

# Analysis of Mobile Learning and Students' Performance in Fashion Design Courses in Technical Universities in Ghana

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**Abstract:** The purpose of this study was to investigate the effectiveness of Mobile learning demonstration and students' achievement in practical fashion design and textiles courses in technical universities in Ghana. This study employed a quasi-experimental pre-test/post-test between-subjects design. The sample size for the study was 543 (3 lecturers & 540 students). The study used a questionnaire, an interview guide, focus group discussions, and document analysis to collect quantitative and qualitative data from participants. The study found that the majority of fashion design students at technical universities in Ghana preferred face-to-face ICT lectures to M-learning, as they found it difficult to observe lecturers' demonstrations in M-learning modes. Students in experimental groups had higher mean post-test scores when taught using the face-to-face ICT mode of lecture delivery than students in control groups taught using M-learning. The study recommended that lecturers teaching fashion design and textiles practical courses in technical universities should not use M-learning for teaching practical courses.

**Keywords:** Mobile learning, face-to-face ICT modes of teaching, and students' achievements.

## 1. Introduction

M-learning refers to the use of mobile or wireless devices for teaching and learning [1; 2], which are small, portable gadgets that can be used for computing, information storage and retrieval, as well as multimedia and communication [3]. Portable media players, smartphones, tablets, personal digital assistants, and e-book readers are examples of mobile devices frequently used in m-learning [4;5;6]. According to Behera [7], mobile learning, also known as M-learning, is a form of teaching and learning that utilises small, portable computing devices such as smartphones, personal digital assistants (PDAs), tablets, and laptop computers with a two-way internet connection as an integral component.

The development of mobile technology in education has created numerous teaching, training, and learning means, providing educationalists with novel teaching approaches [8], including mobile learning (M-learning). This learning style in non-formal and elective educational settings presents opportunities to improve teaching and support innovation in schools and beyond [9]. M-learning allows students to use their gadgets, including smartphones and tablets, and is completely independent of university-proprietary software and hardware [10], which encourages learning in students' personal, physical, and virtual environments outside of the classroom. In light of this, M-learning prioritizes mobility, access, immediacy, situatedness, ubiquity, convenience, collaboration, and contextuality, and this method of instruction has mobility characteristics in physical, conceptual, and social spaces [11]. Numerous studies have shown that m-learning enables educators and learners to engage in experiential and situated learning without being constrained by time, place, or technological constraints. This extends the traditional teacher-led classroom scenario through informal learning activities outside the classroom, improving self-directed learning.

Also, M-learning can foster an optimistic learning environment, permitting students to cooperate, pursue information, and partake in the knowledge-formation process [12], and enhance student-teacher and learner-learner interaction and communication. Additionally, M-learning mode of delivery allows learners to apply knowledge and skills immediately and can receive instant communication and feedback [13;14], thus helping students achieve higher levels of knowledge [15].

Mobile learning, such as Zoom cloud meetings and Google Class meetings, as a mode of lesson delivery, was introduced

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into Ghana's tertiary institutions to replace traditional face-to-face teaching and learning during the COVID-19 outbreak. After the COVID-19 outbreak, many tertiary institutions, especially those running distance education and sandwich programmes, have adopted M-learning as a method of delivery.

In fashion departments in technical universities in Ghana, lecturers on part-time study leaves, and those engaged outside the university communities often use M-learning as a means to deliver their practical lessons to students. However, there have been complaints from the students that they were disadvantaged anytime their lecturers used M-learning as a mode of delivery of their practical lessons, especially pattern drafting, garment construction, and millinery and accessories. However, much research has not been done to ascertain the claims of the fashion design and textiles students in technical universities in Ghana. Most of the previous studies done on M-learning in tertiary institutions focused on English language, nursing, and other programmes [16;17;18;19;20;21;22]. Some previous research conducted discussed the benefits while neglecting the challenges. In addition, previous studies have found that using M-learning as a mode of lecture delivery provides educators with opportunities to reimagine teaching and learning, which could increase students' understanding [23].

## 2. Objectives of the Study

This study was guided by the following research objectives:

- i. To determine students' preferences for M-learning delivery modes in fashion design courses.
- ii. To compare the mean scores of students taught using the M-learning mode of delivery and students taught using the traditional face-to-face ICT mode.
- iii. To discuss the challenges fashion design lecturers and students face during teaching and learning using the M-learning mode of lecture delivery.

## 3. Research Questions

The study formulated the following research questions to guide objectives one and three:

- i. What mode of lecture delivery does fashion design students in technical universities in Ghana prefer for delivering pattern drafting, garment construction, and millinery/accessories?
- ii. What are the challenges fashion design students and lecturers faced during teaching and learning using the M-learning mode of lecture delivery?

## 4. Hypotheses

The following null hypotheses were developed to guide objective two of the study.

- i.  $H_{01}$ . There is no statistically significant post-test mean difference between students taught pattern drafting using M-learning and students taught using the face-to-face ICT mode of lecture delivery.
- ii.  $H_{02}$ . There is no statistically significant post-test mean difference between students taught garment construction using M-learning and students taught using the face-to-face ICT mode of lecture delivery.
- iii.  $H_{03}$ . There is no statistically significant post-test mean difference between students taught millinery and accessories using M-learning and students taught using the face-to-face ICT mode of lecture delivery.

## 5. Materials and Methods

This study employed a quasi-experimental pre-test/post-test between-subjects design. This design is appropriate for this study because it allows the researcher to observe the impact of an intervention or treatment on various groups of participants in a real academic environment [24]. The independent variables of the study were mobile learning modes of lecturer delivery, while the dependent variables were students' achievements. The study targeted first-year fashion design and textiles students who did not have a fashion background at the pre-tertiary level and lecturers teaching pattern drafting, garment construction, and millinery/accessories in three technical universities in Ghana. This study employed simple random, proportional, and purposive sampling techniques. Simple random sampling was used to select the students into the control and experimental groups. The proportional sampling was used to allot students to the control and experimental groups. The purposive sampling was employed to select lecturers teaching pattern drafting, garment construction, and millinery/accessories, which were the major fashion design practically oriented courses studied by fashion design students in technical universities in Ghana. It was also used to select students who did not have a fashion design and textiles

background at the pre-tertiary level. Thus, students who studied general arts, business, agricultural science, general science, music, etc.

The sample size for the study was 543 (3 lecturers & 540 students). Three experimental groups (EG1, EG2 & EG3) and three control groups (CG1, CG2 & CG3) were created in each of the three universities where the research was conducted. EG1 and CG1 were created for the pattern drafting course, EG2 and CG2 for garment construction, and EG3 and CG3 were created for millinery and accessories. Each EG and CG consisted of thirty (30) participants. Table 1 indicates the sample size for the study.

**Table 1:** Sample size

Group	Sample Size
EG 1 & CG1, EG2 & CG2, EG3 & CG3	180
EG 1 & CG1, EG2 & CG2, EG3 & CG3	180
EG 1 & CG1, EG2 & CG2, EG3 & CG3	180
Pattern drafting lecturer	1
Garment construction lecturer	1
Millinery & Accessories lecturer	1
<b>Total</b>	<b>543</b>

This study applied test instruments, a questionnaire, an interview guide, focus group discussions, and document analysis to collect quantitative and qualitative data from the participants. The test instrument, which consists of initial ability tests and students' achievement tests, was used to measure the achievements of students when M-learning and face-to-face ICT modes were used to deliver practical lectures to fashion design and textiles students in technical universities in Ghana. An interview guide was used to collect data from lecturers who taught the courses selected for the study, focus group discussions were used to collect data from some of the students in experimental groups, and document analysis was used to analyse the performance of the students after the two modes of delivery were used.

To ascertain students' achievements when lectures are delivered via M-learning and face-to-face ICT modes of delivery, the researchers created three experimental groups (EG1, EG2, & EG3) and three control groups (CG1, CG2, CG3, & CG4) in each technical university. Students in EG1 and CG1 were taught pattern drafting skills via M-learning mode of lecture delivery by lecturer one in each technical university, EG2 and CG2 were taught garment construction by lecturer two, EG3 and CG3 were taught millinery and accessories by lecturer three. This was done to control the lecturers' competencies. Each lecturer conducted a practical test after teaching via M-learning, and the results were recorded and analysed. After teaching the experimental and control groups via the M-learning mode, only the students in the experimental group were taught via the face-to-face ICT mode of lecture delivery. After exposing the students in experimental groups via the face-to-face mode of delivery, the researchers conducted face-to-face practical tests with the students in both the experimental groups and control groups. Each EG and CG were tested on the courses they were taught only.

To address the ethical concerns of the study, the data collection process began by obtaining permission from the Research Ethics Committees of the technical universities where this study was conducted. Data collection for this study was one month (a day for the questionnaire & 20 days for the interview). During the data collection, verbal consent of the respondents was sought by informing them about the purpose of the study and their right to choose to partake or not to partake in the study. Respondents were guaranteed their secrecy as the instruments did not require them to bear their names or registration numbers. Verbal consent was sought because the respondents were the students of the researchers of this paper. After seeking the consent of the respondents, the questionnaires were then administered to them, and data were collected for the study. Interviews were conducted with lecturers who taught the experimental and control groups, and five (5) students from each of the experimental groups were also engaged in focus group discussions by the researchers to ascertain the level of skills achievements after they were taught using both the M-learning and the face-to-face mode of delivery.

Before the interview, the researchers seek the consent of interviewees, describe the purpose of the study to them, and seek an appointment date and time. The questions on the interview guide were sent to the interviewee for their preparation. During the interview, permission was sought from the interviewee to record the conversation.

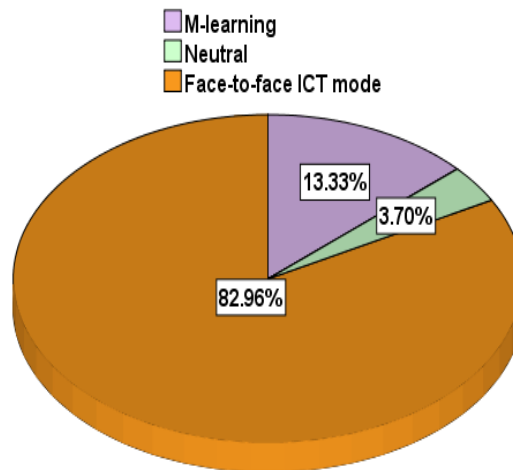
The quantitative data collected for this study were analysed using descriptive and inferential statistics. The descriptive statistics employed comprised percentages, mean, and standard deviation. The inferential statistics carried out were Analysis of variance (One-way ANOVA). The independent-samples one-way ANOVA was considered appropriate for the study because it allowed the comparison of mean scores across more than two independent groups to determine the presence of statistically significant differences among them.

## 6. Results and Discussions

## 6.1 Results

**Research question one: What mode of lecture delivery do fashion design students in technical universities in Ghana prefer for delivering pattern drafting, garment construction, and millinery/accessories?**

To answer research question one, students were asked to indicate whether they preferred the M-learning or the face-to-face mode of lecture delivery. The results are displayed in Figure 1.



**Fig. 1:** Mode of lecture delivery students prefer

The findings in Figure 1 evidently show that the majority, 448 (82.96%) of the fashion design students preferred the face-to-face ICT mode of lecture delivery. However, 72 (13.33%) preferred the M-learning while 20 (3.70%) have not decided on the mode of delivery they prefer.

**Objective two: To compare the mean scores of students taught using the M-learning mode of delivery and students taught using the face-to-face ICT mode**

### 61.1 Pre-test Results

#### *Descriptive Pre-test Results of Pattern Drafting*

To investigate students' performance when lectures are delivered via M-learning, students in EG1 and CG1 were taught pattern drafting skills via the M-learning mode of lecture delivery by Lecturer One. The lecturer conducted a practical test after teaching. The descriptive results of the pre-test are illustrated in Table 2.

**Table 2:** Pre-test Results of Pattern Drafting

Group	N	M	SD
CG1	180	1.1389	0.36255
EG1	180	1.1278	0.39594

Table 2 displays the average achievement scores for students in both EG1 and CG1. The results showed that students in CG1 performed better ( $M=1.1389$ ,  $SD=0.36255$ ) on the pre-test than students in EG1 ( $M=1.1278$ ,  $SD=0.39594$ ). The results show that the mean difference between the EG1 and CG1 was not significant. This indicates that the performance of the two groups was almost equal in the pre-test.

#### *Descriptive Pre-test Results of Garment Construction*

To ascertain students' achievement in garment construction when lecturers use the M-learning mode of lecture delivery, Lecturer Two taught EG2 and CG2 using the M-learning mode of delivery. The lecturer, after teaching, also conducted a practical test. The results of the test are shown in Table 3.

**Table 3:** Pre-test Results of Garment Construction

Group	N	M	SD
EG 2	180	1.0722	0.28027
CG2	180	1.0222	0.14782

In Table 3, the pre-test results revealed that the students in EG2 performed better ( $M = 1.0722$ ,  $SD = 0.28027$ ) than those in CG2 ( $M = 1.0222$ ,  $SD = 0.14782$ ). The findings indicate that the mean difference between the two groups was not

significant, which means the scores between EG2 and CG2 were virtually the same.

**Descriptive Pre-test Results of Millinery and Accessories**

To discover students' achievement in millinery and accessories when M-learning is used as a mode of lecture delivery, Lecturer Four taught EG3 and CG3 millinery and accessories and conducted a practical test. The results of the test are shown in Table 4.

**Table 4:** Pre-test Results of Millinery and Accessories

Group	N	M	SD
EG 3	180	1.2111	0.61625
CG3	180	1.0167	0.12838

Table 4 shows that students in EG3 received a marginally higher mean score (M = 1.2111, SD = 0.61625) in millinery and accessories pre-test than those in CG3, with a mean and standard deviation (M = 1.0167, SD = 0.12838) signifying a trivial difference in mean scores between EG3 and CG3.

**6.1.2 Post-test Results**

**Descriptive Post-test Results of Pattern Drafting**

To further address objective two, a posttest was administered to EG1 and CG1 after EG1 had received treatment by teaching them using the face-to-face ICT mode of lecture delivery by Lecturer One. The results of the post-test are shown in Table 5.

**Table 5:** Descriptive Post-test Results of Pattern Drafting

Group	N	M	SD
EG 1	180	3.4389	0.49764
CG1	180	1.0778	0.32504

Table 5 shows that students in EG1 performed better, with significantly higher mean scores (M = 3.4389, SD = 0.49764) than those in CG1 (M = 1.0778, SD = 0.32504) in the post-test. The results suggest that the use of face-to-face ICT mode for pattern drafting lecture delivery was more effective, and students had a better understanding, compared to the use of the M-learning mode of delivery.

**Post-test Hypothesis Results of Pattern Drafting**

To test hypothesis H0<sub>1</sub>, which states that there is no statistically significant post-test mean difference between students taught pattern drafting using M-learning and students taught using the face-to-face ICT mode of lecture delivery, analysis of variance (ANOVA) was conducted on post-test scores of EG1 and CG1. The results are shown in Table 6.

**Table 6:** ANOVA Pattern Drafting Post-Test Results

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	.852	1	.852	8.395	0.00
<b>Within Groups</b>	18.059	178	.101		
<b>Total</b>	<b>18.911</b>	<b>179</b>			

The results in Table 6 show that there was a significant mean difference in the student achievement in the post-test between the groups, F (178) = 8.395, p = 0.00, α = .05, where p < 0.05. Therefore, the hypothesis (H0<sub>1</sub>), which states that there is no statistically significant post-test mean difference between students taught pattern drafting using M-learning and students taught using the face-to-face ICT mode of lecture delivery, was rejected. The study therefore concluded that there was a statistically significant post-test mean difference between students taught pattern drafting using M-learning and students taught using the face-to-face ICT mode of lecture delivery.

**Descriptive Post-test Results of Garment Construction**

In order to find out students' achievement in garment construction, students in EG2 received treatment by teaching them using the face-to-face ICT mode of lecture delivery. The results of the post-test are displayed in Table 7.

**Table 7:** Descriptive Post-test Results of Garment Construction

Group	N	M	SD
EG 2	180	3.3667	0.54823
CG2	180	1.2444	0.52451

Table 7 shows that students in EG2 received a higher post-test mean score (M = 3.3667, SD = 0.54823) compared to those in CG2 (M = 1.2444, SD = 0.52451), demonstrating better performance by students in the EG2. The results suggest

that using the face-to-face ICT mode of lecture delivery was effective in improving students' performance compared to the use of M-learning.

### Post-test Hypothesis Results of Garment Construction

To test hypothesis H0<sub>2</sub>, which states that there is no statistically significant post-test mean difference between students taught garment construction using M-learning and students taught using the face-to-face ICT mode of lecture delivery, analysis of variance (ANOVA) was conducted on post-test scores of EG2 and CG2. The results are shown in Table 8.

**Table 8:** ANOVA Garment Construction Post-Test Results

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	7.114	2	3.557	14.943	0.000
<b>Within Groups</b>	42.131	177	.238		
<b>Total</b>	<b>49.244</b>	<b>179</b>			

Table 8 shows that there was a significant mean difference in the student achievement in the post-test between the groups,  $F(177) = 14.943$ ,  $p = 0.00$ ,  $\alpha = .05$ , where  $p < 0.05$ . The hypothesis (H0<sub>2</sub>), which states that there is no statistically significant post-test mean difference between students taught garment construction using M-learning and students taught using the face-to-face ICT mode of lecture delivery, was rejected. The study, therefore, concluded that there was a statistically significant post-test mean difference between students taught garment construction using M-learning and students taught using the face-to-face ICT mode of lecture delivery.

### Descriptive Post-Test Results of Millinery and Accessories

To examine students' achievement in millinery and accessories, students in EG3 were taught millinery and accessories using the face-to-face ICT mode of lecture delivery. Table 9 shows the descriptive analysis results.

**Table 9:** Descriptive analysis of post-test results of millinery and accessories

Group	N	M	SD
<b>EG 3</b>	180	3.3444	0.63705
<b>CG3</b>	180	1.0500	0.24277

Table 9 shows that there was a big mean difference between EG3 and CG3. It was evidenced that students in EG3 attained a significantly higher mean score ( $M = 3.3444$ ,  $SD = 0.63705$ ) compared to those in CG3 ( $M = 1.0500$ ,  $SD = 0.24277$ ), indicating that students in EG3 post-test results were far better than those in CG3. This clearly shows that the intervention used for EG3 was effective and had a positive effect on their post-test achievement.

### Post-test Hypothesis Results of Millinery and Accessories

To test hypothesis H0<sub>3</sub>, which states that there is no statistically significant post-test mean difference between students taught millinery and accessories using M-learning, and students taught using the face-to-face ICT mode of lecture delivery, analysis of variance (ANOVA) was conducted on post-test scores of EG3 and CG3. The results are shown in Table 10.

**Table 10:** ANOVA millinery and accessories post-test results

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	4.613	2	2.306	68.751	0.000
<b>Within Groups</b>	5.938	177	.034		
<b>Total</b>	<b>10.550</b>	<b>179</b>			

Table 10 shows that there was a significant mean difference in the student achievement in the post-test between the groups,  $F(177) = 68.751$ ,  $p = 0.00$ ,  $\alpha = .05$ , where  $p < 0.05$ . The hypothesis (H0<sub>3</sub>), which states that there is no statistically significant post-test mean difference between students taught millinery and accessories using M-learning and students taught using the face-to-face ICT mode of lecture delivery, was rejected. The study, therefore, concluded that there was a statistically significant post-test mean difference between students taught millinery and accessories using M-learning and students taught using the face-to-face ICT mode of lecture delivery.

## 6.2 Discussions

### Objective one: To determine students' preferences for M-learning delivery modes in fashion design courses.

The study discovered from the findings that the majority of fashion design students in technical universities in Ghana preferred the traditional face-to-face mode of lecture delivery over M-learning since they find it difficult to observe lecturers' demonstrations during M-learning modes of delivery.

**Objective Two: To compare the scores of students taught using the M-learning mode of delivery and students taught using the traditional face-to-face ICT mode.**

This study found that EG1, EG2, and EG3 got higher mean scores after they received treatment by teaching using the face-to-face ICT mode of lecture delivery. The higher mean scores obtained by EG1, EG2, and EG3 in the post-test show that face-to-face ICT mode of lecture delivery helps students understand better than using M-learning. It was revealed from the study that the face-to-face ICT lecture delivery enables students to see demonstrations clearly, ask questions, interact with the lecturers, and receive supervision from the lecturers.

Also, the low mean scores received by CG1, CG2, and CG3 in both the pre-test and post-test indicated that the M-learning was not effective for better student achievements in pattern drafting, garment construction, millinery and accessories, and other fashion design and textiles practical courses

**Objective Three: To discuss the challenges fashion design lecturers and students face during teaching and learning using the M-learning mode of lecture delivery.**

This study found that small screens of mobile learning devices were one of the major challenges fashion design students face during M-learning modes of delivery. It was found that due to the small screens of M-learning devices, students find it difficult to observe lecturers' demonstrations, such as sample illustrations, accurate measurement taking, pattern drafting, marker, cutting, and garment construction procedures. The inability of students to critically observe demonstration procedures via M-learning leads to poor absorption of fashion practical concepts and the failure of students to apply what they have learned on their own.

It was also found that M-learning restricts interactive learning activities such as the appreciation, criticism of students' practical works, and instant correction of students' practical works. This challenge makes it difficult for students to identify their mistakes and correct them to enable them to master the skills they have acquired from the lecturers.

The study revealed that another challenge students faced during M-learning was the network. It was found that lecturers and students frequently experience interrupted live demonstrations due to a bad network. These network interruptions negatively affect students' understanding of lessons and acquisition of skills. The network interruptions and lack of data make students absent themselves from lectures, unable to submit assignments, and even unable to take a live test. This generates disparity in learning opportunities and affects the general academic achievement of disadvantaged students.

The study revealed that M-learning devices' battery life is another challenge that lecturers and students face during M-learning. It was found that many students failed to follow the demonstrations from the beginning to the end because their M-learning devices' batteries died during the M-learning lectures. This challenge always affects students' attention and engagement, continuity of learning, and skills acquisition.

About the lecturers, it was found that M-learning devices' battery life challenges sometimes interrupt lesson delivery and assessment. This challenge led to inefficient M-learning demonstration and assessment.

The study also revealed that lecturers find it difficult to assess practical competencies of the students since they were not readily available to supervise students' pattern making, fabric handling, and turning, machine operations, dart manipulation, and garment construction accuracy.

## 7. Conclusions

Findings from the study indicate that in Ghana's technical universities, delivering lectures in person through ICT is more effective than M-learning for teaching practical fashion design and textiles courses. Most students preferred in-person instruction because it enables them to clearly observe demonstrations, engage actively with instructors, ask questions, and receive prompt supervision and feedback.

Further comparative analysis of students' academic performance showed that those taught through face-to-face ICT instruction achieved higher mean post-test scores than those instructed via M-learning. This suggests that practical, skill-oriented courses—such as pattern drafting, garment construction, millinery, and textiles production—require direct supervision and hands-on demonstrations to enhance comprehension and skill development.

The study finally concluded that mobile learning, while flexible and convenient, encounters substantial obstacles when applied to hands-on fashion education. These obstacles include the small screen sizes of mobile devices, unreliable network connectivity, limited interaction and supervision, battery life constraints, and difficulties in assessing students' practical competencies. These limitations undermine students' understanding, engagement, and overall academic achievement.

## 8. Recommendations

Practical courses in fashion design and textiles, including pattern drafting, garment construction, millinery, and accessories, ought to be primarily delivered using in-person ICT methods to facilitate adequate supervision, effective demonstrations, and comprehensive skill evaluations.

Educational institutions should allocate resources towards developing ICT-enabled studios and workshops that promote clear presentations of instructional demonstrations, allow for detailed oversight of students' practical tasks, and foster meaningful interactions between lecturers and students.

In contexts where mobile learning (M-learning) is implemented, institutions need to rectify its shortcomings by enhancing the visibility of device screens, ensuring reliable internet connectivity, and improving interactive features to better support students' learning experiences in practical courses.

### Conflicts of Interest Statement

The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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**Dr. Johnson Kofi Kassah** is a senior lecturer in the Department of Fashion Design and Textile, Ho Technical University, Volta Region, Ghana. His area of specialisation is fashion and textiles design. Dr. Kassah is from Dzodze, a town in the Ketu North Municipality of Ghana's Volta Region. He completed his basic education at Dzodze Central R. C. Junior Secondary School in the year 1997. He then proceeded to Dzodze-Penyi Secondary School and completed in the year 2000. After his secondary education, Dr. Kassah went to Takoradi Polytechnic to read HND Textiles and completed in the year 2005. After his National Service, Dr. Kassah went back to Takoradi Polytechnic to do a top-up and graduated in the year 2009. He then proceeded to the University of Education, Winneba, Kumasi campus, to pursue a Master of Technology Education in Fashion Design and Textiles Technology, which he completed in 2013. In 2016, Dr. Kassah was admitted to Kenyatta University, Nairobi, Kenya, to pursue a PhD in Art and Fashion Design Education. He completed his PhD programme successfully in the year 2019. Dr. Kassah taught vocational skills at St. Francis College of Education, Hohoe, Ghana, for seven (7) years. He also taught Textiles and General Knowledge in Arts in Zion College of West Africa, Anloga, and Adidome Senior High School, all in the Volta Region of Ghana. Dr. Kassah has published over twenty (20) scholarly works in credible journals.



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Dr. (Mrs.) Dymphna Bakker-Edoh is a Senior Lecturer in the Department of Fashion Design and Textiles at Koforidua Technical University, Eastern Region, Ghana. Her area of specialisation includes Fashion marketing, sustainable fashion, apparel technology, millinery, and accessories. She is an academician with a PhD in Fashion Design and Marketing from Kenyatta University, Nairobi, Kenya. She also holds a Master of Technology in Fashion and Textile Design and Technology and a Bachelor of Education from the University of Education, Winneba, Ghana. Dr. Bakker-Edoh continued her fashion training at Ho Polytechnic, Ho, Ghana, after her secondary education at St. Anne's Secondary/Technical School, Nuaso, Ghana, where the beginning of her fashion career began. Dr. Bakker-Edoh began her professional career as the Headmistress of St. George's Vocational Institute, Koforidua, where she served from 1989 to 2007. With over twenty-eight (28) years of experience in higher education, she has facilitated numerous training programs at the National

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**Patience Aku Dedume** is a seasoned lecturer in the Fashion Design and Textiles Department of Ho Technical University. She is known for her passion, precision, and commitment to excellence. She holds a Commonwealth Executive Master of Public Administration (CEMPA) from KNUST, Kumasi, and an MPhil in Clothing and Textiles from the University of Cape Coast. Her research interests include Fashion History, Production Management, Pattern and Garment Production, Product Development, and Fashion Entrepreneurship.