicated that there were no notable disparities in creativity scores between male and female students within the pedagogical framework adopted. The findings further suggested that there were no significant differences in skill acquisition in Leatherwork between males and females. The study demonstrates that the pedagogical framework accommodates the skills development and acquisition of both genders, highlighting the need for educational strategies that address these differences and promote the development of creativity equally among all students, irrespective of gender. Implications for curriculum design and gender-sensitive pedagogy were discussed to foster more equitable learning outcomes.

**Keywords:** gender; leatherwork; pedagogy; skills acquisition; technical university

## 1. Introduction

Technical universities in Ghana typically articulate a mission that emphasizes the integration of theoretical knowledge and practical skills, thereby preparing students to navigate the demands of the labour market adeptly. The fundamental objectives often include a steadfast commitment to the advancement of research and innovation, as well as a focused dedication to national development through technological advancements.

In 1999, during the Second International Congress on Technical and Vocational Education in Seoul and UNESCO's 30th General Conference in Paris, the term "Technical and Vocational Education and Training" (TVET) was formally adopted to represent the combined process of education and training aimed at immediate employment (Leedy et al., 2010). The congress highlighted the importance of treating TVET as a multidisciplinary issue, requiring collaborative and integrated approaches (Akala & Changilwa, 2018). It was also stressed that TVET programs should be designed as inclusive systems, addressing the needs of all learners and ensuring accessibility for everyone. Special attention was called to the importance of engaging marginalized groups and developing programs that help them enter the mainstream workforce (Lyngdoh, 2005).

Nearly a decade after the events in Seoul and Dakar, a new opportunity has arisen, shaped by a shifting global context, to redirect attention toward Technical and Vocational Education and Training (TVET) and skills development. This renewed focus is reflected in

both national priorities and the evolving agendas of development agencies (Marope et al., 2015). The momentum supporting skills policies and strategies is driven by several critical factors. First, the achievements of the past decade in promoting universal primary education have created political pressure to broaden access to both general and technical secondary education. Second, there is an increasing acknowledgment that high-quality skills are vital for enhancing labor market productivity and competitiveness (Nwakanma & Uchechukwu, 2019).

TVET programs must ensure gender balance by encouraging men to enter fields traditionally dominated by women, and women to pursue careers in male-dominated sectors. Technical and Vocational Education and Training (TVET) is a vital part of lifelong learning, contributing significantly to understanding the broader context of technical and vocational education. It supports both individual and national efforts toward fostering a culture of peace, promoting environmentally sustainable development, strengthening social cohesion, and encouraging international citizenship (Emmanuel et al., 2014).

The current demand for skills that integrate technical expertise with often overlooked attributes such as flexibility, adaptability, and communication is increasing (Markowitsch & Hefler, 2019). To improve women's employment opportunities and facilitate their entry into male-dominated fields, it is imperative to enhance their training in these areas. Curriculum designers in Technical and Vocational Education and Training (TVET) should introduce incentives to encourage women to enroll in TVET programs at Technical Universities (Diwakar & Ahamad, 2015; Hiebert et al., 2003). Moreover, training initiatives must align with labor market demands, and systems should be established to identify and address skill gaps among women. Additionally, the establishment of a gender-sensitive labor market observatory is recommended to ensure that the TVET system effectively meets the workforce needs of both men and women.

It is unclear what creativity factors are critical to students' leatherwork skills acquisition in the technical universities of Ghana. It is equally important to examine the gender disparities in skills acquisition among leatherwork students to provide pedagogical interventions supported by empirical evidence. In view of these, this study is guided by the following questions: (i) Are there gender disparities in leatherwork skills acquisition among students of Technical Universities in Ghana?; and (ii) What are the critical creativity factors regarding Skills Acquisition among students of Technical Universities in Ghana?

Technical vocational education and training (TVET) aims to provide individuals with essential skills and build competencies in science, technology, engineering, and mathematics (Esquivel & Sweetman, 2016). As the country strives to achieve the goals of Vision 2030 and the Sustainable Development Goals (SDGs), ensuring gender equality is essential. Women and girls must have the same access as men and boys to quality education, economic resources, and political engagement, as well as equal opportunities for employment, leadership, and decision-making at all levels (Giri Scholar, 2021). The skills gained through vocational training are vital for preparing students for future job markets, whether in formal or informal sectors (Brewer, 2013).

Andiema and Manasi (2021) posits that TVET embodies a comprehensive and inclusive framework aimed at facilitating individuals in realizing their full educational and vocational potential. This, in turn, enables them to make significant contributions to their respective communities. When contemplating the implementation, maintenance, or expansion of technical and vocational education opportunities, it is essential to address several fundamental issues and challenges that may arise (Nwakanma & Uchechukwu, 2019).

The concept of skills acquisition has gained considerable importance because of its essential role in the socio-economic advancement of society. Economically, skills acquisition stimulates markets and acts as a strong tool for offering alternative job opportunities to unemployed graduates and young people by promoting the creation of

small and medium-sized businesses (Emmanuel et al., 2014). Socially, it empowers individuals, encourages innovation, and promotes changes in public attitudes. Skills acquisition refers to the process by which people gain or improve new skills and competencies (Diwakar & Ahamad, 2015). It plays a vital role in both personal and professional growth, allowing individuals to learn new tasks, overcome challenges, and increase their effectiveness in various activities (Nilsson, 2010).

Globally, it is clear that gender influences educational outcomes. In some societies, including modern-day Ghana, particularly in the Northern Regions, early marriages for girls are common, which affects their school enrollment and completion. Consequently, this leads to lower educational achievements for girls compared to boys (Brewer, 2013; Leal Filho et al., 2023). The gender gap has attracted considerable attention from multiple sectors. Parents are concerned about their daughters' personal development and their ability to compete for and thrive in emerging, well-paid TVET and STEM careers, including fields like leatherwork. Local educators are dedicated to offering equitable education, while national government agencies are focused on ensuring a sufficient talent pool to meet workforce needs and promote self-employment (Arfo, 2015; Pankratova et al., 2024).

Skills acquisition serves as a crucial pathway for women's empowerment, a goal that is underscored in the development policies of numerous nations. This approach is grounded in the conviction that poverty alleviation necessitates the inclusion of all individuals in developmental initiatives (Chukwuedo & Omofonmwan, 2015; Obadara & Oyebolu, 2013). Consequently, skills acquisition emerges as a pivotal strategy in realizing this objective, with women assuming a central role. By empowering both genders, skills acquisition equips citizens with the essential skill sets required for various industries, such as leatherwork (Dasmani, 2011; Onyenwe, 2012).

Research increasingly indicates a significant relationship between development effectiveness and empowerment. Empowerment strategies facilitate inclusive economic growth through investments in sectors such as education, which enhance individuals' capabilities and access to opportunities. Economic empowerment programs frequently emphasize the role of women, attributed to their reliability, persistence, trustworthiness, and commitment to collective well-being over individual gain. Education, in particular, has historically been recognized as a fundamental instrument for economic development, as it cultivates personal assets that positively influence women's participation in the workforce (Emmanuel et al., 2014).

Skill development for employability will act as a catalyst for enhancing women's employment opportunities. Women face numerous barriers to accessing skills training and securing productive employment, as well as maintaining their positions in the face of globalization and other challenges, and advancing to higher-level roles. Additionally, they encounter difficulties in re-entering the labour market following periods of absence, such as those associated with child-rearing (Barinua et al., 2022; Giri Scholar, 2021b).

Gender-focused skills acquisition has significant implications for both individuals and society at large. Equipping both men and women with the requisite skills for employability, particularly in sectors traditionally dominated by one gender, promotes economic empowerment and mitigates gender inequality (Diwakar & Ahamad, 2015). Women, in particular, derive substantial benefits from targeted skills training, which facilitates their access to enhanced employment opportunities, entry into male-dominated fields, and attainment of higher-level positions. This advancement not only improves their financial independence but also contributes to the overall economic stability of families and communities (Nwakanma & Uchechukwu, 2019). Furthermore, skills acquisition fosters greater social inclusion, particularly for marginalized groups, by providing them with the necessary tools to surmount barriers to employment and economic participation (Nilsson, 2010).

The emphasis on gender in skills development significantly enhances workforce productivity, as both men and women are better equipped to address the demands of a rapidly evolving labour market. This, in turn, fosters innovation and growth within various industries, additionally, by encouraging individuals of both genders to pursue careers in fields traditionally associated with the opposite gender, skills acquisition challenges and dismantles entrenched stereotypes, thereby promoting a cultural shift towards gender equality (Mvunabandi et al., 2023; Nwakanma & Uchechukwu, 2019). This process aligns with sustainable development goals by facilitating inclusive growth, reducing poverty, and strengthening social cohesion (Acheampong, 2014; Nilsson, 2010). Furthermore, education and skill-building empower individuals, particularly women, by augmenting their decision-making capabilities and self-sufficiency, which contributes to enhanced gender equity in both private and public domains. Ultimately, gender-sensitive skills acquisition not only propels economic advancement but also catalyzes social transformation toward a more inclusive and equitable society. The objectives of the Study: (1) To analyze Gender Disparities in Leatherwork Skills Acquisition; and (2) To identify the critical factor in creativity of concern to students.

## 2. Materials and Methods

This study gathered data from technical university students on creativity in skills acquisition and gender differences in skill development. The focus was on students in the Art and Design Innovation Department at Tamale Technical University in Tamale, Ghana. The research aimed to identify key concerns related to creativity and skills acquisition among students. Additionally, after the intervention, the study aimed to explore gender differences in skills acquisition.

The target population for the study was students in the faculty of Creative Art and Technology from level 100 to level 300 of student in the on the Higher National Diploma students in the Department of Art and design Innovation. Simple random sampling, and purposive sampling techniques were use in the study. Simple random sampling was used to select students on the HND programme in level 100, level 200 and level 300 for the study. Purposive sampling was used in selecting the students offering Leatherwork Department of Art and Design Innovation in Tamale Technical University. This was because the study was focused on the critical issues of concern to students on Leatherwork.

A four-point Likert-type scale questionnaire was developed on creativity with 11 items covering the critical areas of concern on Skills Acquisition. The questionnaire was pretested in the department of Fashion Technology in Faculty of Creative Art in Tamale Technical University to determine the overall reliability of the research instrument using Cronbach's alpha to ascertain the internal consistency which yielded a reliability index of .87 as presented in Table 1. The questionnaires were administered by the researchers who spent about three weeks on the field after seeking permission from gate keepers and explaining the purpose of the study. Seventy (65) questionnaires were administered and a total of 61 retrieved representing 93% recovery rate. Data were analysed using IBM's SPSS v23. Descriptive statistics such as frequencies, means and standard deviations were used to analyse and rank the Creativity item responses on Skills Acquisition according to the means to determine students' perception of critical factors on Creativity. An independent sampled t-test was conducted to ascertain the critical areas of concern.

Table 1. Reliability statistics on students' creativity

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
.78	.79	11

### 3. Results

#### 3.1. Differences in Skills Acquisition of Students by Gender

An independent samples t-test was performed to evaluate whether there was a difference between the skills acquisition of males and females after the intervention. The results indicated that there was no significant difference in skills acquisition between the males ( $M = 197.3469$ ,  $SD = 12.08227$ ) and females ( $M = 202.3636$ ,  $SD = 8.55889$ ),  $t(-1.302) = -1.616$ ,  $p = .198$ . These results suggest that gender really does not influence skills acquisition in leatherwork even though the difference was higher among females than males. The results of the analysis is presented in [Table 2](#).

**Table 2.** Difference Between Males and Females in Skills Acquisition

Item	Gender	n	SD	df	t	Sig(2-tailed)
Skills acquisition Post Intervention	Male	49	12.082	58	-1.30	.198
	Female	11	8.56			
	Equal variances assumed		27			
	Equal variances not assumed			20.11	-1.62	.122

The results from [Table 2](#) suggests that there is no statistically significant disparity in skill acquisition between male and female students. This appear to imply that gender does not exert a crucial influence on skills acquisition in this context. Despite the data displaying a slight advantage for female students, this discrepancy is not significant to indicate any inherent advantage or disadvantage for either gender. The analysis reveals that male and female students in this sample demonstrate similar levels of skill acquisition, and the observed differences in average scores lack statistical significance. Hence, it can be inferred that gender-based disparities in skill acquisition is not significant among students of leatherwork in the Technical Universities of Ghana.

#### 3.2. Findings on Critical Factors of Students Creative Skills

The augmentation of creativity skills correlates with research that underscores the significance of hands-on, experiential education in enriching creative capacities, particularly within the technical and vocational realm. Provide evidence of this phenomenon, as they discovered that project-based learning, which promotes experimentation and innovation, yielded enhancements in creativity. Demonstrated that systematically designed interventions intended to cultivate imaginative cognition could yield substantial improvements in students' creative output.

The findings of this study are consistent with prior research conducted by [Bereczki, and Karpati, \(2018\)](#), demonstrating that creativity in technical domains such as leatherwork encompasses not only artistic expression but also problem-solving and innovative thinking. It is highly probable that the intervention equipped students with the necessary resources and opportunities to engage in enhanced creative thinking, thereby resulting in the observed improvement in their creativity scores.

However, the present study presents a contrasting viewpoint to the research conducted by [Miller et al \(2022\)](#) asserting that the task of fostering creativity through structured interventions within a limited timeframe is arduous. The outcomes of the current study propose the feasibility of cultivating creativity within a relatively brief duration, potentially using an approach that incorporates creativity into pragmatic, skill-oriented activities.

A practical implication pertains to the enhancement of students' learning experience through the incorporation of creativity within the instruction of technical skills. Creativity assumes a decisive role within disciplines such as leatherwork, as the ability to innovate and think beyond conventional boundaries can result in distinctive outcomes. By

cultivating creativity, educators have the potential to more effectively equip students for the requirements of the contemporary labour market, which places great emphasis on creative problem-solving.

This study makes a significant academic contribution to the expanding corpus of literature that emphasizes the paramount role of creativity within the sphere of technical education. It compellingly demonstrates the efficacy of implementing focused interventions to effectively foster and cultivate creativity, even within domains that are predominantly skill-centric, such as leatherwork.

In conclusion, the intervention yielded a significant improvement in students' creativity skills within the domain of decorative and thonging techniques in the field of leatherwork. These findings underscore the importance of incorporating creativity within technical education and indicate that carefully crafted interventions can exert a profound influence on students' creative capacities.

### *3.3. Findings on Differences of Gender in Skills Acquisition*

An independent sample t-test was conducted after the intervention, this was to assess whether there was a significant difference in skills acquisition based on gender. The result indicates no statistically significant difference between genders, implying that gender may do not influence skills acquisition in leatherwork and therefore not a decisive factor in determining students' skills acquisition in leatherwork. These findings align with [Marope et al., \(2015\)](#) assert that there is a tendency to exaggerate gender disparities in performance and when such disparities do occur, they are often contingent upon specific contexts rather than universally applicable. [Seremba, \(2022\)](#) emphasizes that in numerous skill-oriented disciplines, such as technical and vocational education, the discrepancies in achievement between males and females tend to diminish when equitable opportunities and access to resources are afforded.

Similarly, [Ackerman et al., \(2001\)](#) "Gender Similarities Hypothesis" posits that males and females exhibit more similarities than differences in various psychological traits and abilities, including those about education and skill acquisition. The findings of the present study provide support for this hypothesis, as the statistical analysis revealed no statistically significant disparity in the acquisition of leatherwork skills between male and female students.

However, these findings also challenge the conclusions drawn from previous studies that have highlighted pronounced gender disparities in the acquisition of skills, particularly in areas traditionally associated with one gender. [Wang et al., \(2017\)](#) for instance, discovered that males frequently exhibit superior performance in technical and vocational fields. They attribute this pattern to socialization processes that encourage males to pursue and excel in these domains. Conversely, other investigations, such as the one conducted by [Wynn & Correll, \(2017\)](#) have demonstrated that females tend to surpass males in academic contexts, including skill-based assessments. This phenomenon is thought to be a result of higher levels of self-discipline and motivation observed among females. The contradiction between these prior findings and the present study's results implies that gender differences in skills acquisition are multifaceted and can be influenced by various contextual factors, such as the specific subject matter, cultural expectations, and the pedagogical approaches employed.

The absence of a statistically significant disparity in skills acquisition among male and female students in this study carries significant implications for the realm of leatherwork education. First and foremost, it serves as a direct challenge to long-standing gender stereotypes that frequently purport the notion of males being better suited to technical and vocational disciplines, such as leatherwork. The data presented herein clearly indicates that, given proper instruction and sufficient resources, both male and female students possess the capacity to achieve comparable levels of proficiency in this hands-on craft. Consequently, this finding lends support to the argument in favour of a more inclusive

vocational education approach, one that actively promotes participation from individuals of all genders and abstains from perpetuating antiquated gender norms.

#### 4. Discussion

Sixty one (67) respondents were involved in the study. This was made up of level 100, level 200 and level 300 students of the Department of Art and Design Innovation in Tamale Technical University. However, 6 of the questionnaires could not be retrieved. The analysis and discussions were based on the data provided by these 61 respondents. Data background indicated more level 100 students than level 200 and level 300. It was evident from the data that majority (74.2%) of the respondents were male and with few females (25.8%). In summary, the background information revealed that the student enrolment for the Leatherwork programme appear to create a gender disparity in number of students suggesting the need for attention.

##### 4.1 Analysis of Critical Factors in the Creative Skills of Students

The data in [Table 3](#) presents the survey results that explored students' engagement in leather crafting, as indicated by their responses to a series of statements. These responses were measured using a Likert type scale, with options ranging from Strongly Disagree (SD) to Strongly Agree (SA), and were accompanied by corresponding percentages. Additionally, the table includes the mean and standard deviation (Std. D) for each statement, offering insights into the responses' central tendency and variability.

**Table 3.** Critical Factors In the Creative Skills of Students

Statement	Mean	Std.D	Rank
I develop my decorative/ thonging designs using various ideas	4.54	.62	1
Gathering the best possible decorative and thonging techniques for my leather articles	4.49	.57	2
Integrating other non-leather materials in decorative and thonging techniques	4.46	.57	3
Analysing the task at hand to make a good leather artefact	4.44	.65	4
Coming up with my interpretation of the leather artefacts I produce	4.41	.59	5
Carry out or design a specific experiment in the studio	4.39	.53	6
Coming up with new ways to think about an old leather artefact	4.38	.61	7
Responding to an idea on leather decorative/thonging in a context appropriate way to enhance artefact aesthetics	4.38	.82	8
Researching ideas using many different types of sources that may not be readily apparent	4.33	.75	9
Draw a series of thumbnail sketches for a task at hand	4.33	.72	10
Crafting new works in reference to already existing ones	4.25	.79	11

[Table 3](#) provides analysis of skills associated with design and creativity in leatherwork, with each statement evaluated based on its mean score and standard deviation. The statement with the highest ranking, "I develop my decorative/thonging designs using various ideas," exhibits a mean score of 4.54 and a low standard deviation of 0.62, suggesting a strong consensus among participants regarding the use of diverse ideas in their design process. The minimal variability indicates that the majority of respondents place a high priority on the development of innovative designs as part of their creative endeavors. In a similar vein, the statement "Gathering the best possible decorative and thonging techniques for my leather articles" ranks second, with a mean score of 4.49 and a lower standard deviation of 0.566, underscoring a shared recognition of the significance of employing optimal techniques in the practice of leatherwork.

The integration of materials significantly influences leatherwork design, as evidenced by the third-ranked statement, "Integrating other non-leather materials in decorative and

thonging techniques," which received a mean score of 4.46 and exhibited low variability (0.565). This finding indicates that a substantial number of respondents regard the incorporation of non-leather materials as essential for enhancing their creations. Similarly, the statement "Analyzing the task at hand to make a good leather artifact" ranks fourth, with a mean score of 4.44, underscoring the importance of task analysis in the production of high-quality leather products. However, the slightly higher standard deviation (0.646) suggests greater variability in participants' approaches to critical analysis.

Creativity and experimentation are underscored by responses such as "Coming up with my own interpretation of the leather artifacts I produce" (mean = 4.41, rank 5) and "Carry out or design a specific experiment in the studio" (mean = 4.39, rank 6). These statements illuminate the significance attributed to original interpretation and experimentation within the studio environment, albeit with slightly lower rankings compared to more technical skills. Both statements underscore the critical role of individual creativity in leatherwork, while also revealing some variation in the frequency with which these skills are employed.

Responses pertaining to innovation and contextual responsiveness, such as "Coming up with new ways to think about an old leather artifact" (mean = 4.38, rank 7) and "Responding to an idea on leather decorative/thonging in a context-appropriate way to enhance artifact aesthetics" (mean = 4.38, rank 8), indicate that innovative thinking and context-sensitive design responses are held in high regard. However, the higher standard deviations (0.610 and 0.820, respectively) suggest a broader spectrum of opinions regarding their importance.

Finally, lower-ranked skills include "Researching ideas using various types of sources that may not be readily apparent" (mean = 4.33, rank 9) and "Crafting new works in reference to existing ones" (mean = 4.25, rank 11). Although research and reference-based crafting are relevant, they are perceived as less critical than direct experimentation and design processes. Overall, the data suggest that creativity, diverse idea generation, and the integration of new materials and techniques are highly valued in leatherwork, with research and reference-based activities regarded as complementary rather than central to the acquisition of skills.

## 5. Conclusion

The study examined gender disparities in the acquisition of leatherwork skills indicates no significant differences in the engagement and skill development of male and female students. This finding suggests that the intervention pedagogical framework effectively addresses gender considerations in the acquisition of skills in leatherwork. Furthermore, the identification of critical factors influencing creativity reveals that students prioritize idea generation, the integration of novel materials, and the exploration of innovative techniques as fundamental elements of their creative processes. While these factors are essential to skill acquisition, the emphasis placed on specific aspects of creativity may vary between male and female students. The study underscores the importance of addressing gender-specific challenges and enhancing creativity-focused pedagogical strategies to ensure equitable skill development in leatherwork for all students at Tamale Technical University.

**Authors Contribution:** Issah Mohammed Seini: draft preparation, methodology, data analysis, writing original, editing; and Harry Barton Essel & Akosua Tachie-Menson: methodology, review and approval.

**Conflict of Interest:** The authors declare that there is no conflict of interest regarding the publication of this paper

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