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Enhancing creative competence of preservice teachers through pedagogical strategies in fashion design education

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Abstract: This study investigated how to enhance creative competence of preservice teachers through pedagogical strategies in fashion design education. A descriptive survey design was adopted, utilizing a stratified sampling technique to gather data from a total of 188 respondents. The respondents include 165 students, 18 tutors, and 5 principals. The data were collected through a structured questionnaire featuring close-ended questions. The analysis incorporated both descriptive and inferential statistical methods, including frequency percentages, means, standard deviations, and chi-square tests, with a significance level set at $p < 0.05$. The findings revealed that both teacher-related and student-related factors significantly contribute to fostering innovative teaching and learning in the context of fashion design. Pedagogical approaches such as project-based inquiry, experimentation, and the integration of internet resources were identified as particularly effective in enhancing creativity within fashion design education. To further promote student creativity, the study recommends the increased implementation of Technology-Enhanced Learning (TEL) environments and the adoption of strategies such as computer-aided design and outsourcing. Moreover, the study advocates for educational institutions to establish training programs aimed at equipping instructors with the necessary skills to effectively integrate Information and Communication Technology (ICT) into fashion design instruction, thereby advancing creativity in specialized fields.

Keywords: *Creativity, Fashion design, Ghana, Pedagogical strategies, Teacher education, Vocational skills.*

1. Introduction

The fashion design sector is essential to economic expansion. According to Abdulai, et al. [1] it creates jobs for both skilled and unskilled members of society. Fashion begins with a creative idea involving a variety of skills like abilities in market research, creative sketching and selecting appropriate fabric, manipulation of tools and materials, diverging thinking and critical thinking. It is an innovation that opens avenues to new ideas, unique approaches, and new perceptions of circumstances in learning and doing things. This description of creativity shows that the creative process takes time because it involves carefully thought-out activities and the manipulation of tools and materials which requires effective pedagogical practices. Effective pedagogical strategies that promote creativity in fashion design are crucial for developing the critical thinking and technical skills students need to succeed in dynamic industries. Ghana's National Education Strategic Plan highlights the importance of equipping students with relevant skills, particularly in vocational and technical fields like fashion design [2]. However, traditional teacher-centred approaches in technical and vocational education (TVET) have adequately nurtured the creativity essential for these disciplines [3]. This research addresses this gap by exploring pedagogical strategies that can enhance creativity among preservice teachers in fashion design education, aligning with national goals for entrepreneurial education and sustainable development.

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However, despite the growing emphasis on creativity, research has yet to distinctly outline how university educators can cultivate this skill through creative teaching methodologies within specific disciplines or effectively integrate it into curricula [4]. Contemporary scholars argue that while creativity was historically seen as the realm of the exceptionally gifted, most individuals possess the capacity to enhance their creative abilities [5]. Encouraging creativity, particularly among the newer generations, becomes a central focus for university instructors seeking to foster this skill [6].

Investigating contextual elements that influence the growth of creativity is timely as the body of literature expands and new creative pedagogical methods appear. This includes technologies that either support or restrict creativity in practice. To be effective, teachers must use integrated, innovative pedagogical practices in higher education's technology-enhanced learning (TEL) environments [7]. The information and communication technologies (ICTs) that make up these settings include a complex network of new and developing technologies, including learning management systems, mobile technologies, social media, digital image and content editing software, and file-sharing apps [8]. Since many of these new technologies are quite strong, academics with limited time frequently find it challenging to adequately assess them for their potential and instructional usefulness. This research examining current beliefs and practices around creativity and the usage of pertinent supporting technology is timely considering these views.

According to Barron and Harrington [9] the creative process consists of four stages: Preparation, which involves getting ready for the task; Incubation, where ideas develop; Illumination, driven by persistence; and Verification, which involves seeking feedback and criticism. While everyone possesses a degree of creativity, its development significantly shapes an individual's success. The ability to identify and resourcefully seize opportunities has become increasingly crucial. Success in the realm of fashion design demands substantial effort, boundless imagination, and unwavering dedication [10]. For aspiring fashion students aiming to thrive in the dress-making sector, comprehensive and relevant training across various industry facets is indispensable. Particularly, honing skills in idea generation, drawing inspiration, fostering critical thinking, and nurturing creative design abilities stands paramount. Given the ever-evolving nature of the fashion industry, possessing robust creative skills remains foundational [11]. Given the cutthroat competitiveness inherent in fashion, students must be equipped as lifelong learners adept at critical thinking and problem-solving. Many fashion institutions have restructured their curricula to emphasize crucial subjects such as critical thinking, problem-solving, and fashion marketing. This adaptation is essential to prepare students for the discerning preferences of consumers and the demands of the industry.

For both the designers and students to excel in their careers, they must exhibit imagination and innovation in their designs [8]. This involves the ability to craft distinct patterns and garments, necessitating a continuous flow of inventive ideas. In recent years, educators are frequently expected to help satisfy the societal quest for producing creative students that will be relevant in promoting sustainable future developmental strides. Policymakers in different countries are keen on teaching values to the youth that would foster scientific breakthroughs and environmental sustainability. Education is critical in promoting sustainable development and improving creativity and environmental awareness. If students are shown how creativity is valued and rewarded in society, they will develop a sustained interest that would further nurture and enhance their creative artefacts.

1.1. Research Questions

The research was guided by the following questions.

i. How do teacher and student factors promote creative teaching and learning in fashion design?
ii. What pedagogical strategies can be used to promote creativity in fashion design?

1.2. Research Hypotheses

The study tested the following null hypotheses:

H_0: There is no significant relationship between teachers' and students' factors and creative teaching and learning

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in fashion design.
H_{o2} There is a statistically significant relationship between pedagogical strategies used by colleges of education teachers which promote creativity in fashion design.

2. Literature Review

In the vibrant domain of fashion design education, the breeding ground for creativity is a convergence of crucial elements that ignite the flames of innovation and originality. At the heart of this lies an environment that not only allows but actively nurtures experimentation. Key to this is the provision of unfettered access to an expansive array of materials, technologies, and resources [3]. This breadth empowers students to traverse through a jumble of techniques, textures, and designs, fostering a culture of exploration and discovery [12]. The significance of hands-on engagement with fabrics, sewing machines, digital design tools, and an assortment of equipment cannot be overstated [13]. These tools serve as conduits, allowing fledgling designers to seamlessly translate their nascent ideas into palpable manifestations, thereby sowing the seeds of creativity through practical application. Beyond the tangible tools lies an equally pivotal yet intangible factor, the celebration of diversity and individuality. Encouraging students to draw from the wellspring of their unique backgrounds, cultural perspectives, and personal experiences begets a wealth of design perspectives [14]. Embracing this diversity culminates in the emergence of fresh ideas that increase the fashion environment with novel narratives and innovative concepts [15].

Another basis for the organization of creative learning within fashion design is collaboration and interdisciplinary approaches [16]. Initiatives that encourage teamwork among students boasting diverse skill sets be it fashion designers, textile virtuosos, or marketing mavens engender an electric exchange of ideas. These collaborative projects birth innovative solutions and designs that seamlessly amalgamate disparate disciplines, breathing life into groundbreaking creations that challenge the conventional [17]. Supplementing this educational area are real-world experiences and industry connections, both of which serve as potent catalysts for creative pedagogy [18]. Inviting industry professionals for guest lectures, conducting workshops, facilitating internships, and orchestrating industry visits are portals that offer invaluable glimpses into the practical nuances of fashion design. They unveil the current trends, market demands, and professional practices, prodding students to critically analyze and infuse their designs with industry resonance [19]. However, the development of an atmosphere that values taking risks and accepts failure as an essential component of the learning process is crucial to this creative process. Students who are encouraged to push boundaries, make bold creative leaps, and learn from mistakes are more resilient and courageous in their design endeavors [20]. In the end, this resilience produces a generation of designers whose work is teeming with creativity and breakthroughs, advancing the field into previously unexplored creative spheres.

Developing students' skills in the fashion design industry is essential to fostering their creativity. Students use this as a foundation to develop their own trends and styles. In educational settings, pedagogical strategies are essential for encouraging creative development [21]. Project-based learning, in which students work on open-ended projects that promote creativity and exploration, is one especially effective tactic [22]. This method improves students' technical proficiency and creative abilities by enabling them to plan, organize, and realize their ideas. Another successful tactic is collaborative learning, which gives students the chance to cooperate in groups and combine a variety of viewpoints and abilities [23]. In group settings, the exchange of ideas and critical discussions can inspire fresh concepts and challenge conventional design thinking, pushing the boundaries of fashion design [24].

Creative learning experiences are further enhanced when interdisciplinary studies are incorporated into the curriculum [4]. Students learn more about a variety of influences and worldwide trends when art history, sociology, technology, and sustainability are incorporated into fashion design courses. They are able to incorporate depth and creativity into their designs by drawing inspiration from a variety of sources thanks to this holistic viewpoint. Additionally, it is crucial to conduct practical experiments with

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materials, textiles, and emerging technologies [25]. Having access to well-equipped labs and workshops inspires students to experiment with unusual materials and methods, fostering their creativity and promoting conventional fashion design methods [26].

Learners' creative development is also greatly aided by industry professionals' mentoring and advice [27]. Workshops, guest lectures, and internships with seasoned designers offer practical insights and industry knowledge [28]. In addition to acquainting students with professional norms, these experiences encourage them to bring their imaginative ideas to life in real-world situations. Reflective practice is just as crucial to this process of development. Students get a better grasp of their creative journey when they critically evaluate their design processes and weigh both achievements and setbacks [29]. This introspective method serves as a roadmap for ongoing development, enabling students to hone their abilities and develop into creative designers.

3. Methodology

3.1. Research Design

The effectiveness of pedagogical strategies in fostering creativity in fashion design was examined in this study using a quantitative approach. Through methodical measurement and analysis of data pertaining to the effects of different teaching strategies on students' creative development, this approach made it possible to validate hypotheses. In order to facilitate the quick collection of a substantial amount of data in a short amount of time, a descriptive survey design was used [30]. The design was chosen due to its versatility and ability to support, elaborate on, or validate the hypotheses related to a particular population. Therefore, descriptive survey design was employed to facilitate data collection process from a widely distributed sample within the study area. Descriptive surveys are used to accurately portray the traits of people, circumstances, or groups. They serve as crucial instruments for determining needs, supporting well-informed decision-making and laying the framework for more focused educational research projects. Nevertheless, Mugenda and Mugenda [31] point out that because the descriptive survey approach examines personal issues that people might not fully disclose honestly, it may have trouble yielding completely trustworthy results. This is why a clause allowing for follow-up questions to get more information was included.

3.2. Research Population

This study focused on investigating accessible populations within specific educational institutions in the Ashanti Region of Ghana. The research encompassed a total of 791 students, 30 tutors, and eight principals across eight colleges of education situated in six districts: Offinso Municipality, Adansi West District, Kumasi Metropolitan, Mampong Municipality, Asante Akin North District, and Sekyere South District. The breakdown of these categories within the target population is outlined in Table 1, aiding the researcher in determining the groups accessible for the study.

Table 1.
Distribution of target population.

Group	Population
Fashion Design Students	791
Fashion Design Teachers	30
Principals	8
Total	829

3.3. Sampling Techniques

A subset of a larger population is extracted through the process of sampling [32]. Three different sampling techniques were used in this study to guarantee that the target population was fully represented. These techniques—stratified random sampling, purposive sampling, and simple random sampling were deliberately selected to successfully represent the study's varied demographics. Offinso Municipality, Adansi West District, Kumasi Metropolitan, Mampong Municipality, Asante Akin North

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District, and Sekyere South District were the six districts into which the Ashanti Region was divided using stratified random sampling. This approach made it possible to divide the area into five different groups: central, east, west, south, and north. A sample size of 188 was then obtained by simply selecting 18 tutors and 165 students from five education colleges, and purposefully selecting 8 principals. The researcher was able to choose participants who were thought to have the most pertinent data for the study thanks to this approach [33]. A well-considered and manageable sample size that supports efficient data collection is demonstrated by Table 2, which breaks down this aggregate sample and its corresponding percentages.

Table 2.
Sampling Grid of Participants of the Study.

Participants	Population	Sampled	Percentage
Fashion Design Students	550	165	30.0
Fashion Design Tutors	30	18	60.0
Principals	8	5	62.5
Total	588	188	50.2

3.4. Instruments

The researchers created a questionnaire with closed-ended questions that was used to collect the data. It was designed specifically to collect data from participants in accordance with the study questions. The questionnaire was a key component of the data collection process, consisting of two separate sets (tutors' & students' questionnaires). Section A contained demographic information, Section B included factors influencing creative teaching, and Section C contained pedagogical strategies for fostering creativity. It was logically organized into five sections. Questionnaire items were rated by the respondents using a five-point Likert scale.

3.5. Validity and Reliability Tests

The validity and reliability test of the instrument was done through piloted at colleges that were not part of the study. The result for the first test was generated by a Cronbach's alpha coefficient of 0.71. Nevertheless, some items recorded a Cronbach's alpha value of 0.40 thus dropping below the acceptable threshold of 0.6. Therefore, such items were modified and ret-tested resulting in an improved alpha value of 0.73. This value was therefore accepted as appropriate for judging the reliability of the instrument in generating the required data.

3.6. Data Analysis

The data analysis encompassed both descriptive and inferential statistics. These statistics include frequency tables, percentages, means, standard deviations and the chi-square test with the p-value being significant at .05 ($p < 0.05$). Table 3 provides an overview of research questions, hypotheses, and the statistical tools used for measurement.

Table 3.
Research questions, Hypotheses, and Measuring Statistical Tools.

Research questions	Hypotheses	Statistical Methods
i. How do teacher and student factors promote creative teaching and learning in fashion design?	Ho1: There is no significant relationship between teachers' and students' factors and creative teaching and learning in fashion design.	Frequency count. & Percentage Chi-square
ii. What pedagogical strategies can be used to promote creativity in fashion design?	Ho2: There is a statistically significant relationship between pedagogical strategies used by colleges of education teachers which promote creativity in fashion design.	Frequency count. & Percentage Inferential Chi-square

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4. Results and Discussions

4.1. Results

How do teacher and student factors promote creative teaching and learning in fashion design?

Research question one sought to find out from both teachers and students, factors that promote creativity in fashion design in vocational skills programmes at the colleges of education in Ghana. According to Palinkas, et al. [34] teachers play a pivotal role in providing creativity to students by allowing learners to develop high cognition. Based on this assertion, the study examined teacher factors that promote creative teaching and learning in fashion design in the colleges of education in Ghana.

4.2. Teacher Factors

Table 4 provides a summary of the various factors enumerated by the teachers. The responses were given by using strongly agree (SA), agree (A), neutral (N), disagree (D) and strongly disagree (SD).

Table 4.
Teacher Factors Promoting Creativity in Fashion Design at Colleges of Education.

Statement	N=18	SA	A	N	D	SD
Practicing the traditional method of teacher-centered instruction brings out students' creativity.	F	2	5	1	7	3
	%	11	27.8	5.6	38.9	16.7
Practising the traditional method of teacher-centred instruction does not allow me to be creative enough.	F	4	7	1	6	0
	%	22.2	38.9	5.6	33.3	0
Focusing on students' interests and adopting a student-centred approach does not bring out students' creativity innovatively.	F	3	3	3	5	4
	%	16.7	16.7	16.7	27.8	22.2
Focusing on students' interests and adopting a student-centred approach brings out creative ideas from my students.	F	10	7	0	1	0
	%	55.6	38.9	0	5.6	0
Posting a question and allowing classroom discussion among students has been great at creating new ideas.	F	7	9	0	1	1
	%	38.9	50	0	5.6	5.6
Posing a question and allowing interactive brainstorming does not bring out new ideas.	F	9	8	0	0	1
	%	50	44.4	0	0	5.6
Classrooms are conducive to teaching creativity.	F	3	3	2	7	3
	%	16.7	1.6.7	11.1	38.9	16.7
The teachers are afraid to promote risk-taking.	F	1	7	4	6	0
	%	5.6	38.9	22.2	33.3	0
My family supports me financially and that helps me to explore new creative ideas from many places.	F	1	4	4	9	0
	%	5.6	22.2	22.2	50	0
My family do not support me financially and that makes me not to explore new creative ideas from many places.	F	1	8	5	4	0
	%	5.6	44.4	27.8	22.2	0
The teaching and learning equipment are outmoded for creative teaching	F	4	8	2	3	1
	%	22.2	44.4	11.1	16.7	5.6
The teachers are not interested in mastery CAD	F	2	9	3	2	2
	%	11.1	50	16.7	11.1	11.1
The teachers sometimes do collaboration creative leaning during their workshops.	F	6	8	0	3	1
	%	33.3	44.4	0	16.7	5.6

The data in Table 4 presents data about how teacher practices impact the promotion of creativity in fashion design at Colleges of Education. A notable finding is a general skepticism toward traditional, teacher-centred instruction: 38.9% of teachers disagreed and 16.7% strongly disagreed that these methods foster student creativity, while only a small portion (11% strongly agreed and 27.8% agreed) believed otherwise. This suggests that most educators view conventional teaching techniques as ineffective in sparking creative thinking. Additionally, a substantial number (22.2% strongly agreed and 38.9% agreed) felt that traditional instruction stifles their own creativity, highlighting the need for more engaging and flexible teaching approaches. On the other hand, the data reveal a strong endorsement of student-centered methods. An overwhelming majority (55.6% strongly agreed and 38.9% agreed) felt that focusing on students' interests and employing student-centred strategies significantly enhances creativity. Furthermore, teachers widely supported interactive practices, with 50% strongly agreeing

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and 38.9% agreeing that classroom discussions generate new ideas. However, outdated teaching equipment emerged as a challenge, with 44.4% agreeing and 22.2% strongly agreeing that it limits creative teaching. Collaboration among teachers was also viewed positively, with many (44.4% agreed and 33.3% strongly agreed) believing that working together during workshops fosters creativity. The responses regarding financial support and willingness to take risks were more varied, reflecting the complexity of factors that influence creative learning in fashion design education.

4.3. Students' Factors that Promote Creative Learning in Fashion Design

The study delved into student factors that promote creativity among students in fashion design. The students were presented with eight statements on factors that deal with creativity in fashion design and asked to show their level of agreement with the statement using strongly agree (SA), agree (A), neutral (N), disagree (D) and strongly disagree (SD). Table 5 presents a summary of the responses provided.

Table 5.
Students' Factors that Promote Creativity in Fashion Design.

Statement	N=165	SA	A	N	D	SD
Practicing sewing beyond the classroom improves my creativity	F	119	34	9	2	1
	%	72.1	20.6	5.5	1.2	.6
Finish assignments and going beyond my classroom coursework improves my creativity	F	76	71	14	2	2
	%	46.1	43	8.5	1.2	1.2
Thinking beyond what the tutor is telling me and implementing it improves my creativity	F	83	63	9	5	5
	%	50.3	38.2	5.5	3	3.0
Engaging my community with questions on fashion gives me new creative ideas	F	74	62	22	3	4
	%	44.8	37.6	13.3	1.8	2.4
Researching online materials on fashion boosts my creativity	F	90	50	15	6	4
	%	54.5	30.3	9.1	3.6	2.4
My family hardly inspires me to try a new idea	F	34	52	44	15	20
	%	20.6	31.5	26.7	9.1	12.1
Lack of financial support hinders creative idea	F	65	54	33	7	6
	%	39.4	32.7	20	4.2	3.6
Resources and structures stimulate creative learning	F	53	68	25	6	13
	%	32.1	41.2	15.2	3.6	7.9

The data in Table 5 highlight key factors from students' perspectives that foster creativity in fashion design education. A striking finding is that a significant majority of students (72.1% strongly agreed, 20.6% agreed) feel that practicing sewing outside the classroom is essential for enhancing their creativity. Similarly, a large portion of students (46.1% strongly agreed, 43% agreed) believe that completing assignments and going beyond the coursework positively impact their creative development. This suggests that students recognize the importance of engaging in activities and practice beyond classroom instruction to improve their creative skills. Independent thinking and community engagement also play a critical role in fostering creativity. Half of the students (50.3% strongly agreed, 38.2% agreed) expressed that applying ideas beyond what their tutors teach enhances their creativity. Additionally, engaging with the community to discuss fashion ideas was seen as beneficial, with 44.8% strongly agreeing and 37.6% agreeing. Researching fashion-related materials online was another factor that students found valuable, with 54.5% strongly agreeing. However, financial support and familial influence presented challenges: 39.4% strongly agreed that a lack of financial support hindered their creative pursuits, while only 20.6% felt uninspired by their families to try new ideas. Access to resources and a conducive learning environment were also considered important, with 32.1% strongly agreeing and 41.2% agreeing that such structures stimulate creativity.

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Table 6.
Chi-square analysis.

Statement	N=165		Students' Creative Ability			X^2	P Value
			A	N	D		
Practicing sewing beyond the classroom improves my creativity	A	F	93	35	2	9.584	0.044
		%	56.36	21.21	1.21		
	N	F	8	23	0		
		%	4.85	13.94	0		
	D	F	0	1	3		
		%	0	0.06	1.81		
Finish assignments and going beyond my classroom coursework improves my creativity	A	F	108	38	1	9.408	0.049
		%	65.45	23.03	0.6		
	N	F	10	3	1		
		%	6.06	1.82	0.6		
	D	F	1	3	0		
		%	0.61	1.82	0		
Thinking beyond what the tutor is telling me and implementing it improves my creativity	A	F	104	38	2	10.829	0.035
		%	63.03	23.03	1.21		
	N	F	10	1	0		
		%	6.06	0.61	0		
	D	F	5	5	0		
		%	3.03	3.03	0		
Engaging my community with questions on fashion gives me new creative ideas	A	F	103	35	0	15.863	0.003
		%	62.42	21.21	0		
	N	F	13	6	1		
		%	7.88	3.64	0.61		
	D	F	3	3	1		
		%	1.82	1.82	0.61		
Researching online materials on fashion boosts my creativity	A	F	105	32	2	10.823	0.036
		%	63.64	19.39	1.21		
	N	F	10	7	0		
		%	6.06	4.24	0		
	D	F	4	5	0		
		%	2.42	3.03	0		
My family hardly inspires me to try a new idea	A	F	66	18	2	6.208	0.184
		%	40.0	10.91	1.21		
	N	F	32	12	0		
		%	19.39	7.27	0		
	D	F	21	14			
		%	12.73	8.48			
Lack of financial support hinders creative idea	A	F	82	36	2	12.633	0.049
		%	49.7	21.82	1.21		
	N	F	30	2	0		
		%	18.18	1.21	0		
	D	F	5	1	0		
		%	3.03	0.61	0		
Resources and structures stimulate creative learning	A	F	81	37	2	10.873	0.043
		%	49.09	22.42	1.21		
	N	F	23	2	2		
		%	14.55	1.21	1.21		
	D	F	14	5	0		
		%	8.48	3.03	0		

The analysis presented in Table 6 examines the relationship between various student-related factors and their impact on creativity in fashion design education, utilizing Chi-square statistics. One of the key findings indicates that engaging in sewing activities beyond the classroom is positively linked to students' creative abilities, as evidenced by a Chi-square value of 9.584 and a p-value of 0.044. This

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suggests that students who participate in sewing outside of their formal education report greater creativity, with 56.36% of respondents affirming this viewpoint. This highlights the significance of hands-on experience in cultivating creativity. Furthermore, the results show that completing assignments and extending learning beyond the classroom also correlates significantly with creative abilities, as reflected by a Chi-square value of 9.408 and a p-value of 0.049. A notable 65.45% of students indicated that engaging with coursework beyond the requirements enhances their creativity, which underscores the importance of proactive engagement in learning for fostering creativity. The analysis also highlights the importance of independent thinking. Students who think beyond what their tutors instruct and apply those insights tend to demonstrate enhanced creativity, as shown by a Chi-square value of 10.829 and a p-value of 0.035. A majority (63.03%) of students agreed that implementing their own ideas based on classroom teachings significantly boosts their creative skills, indicating the value of self-directed exploration in education. Moreover, community engagement plays a crucial role in enhancing creativity, with a highly significant association revealed ($X^2 = 15.863$, $p = 0.003$). A substantial 62.42% of students noted that asking questions and interacting with their community provides them with new creative ideas, highlighting the community as a vital source of inspiration. Additionally, researching online materials related to fashion positively influences creativity, with a Chi-square value of 10.823 and a p-value of 0.036. A significant 63.64% of students reported that accessing online resources boosts their creativity, emphasizing the role of digital platforms in idea generation and skill development.

In contrast, the influence of family support on creativity was not found to be significant ($X^2 = 6.208$, $p = 0.184$), suggesting that many students may not rely heavily on familial encouragement, with only 40% expressing that they find inspiration from their families. Conversely, the analysis did show a significant connection between financial support and creativity ($X^2 = 12.633$, $p = 0.049$), with nearly half (49.7%) of students acknowledging that a lack of financial resources limits their creative opportunities. This finding highlights the critical role that financial stability plays in facilitating creative exploration. Finally, the availability of adequate resources and supportive structures for learning is significantly correlated with creative abilities, indicated by a Chi-square value of 10.873 and a p-value of 0.043. Almost half (49.09%) of students agreed that a well-resourced environment fosters creativity, reinforcing the idea that appropriate facilities are essential for nurturing creative skills. Therefore, based on these statistically significant associations between student factors and students' creative ability, the study rejects the null hypothesis.

Table 7.
Teachers' Pedagogical Strategies to Promote Creativity among their Students in Fashion Design.

Statement	N=18	SA	A	N	D	SD
Obtaining information from the internet can equip students with ideas for creativity	F	11	6	0	1	0
	%	61.1	33.3	0	5.6	0
Teaching strategies like experiments and project-based inquiry can expose them to acquiring creativity in fashion design.	F	6	9	1	1	1
	%	33.3	50	5.6	5.6	5.6
Introducing a creative environment in schools can promote new ideas in creativity.	F	6	11	0	0	1
	%	33.3	61.1	0	0	5.6
Encouraging logical thinking by using hands-on activities and problem-solving activities can assist students in creativity.	F	12	5	0	1	0
	%	66.7	27.8	0	5.6	
Only emotional support during the teaching and learning processes is not sufficient for developing creative skills among students.	F	2	6	3	6	1
	%	11.1	33.3	16.7	33.3	5.6
The use of demonstration lessons during fashion design practical lessons promotes creativity.	F	5	12	0	1	0
	%	27.8	66.7	0	5.6	0

4.4. What Pedagogical Strategies Can Be Used to Promote Creativity in Fashion Design?

The second objective of the study is to identify the pedagogical strategies for promoting the teaching and learning of creativity in fashion design. The data were sought through six statements as

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the teachers rated strongly agree (SA), agree (A), neutral (N), disagree (D) and strongly disagree (SD). This was used to show their levels of agreement with the statements. Table 7 presents a summary of the responses given by the teachers.

Table 7 provides insight into the pedagogical strategies that educators use to enhance creativity among students in fashion design programs. A significant portion of teachers, specifically 61.1% who strongly agree and 33.3% who agree, acknowledge that accessing information online plays a vital role in equipping students with innovative ideas. This finding highlights the internet's importance as a valuable resource for broadening students' creative perspectives and encouraging inventive thinking. The effectiveness of experiential learning approaches, such as experiments and project-based inquiry, receives a more mixed response. While 33.3% of teachers strongly agree and 50% agree that these teaching strategies foster creativity, a small fraction (5.6%) expresses disagreement. The results indicate that even though a large number of educators acknowledge the importance of inquiry-based and hands-on learning, there is still room to improve how these approaches are used in classrooms. Furthermore, the data show strong support for creating creative spaces in schools, with a sizable percentage of teachers agreeing that these settings promote the generation of fresh concepts. This emphasizes how crucial emotional and physical learning environments are for encouraging students' creativity. Practical exercises and problem-solving assignments are also highly valued since many educators recognize how well they foster students' curiosity and inventive thinking.

On the topic of emotional support during teaching and learning, opinions are somewhat divided. While a small group of educators believes that emotional support alone is sufficient for nurturing creativity, others disagree, highlighting the need for a more balanced approach that integrates both emotional and practical learning experiences. This reflects varying perspectives on the role of emotional engagement in the development of creative skills. This indicates that although emotional encouragement is valuable, it must be complemented with other instructional strategies to effectively cultivate creativity in students. Finally, the findings suggest that demonstration lessons during practical fashion design classes are viewed positively, with 27.8% of teachers strongly agreeing and 66.7% agreeing that this approach promotes creativity. This consensus underscores the effectiveness of direct demonstrations in enhancing students' comprehension and application of creative techniques.

H_{02}: The pedagogical strategies used by colleges of education teachers do not influence creativity in fashion design.

A chi-square analysis test was done to test the study's second null hypothesis which was. The chi-square analysis results are presented in Table 8.

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Table 8.
Chi-Square Analysis: Pedagogical strategies and students' creative ability.

Statement	N=165		Students' Creative Ability			X^2	P Value
			A	N	D		
The tutors obtaining information from the internet can equip students with ideas for creativity	A	F	82	16	54	012.379	.015
		%	49.7	9.7	32.73		
	N	F	4	0	0		
		%	2.42	0	0		
	D	F	8	1	0		
		%	4.85	0.61	0		
Tutors use teaching strategies like experiments and project-based inquiry in fashion design but are allowed to ask teachers for help to acquire creativity in fashion design.	A	F	76	14	44	19.297	0.004
		%	46.06	8.48	26.67		
	N	F	4	0	8		
		%	2.42	0	4.85		
	D	F	14	2	2		
		%	8.48	1.21	1.21		
The tutors introduce a creative environment in schools where I am allowed to brainstorm to bring out new ideas in creativity.	A	F	86	16	53	10.829	0.035
		%	52.12	9.70	32.12		
	N	F	0	0	1		
		%	0	0	0.61		
	D	F	8	1	0		
		%	4.85	0.61	0		
Tutors encourage logical thinking by using hands-on activities and problem-solving activities to assist students in creativity. assist my creativity.	A	F	85	16	54	11.664	0.023
		%	51.25	9.70	32.73		
	N	F	1	0	0		
		%	0.61	0	0		
	D	F	8	0	0		
		%	4.85	0	0		
Tutors' provision of emotional support through classroom interactions does not assist my interest in creativity.	A	F	46	6	17	10.823	0.036
		%	27.88	3.64	10.3		
	N	F	16	6	13		
		%	9.7	3.64	7.88		
	D	F	32	5	24		
		%	19.39	3.03	14.55		
Demonstration methods often used during fashion design practical lessons promote my creativity	A	F	85	16	54	13.651	0.022
		%	51.52	9.60	32.73		
	N	F	1	0	0		
		%	0.61	0	0		
	D	F	8	1	0		
		%	4.85	0.61	0		

Table 8 presents a Chi-Square Analysis of the relationship between various pedagogical strategies and students' creative abilities. The first statement examines whether tutors' use of online resources to provide students with ideas enhances creativity. The results show a significant positive effect (X^2 = 12.379, p = 0.015), with nearly half of the students (49.7%) agreeing that this approach promotes creativity, while 32.73% disagreed, suggesting varying levels of impact. The second statement explores the impact of teaching strategies like experiments and project-based inquiry in fashion design, where students are encouraged to seek help from tutors. The analysis reveals a strong significant effect on creativity (X^2 = 19.297, p = 0.004), with 46.06% of students affirming that these strategies help foster creativity, while 26.67% disagreed. This indicates that hands-on, inquiry-based methods are linked to improved creative abilities. In the third statement, the role of a creative environment in schools, where students are allowed to brainstorm and develop new ideas, is examined. This pedagogical approach also shows a significant effect on students' creativity (X^2 = 10.829, p = 0.035), with 52.12% of students agreeing that such an environment supports creativity. However, 32.12% disagreed, highlighting that the influence of the environment may vary. The fourth statement addresses the use of hands-on

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activities and problem-solving tasks to encourage logical thinking and creativity. The results indicate a significant positive relationship ($X^2 = 11.664$, $p = 0.023$), with over half of the students (51.25%) affirming that these activities contribute to their creative development. This suggests that practical and problem-solving tasks are effective in enhancing creativity. The fifth statement investigates the role of emotional support from tutors during classroom interactions. The findings show mixed results but remain statistically significant ($X^2 = 10.823$, $p = 0.036$). While 27.88% of students disagreed that emotional support fosters creativity, indicating a limited impact, 19.39% of students agreed, pointing to a more varied influence on creative engagement. Finally, the statement about demonstration methods in fashion design practical lessons highlights a positive correlation with creativity ($X^2 = 13.651$, $p = 0.022$), with 51.52% of students affirming that these methods help boost creativity, while 32.73% disagreed. This suggests that demonstrations in practical lessons are perceived as beneficial for developing creative abilities in students.

5. Discussion

This study determined the impact of Technology-Driven Teaching Methods on Creative Skill Development among Fashion Design Students at Colleges of Education in Ghana. The data on how teacher practices influence the promotion of creativity in fashion design education at Colleges of Education indicate a predominant concern among educators regarding the ineffectiveness of traditional, teacher-centred instructional methods, with a notable majority expressing skepticism toward these approaches. This skepticism aligns with findings from Wang [35] who emphasized that traditional pedagogical methods often restrict students' creative potential in fashion design, necessitating a shift toward more innovative teaching strategies. Furthermore, a lot of teachers think that conventional teaching approaches not only don't encourage students' creativity but also limit their own ability to express themselves creatively. This observation supports the findings of Mark [36] which show how traditional teaching methods in fashion and design education can impede the growth of both teachers and students. A greater awareness of the value of creativity-driven instruction is evident in the apparent shift towards student-centered approaches, with many educators supporting instructional strategies that put learners' interests first. With many educators concurring that classroom discussions foster idea generation, interactive strategies also garnered a lot of support, highlighting the importance of effective teaching methods. De Wet and Smal [37] who stress the need for creative teaching models that integrate blended learning and emotional engagement to foster creativity, concur with this viewpoint.

However, issues with antiquated teaching materials surfaced, and many teachers admitted that their capacity to teach creatively is hampered by their lack of access to contemporary technology. This supports the findings of Jun and Hui [38] who pointed out that the adoption of innovative educational practices can be hampered by a lack of resources. Teachers working together was also viewed favorably; many expressed the opinion that collaborative efforts during workshops foster more innovative thinking. This viewpoint backs up Prianka [39] claim that in order to foster creative abilities in design education, teamwork is essential. However, there were conflicting answers about financial support and willingness to take risks, which illustrates how complicated the variables affecting creative learning are. This inconsistency points to the need for deeper exploration of how institutional support structures can better facilitate innovative teaching approaches in fashion design education.

The data shows elements that support creativity in fashion design education from the viewpoints of the students. One notable finding is that students strongly believe that sewing outside of the classroom is crucial for fostering creativity. This is consistent with the findings of Robinson, Freeburg, and Workman (2013), who emphasized the importance of independent practice outside of the classroom in helping students develop their creative skills. Students can experiment and hone their skills through sewing activities outside of the classroom, which strengthens their bond with the design process.

In a similar vein, students understand the benefits of assignments and go above and beyond the required coursework to further their creative growth. This corroborates the findings of Yen and Hsu

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[40] who noted that students who actively pursue interests outside of the prescribed curriculum typically produce more imaginative and creative design work. Students can interact more fully with the material when learning takes place outside of the classroom, which fosters creativity and improves their design skills. Students stated that applying concepts beyond what their tutors teach them is essential to developing their creative potential, indicating that independent thinking also emerged as a significant factor in fostering creativity. This finding is in line with that of Ernawati [41] who found that fashion design students who study and research independently outside of the classroom produce more original and creative work. Additionally, students had a positive opinion of community involvement because they believed that sharing fashion ideas with others stimulated their own creativity. Engaging with peers and the broader fashion community can foster creativity and produce new ideas, claim [42]. Additionally, the data showed how much students value researching fashion online, with many claiming that these resources are crucial to their creative process. This backs up the findings of Amos, et al. [43] who highlighted the value of digital platforms in extending students' exposure to cutting-edge design methods and worldwide trends, which enhances their creative growth. The accessibility of these materials fosters creativity by enabling students to remain up to date on and motivated by new fashion trends. The data does, however, also highlight issues with family influence and financial support. Lack of funding was cited by many students as a barrier to their artistic endeavors, which is a common problem in fashion design education. Robinson, et al. [44] also emphasized how students' capacity to try out novel concepts can be restricted by financial limitations, as they might not have the resources to realize their imaginative ideas. As fewer students report feeling uninspired by their families, the data also suggests that family support has less of an impact on students' creativity. Lastly, the data indicate that two important elements that foster creativity are having access to resources and a nurturing learning environment. According to students, having access to the right resources and a supportive learning environment enables them to express their creative ideas more effectively. This resonates with Asemsro and Obinnim [42] who found that the availability of resources and a positive educational environment are essential for fostering creativity in fashion design students. Without these resources, students may struggle to translate their ideas into tangible designs.

The results shed more light on the instructional techniques teachers use to foster creativity in fashion design courses. It is noteworthy that educators generally agree about the value of online resources, with many admitting that having access to digital platforms is essential for stimulating students' original thought processes. Mark [36] observations, which emphasize the internet as a crucial channel for expanding students' knowledge of modern fashion trends and cutting-edge design techniques, align with this viewpoint. Students' creative thinking and problem-solving abilities are improved by the variety of influences they encounter through online exploration. Teachers' responses to experiential learning strategies, like project-based inquiry and practical experiments, were not entirely consistent. Although a lot of people think these tactics are good, some people have doubts about how well they work to encourage creativity. This suggests that there are still issues with implementing interactive learning in the classroom, even with its acknowledged benefits. This result supports the findings of Jemberie [45] who pointed out that constructivist teaching strategies foster student creativity by promoting critical reflection and active engagement. The difficulties in successfully incorporating experiential learning into fashion design education are highlighted by the disparities in educator viewpoints.

Furthermore, there is a lot of support for creating encouraging and supportive learning environments, as many educators concur that these kinds of environments foster creativity. This perspective supports Jamaludin [46] claim that physical and emotional learning environments have a big impact on creative development. In addition to promoting risk-taking, a supportive classroom environment also facilitates candid idea exchange, both of which are essential for creative inquiry. This viewpoint is supported by Mothiram [47] who highlights the importance of a supportive environment in developing students' creative potential. Teachers appreciate problem-solving exercises and practical activities equally because they foster creative thinking. This bolsters Lu [48] claim that practical design

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tasks enable students to use their imagination in authentic situations. On the other hand, there are differing views regarding whether emotional support is enough to promote creativity. Although some educators think it's sufficient, many think that in order for it to be really effective, it must be used in conjunction with structured teaching methods. Additionally, Reabenchi [49] highlights that when combined with well-organized teaching techniques, emotional support greatly increases students' creativity. This divergence of opinions implies that a well-rounded strategy that incorporates both instructional and emotional support is essential for the development of creativity in fashion design education. Lastly, there is broad consensus among teachers regarding the value of demonstration lessons in hands-on design courses for fostering creativity.

This agreement emphasizes how well students learn creative techniques through direct demonstrations. It is consistent with Jamaludin [46] observation that live demonstrations allow students to witness the implementation of design principles in real time, encouraging them to try new things and hone their creative abilities. Students' capacity to convert their imaginative concepts into tangible designs is strengthened by demonstrations, which act as a vital bridge connecting theoretical knowledge and real-world application.

6. Limitation

This study was conducted in preservice teacher education. Therefore, the results do not establish the extent to which in-service teachers have acquired creative skills. This requires further research for policy formulation.

7. Recommendations

In practice, the study recommends that teachers and principals of vocational colleges should promote the use of technology-enhanced learning (TEL) environments. This can be done by using outsourcing and use of CAD to promote student creativity.

Colleges of education institutions should train teachers on how to integrate ICT in teaching and learning to promote creativity in fashion design education

Regular workshops and training sessions are essential to acquaint both faculty and students with the newest technological tools and software prevalent in the fashion industry.

Teacher training institutions should establish collaborations with key players in the fashion industry, enabling students to access internships that provide hands-on experience.

Future researchers should take up a study on exploring diverse pedagogical methods for integrating technology into fashion design education.

8. Conclusion

The study investigates how technology-driven teaching methods influence the creative skills of fashion design students at colleges in Ghana. It highlights a prevalent concern among educators regarding traditional, teacher-centred instructional methods, which many believe restrict both student creativity and their own ability to innovate. In response to these limitations, educators are increasingly advocating for student-centred teaching approaches that prioritize active student engagement through interactive methods. From the perspective of learners, engaging in independent sewing practice outside of classroom settings is regarded as essential for enhancing their creative abilities. They also recognize the value of assignments that encourage inquiry outside of the prescribed curriculum because they help them hone their design abilities. Additionally, it is acknowledged that community engagement and online resource availability are advantageous for promoting creative development. However, it is determined that a major obstacle that prevents them from experimenting and reaching their full creative potential is money. According to the study, having access to sufficient tools and resources is essential for effective creative expression, underscoring the significance of a supportive learning environment. It can be concluded that fostering creativity in fashion design education necessitates a blend of structured

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teaching techniques and emotional support, fostering an environment that promotes experimentation and skill improvement.

Institutional Review Board Statement:

The Ethical Committee of the National Council of Tertiary Education, Ghana has granted approval for this study on 14 November 2019 (Ref. No: GA452-0871).

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Copyright:

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