TES

TERTIARY EDUCATION SERIES

CONTENTS

RECONSIDERING MUSIC IN TEACHER EDUCATION: AN EMPIRICAL BASIS

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Abstract

*F*inding ways of improving teaching and learning is one of the key goals of research in education. Smartness in the classroom, is built on the ability of learners to be able to, first, retain and recall basic taught facts and subsequently, to apply them to given situations. This heightens the need for teachers to find ways of helping their learners to be able to retain and recall the basic facts that are required. Music has been one of the time-tested media for achieving this goal. This study sought to find further empirical proof to this can-do claim ascribed to music. A total of 40 undergraduate non-music majors were asked questions that required them to recollect facts that they had learnt when they were in their kindergartens and respective primary schools. The responses revealed that the participants still remembered the songs and some of the things that they learnt which were music-related in their kindergarten and primary schools more than the non-music related facts and activities. Furthermore, participants were able to recollect the names of the teachers who taught them or led them through the songs/musical activities and even remembered the particular activities that accompanied the songs. The implications of these findings for educational practices (particularly for tertiary education) in Ghana included the need for mounting compulsory music courses for teachers in training, as well as encouraging teachers on the field to make their teaching lively and link them with musical activities in order to help children (learners) retain and recall the taught facts.

Keywords: *Arousal, music, recall, retention, teaching.*

Introduction

Since Rauscher *et al.* (1993) reported that college students perform better on standardised tests of spatial abilities after listening to a Mozart sonata, the term *Mozart effect* has become a delicate scholarly moot-point among music educators, philosophers and psychologists *inter alios*. Summarising Rauscher *et al.* (1993, p.112) study that resulted in the *Mozart effect*, Schellenberg (2006) notes that, the researchers tested the spatial abilities of undergraduates after 10 minutes exposure to classical music, relaxation instructions, or silence. The tests were three subtests from the Stanford-Binet Intelligence Scale (Thorndike *et al.*, 1986), a widely used test of Intelligence Quotient (IQ).

Performance on the spatial tests proved to be better after listening to music than in the other two conditions. Because the musical piece was a recording composed by Mozart, the effect became known as the *Mozart effect*.

Quite a number of follow-up studies have been made with the aim of replicating the findings. Whereas some of these follow-up studies have done so successfully (Rauscher *et al.,* 1995; Chabris, 1999; Hetland, 2000; Rideout & Laubach, 1996; Rideout & Taylor, 1997; Rideout *et al.*, 1998), other studies found contrary results (Steele *et al.,* 1999; Steele, Dalla Bella, *et al.,* 1999; Stough *et al.,* 1994; Newman *et al.,* 1995). Some other researchers have experimented music by other composers (other than Mozart) to see the effect it has on

performance. Rideout *et al.* (1998)*,* report of an increase in performance after participants listened to music composed by Yanni, a New Age composer, but not after listening to minimalist music composed by Philip Glass (Rauscher *et al.,* 1995). Nantais and Schellenberg (1999) also found an improved performance after participants listened to a Schubert piece. In the words of Schellenberg (2006, p.115), "we replicated the *Mozart effect* and found a Schubert effect that was similar in magnitude". After listening to Albinoni, however, participants in the Nantais and Schellenberg (1999) study did not have any improved scores. What seems to be of particular interest here is that on one hand, a *Mozart effect* can be achieved by listening to other songs and not necessarily Mozarts'. This is captured by Schellenberg (2006, p.118) when he opines that "the claim of a specific causal link between listening to music composed by Mozart and spatial-temporal abilities is without merit". At least there is proof of a "Yanni effect" or a "Schubert effect" as well. Moreover, not all of Mozart's compositions have been used in such experiments, only 10 minutes of a single piece. On the other hand, not all musical compositions can lead to an improved performance in similar tasks as reported in the studies above (for example Albinoni's or Glass').

These series of seemingly contradictory findings presents a 'here-there-where' situation. Is there really a *Mozart effect*? Chabris (1999) did a meta-analysis of 16 studies and conceded that there may be a small intermittent effect, but that it probably arises from "enjoyment arousal" induced by music. He relates the improved performance to the positive mood that may have been aroused by the music in the participants. Thus, the emphasis here is not on the music per se, but on the fact that a positive mood leads on to improved performance. That presupposes that any stimulus that can incite a positive mood can also serve the purpose. Supporting the mood-arousal stance, Schellenberg (2006, p.118) avows that "specific characteristics of music affect arousal and mood, which, in turn, affect performance on cognitive tasks". Schellenberg's stance provides palpable grounds for explaining why some of the musical compositions mentioned above could not achieve the said *Mozart effect*. In his own words, he notes:

> according to the *arousal and mood hypothesis*, the 'special link' between music composed by Mozart and spatial (or spatial-temporal) abilities is actually just one example of a stimulus that affects arousal and mood, which, in turn, affects performance on a wide variety of tests. The main advantage of this perspective is that it explains the seemingly mysterious *Mozart effect* in a straightforward manner with well-established psychological findings.

The claim that music incites mood and emotion has been firmly established *ipso facto*.

The Problem

A plethora of studies (Krumhansl, 1997; Gabrielsson, 2001; Peretz, 2001; Schmidt & Trainor, 2001; Sloboda & Juslin, 2001) speak to a known reliable effect of music on the emotional states of listeners. It is important to note that, the mood or emotion that a piece of music ignites can be positive or negative (Aristotle, 1984) and may subsequently affect the behavior of the individual accordingly. Thus far, the studies that report a *Mozart effect* allude to a positive mood that is aroused by the Mozart piece. Compared to the Albinoni's Adagio, Mozart's sonata is an up-tempo, happy sounding piece in a major key. Albinoni's Adagio is a slow tempo, sad sounding piece in a minor key that is often played at funerals. One would naturally not expect the same levels and directions of arousal among listeners. Thus, Schellenberg (2006, pp. 117–118) observed among the participants in his study that "when there was a reliable difference in arousal and in mood as a consequence of music listening, there was also a reliable difference on one of the IQ subtests. When there was no difference in arousal, there was no evidence of a *Mozart effect*". Figure 1 gives further clarity to the relationship between Music, mood-arousal and subsequent performance.
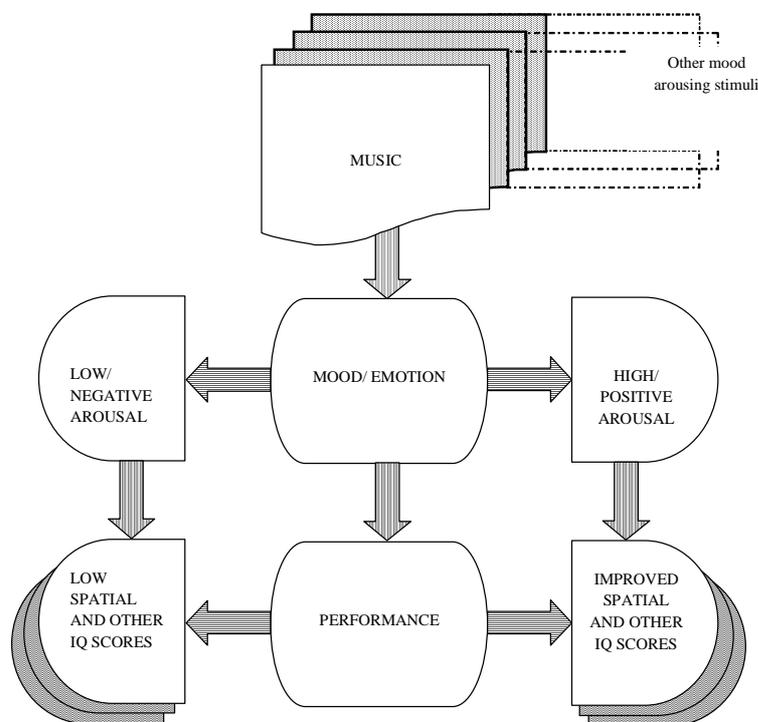

Figure 1: Arousal and Mood Hypothesis Model

In the model (figure 1), music is on the foreground of other potential mood-arousing stimuli (which do not form part of this present study). The point here is that, according to the mood-arousal hypothesis, other conditions that can arouse positive moods in participants may also achieve the same so called *Mozart effect*. Schellenberg (2006) for example found that performance (of subjects in his study) varied reliably as a function of preference. According to him, "… those who preferred Mozart did better on the … test after listening to Mozart. Those who preferred the story did better after listening to the story." This finds support in Sloboda (1999) who also reports of an increased and heightened emotional state among listeners when they exercised some control over the music they listened to. In his own words:

> … music increased emotional state towards greater positivity (e.g. more happy), greater arousal (e.g. more alert), and greater present-minded-ness (e.g. less bored). But what seemed of particular significance to us is that mood change was greatest when participants exercised choice over the music they were hearing. Music maximally enhances well-being when participants exercise some degree of autonomy and self-determination in the type of music they hear.

The effect of preference may also help in explaining why some music could work (aid in spatial-temporal scores) and

others could not. The background and preferences of the participants need to be carefully considered in trying to replicate results on the *Mozart effect*. If there are listeners who are not fond of Mozart, it is doubtful the same results may be achieved with them, they might probably get a "Marley effect" if they are reggae fans or a "Reeves effect" if they are conventional country music fans. Spatial-temporal skills is also on the foreground of other skills that mood-arousal may affect positively or negatively.

Purpose of the Study

It is clear from the introduction that different characteristics that different kinds of music possess lead towards different ends among listeners. There are indeed, many non-musical values that music serves as a catalyst in achieving. The purpose of this study was to explore the extent to which participation in music aids retention and recall of information. According to Sloboda (1999), music can provide a powerful reminder of earlier events or periods in our lives, and the significant people or places that figured in them, particularly when these life events were strongly emotional. This study sought empirical support for this assertion in order to make recommendations for music educational practices, particularly in Ghana.

In line with the above purpose, the study sought to answer the following questions:

1. To what extent do participants remember things they learnt

when they were in their Kindergarten and Primary schools?

2. What is the difference in the ability of participants to recall information taught through songs and those taught without songs?

Participants

The participants in this study consisted of 40 undergraduate university students selected through disproportional stratified random sampling. The strata used were those of gender and level. Subsequently, there were 20 females and 20 males — these consisted of 10 respondents from each of the four undergraduate levels. The table 1 gives the distribution of the ages of the respondents in this study. Majority of the respondents (52.5%) were between the ages of 26 and 30. This was followed by 10 respondents (25%) who were between the ages of 21 and 25. Whereas none of the respondents was below the age of 21, nine of them were above 30 years.

TABLE 1

Ages of Respondents

Ages	Frequency	Percentage
21–25	10	25.0
26–30	21	52.5
31–35	3	7.5
36 and above	6	15.0
Total	40	100.0

Procedure

The participants in the study were made to respond to a direct questionnaire made up of close and open-ended questions. The questions basically required participants to recall some facts they had learnt in their Kindergarten and Primary schools. This meant they were required to remember things they had learnt in at least seven years. Some of the questions required them to recall things they had learnt through music or with which music was associated. Other questions required them to remember topics in English and Mathematics which they had learnt in those same classes which had no musical connections. A comparison was then made to find out if there was any difference in the ability of participants to recall those things they learnt through or in connection with music and those they did not. Any observed difference or otherwise was meant to help answer the underlying research questions and fulfill the purpose of the study. All the participants in the study have, since their Kindergarten and Primary schools, gone through at least three years of Junior High School and another three years of Senior High School. Some of them have even had a three year professional training after graduating from Senior High School, and others had stayed home for a year or two after Senior High School before proceeding to the University. The assumption is that the numerous experiences they had acquired at other places after Kindergarten and Primary school would have made it a little more difficult to recall some of the stuff they had learnt at these places.

Results

The data collected revealed that all the respondents remembered at least the titles of two songs which they had learnt either in Kindergarten or Primary school. A list of the songs that participants mentioned is displayed in Appendix A. All the participants were able to tell the themes and subject matter of the songs they mentioned, as well as the particular classes where these songs were learnt. Interestingly, 35 out of the 40 respondents (87.5%) were able to recall the names of the teachers who taught the respective songs and were also able to recall the exact activities that were performed to accompany the singing. Table 2 provides details of the exact primary or class levels where participants learnt their respective songs.

TABLE 2

Class/Stage where Songs were Learnt

Class/Stage	Frequency	Percentage
KG	9	22.5
Class 1	10	25.0
Class 2	7	17.5
Class 3	5	12.5
Class 4	5	12.5
Class 6	4	10.0
Total	40	100.0

It is clear from the Table 2 that the frequency of songs decreased from class one to class six. Participants recalled most songs in their Kindergarten and Class one than in the subsequent levels. This could have been because there were much more singing in Kindergarten and Primary one and the singing decreased as they progressed to the higher classes.

Apart from the titles and themes of songs, participants were also asked to recall topics they learnt in English and Mathematics (two core subjects) at the same stages or classes where the songs were learnt. Between Mathematics and English, participants in this study were more able to recall specific topics they learnt in English (as a subject) than in Mathematics. Only 12 of the respondents (30%) remembered topics in Mathematics. These topics were however, not specific. They were very broad topics that were taught in Mathematics from Kindergarten to the University. These topics included addition, subtraction, multiplication, and division. Participants could not remember specific lesson-based sub-topics. Although the frequency of topics in the English subject increased among participants (from 30% in Mathematics to 55% in English), the nature of the topics mentioned were similar to the case of Mathematics. They were broad spiral English topics such as: nouns, adverbs, verbs, reading, writing and the like. There were however, some specific lesson-based topics that were mentioned here. These include: alphabets, story-telling, rhymes, say and do, and poems.

With the exception of one participant who did not answer the question regarding the extent to which music helps in retention of information and recall, the remaining 39 showed their strong agreement. Some of their reasons for such consent are displayed in Table 3.

TABLE 3

Reasons Why Music Helps in Retention and Recall of Information

Reasons given by Participants
Anytime you remember the song, you remember what you were taught
Anytime you sing these songs it brings back past memories
As one sings a particular song the person remembers the one who taught him or her
As the songs go with the gestures, one remembers what was taught
At the early age, children learn well with songs and actions
Because of the choice of words in the music
Because pupils enjoy taking part in singing, it helps them to retain the things they learn
Because the songs are always sung, they are not easily forgotten
I still remember what I learnt
It easily brings to mind what has been taught
It helps to remember what you have been taught for a long time
It helps you to recollect things
It makes learning interesting
Music helps in meaning derivation
Music helps in remembering events
Music helps in retention and remembrance
Remembering those songs help in recalling lessons taught
Songs learnt help in retrieving past information
The joy and happiness gained from the songs enable me to sing it over and over
The lyrics send a message
The song still stick in your head
There are some songs that make you remember what you were taught at that stage
There were information in the songs that are even helping today

Discussion

As evident in the results above, participants in this study were able to recall music and music-related activities that they had learnt many years ago more than they did in English or Mathematics. Thus, music indeed aids in retention and recall of information. This finds support in a number of studies. Wallace (1994)

for example, conducted four experiments and found evidence that supports the hypothesis that music facilitates the learning and recall of text. He argued that familiar melodies can provide a great deal of information about the features of text. These features include the length of the text, the number of syllables, how many syllables are stressed, and the order of the words and phrases. In addition, familiar melodies provide a framework for reconstruction of the text. Music also provides sequential information and an order of encoding and recalling so that the likelihood of skipping or misplacing a portion of the text is decreased (Wallace, 1994). Wallace thus, establishes the finding in this study that music does aid retention and recall.

In explaining exactly how music is able to achieve this purpose, Rainey and Larsen (2002) point out that music appears to meet the requirements of a good mnemonic device. The rhythm and melody of a familiar song provide a structure for learning new information, a distinctive memory record, and effective retrieval cues (Wallace, 1994; Rainey & Larson, 2002). This is indeed justified in the reasons that participants gave in Table 3 in support of their stance that music helped them to retain and recall useful information.

To verify the stance of Wallace (1994), Rainey and Larsen (2002) also conducted two experiments testing the general hypotheses that music can act as a successful mnemonic device. The first experiment looked at the specific hypothesis that participants would learn a list of unconnected text in fewer trials when the text was set to a familiar melody compared to when they learnt the list as prose. Rainey and Larsen (2002) found that there was no difference between the two conditions; the participants in both the sung and the prose group learnt the list in the same amount of time. The second experiment considered how much of the text was retained in long-term memory when the text was learnt as a song a prose. Participants who initially learnt the list set to a familiar melody took fewer trials to re-learn the list than those who learnt the list as prose. In fact, there were twelve participants (6.6%) in the sung conditions who recalled the list perfectly after one week while there were only five (2.8%) in the prose condition who could recall the entire list. Rainey and Larson (2002) concluded that the musical presentation of the text resulted in better long-term memory than the prose presentation and that familiar melodies may serve as a retrieval cue.

The findings of Rainey and Larsen (2002) do not only support the argument that music does enhance the recall of information, but it also serves to help explain why perhaps, participants in the present study were also able to recall more topics in English than in Mathematics. This is because English deals a lot with text and Mathematics with numbers. Rainey and Larsen go on to give a reason as to why music increases the learning and recall of text. They postulate that memories for music and lyrics may be partially integrated. Research has shown that melody and text are integrated

in memory, even when nonsense syllables are used (Serafine, Crowder, & Repp, 1984; Serafine, Davidson, Crowder, & Repp, 1986). Other research has shown that music and text may cue each other, which could be due to physical interactions or association by contiguity (Crowder, Serafine, & Repp, 1990). Samson and Zatorre (1991) examined dual encoding for songs in participants with lesions in the right or left temporal lobe. Specifically, they investigated the neural mechanisms underlying multiple encoding of songs. They found that the left temporal lobe is mostly involved in the recognition of text whereas both the right and left temporal lobes are involved in the recognition of melodies (Samson & Zatorre, 1991). The different role for each lobe provides evidence for the use of dual memory codes and suggests that songs can be encoded in different ways (Samson & Zatorre, 1991). This dual-coding facilitates easier recall because the text can cue the melody and vice versa. However, there is also evidence that tunes and text are processed independently. Some studies have shown that participants divide their attention between lyrics and tunes, but the processes do not compete for the same pool of resources (Bonnel, Faita, Peretz, & Besson, 2001). This suggests that songs do not form a single memory representation that has two dimensions (Bonnel *et al.,* 2001). Instead, songs are composed of two separate memory representations that have one dimension each (Bonnel *et al*., 2001).

Lending further explanation to the relationship between music and recall of text, it has also been suggested that the increase in memory when text is set to melodies may actually be due to presentation rate (Kilgour *et al.,* 2000). Kilgour *et al.* (2000) addressed the effect of musical training and presentation rate on recall when text was set to melody in three experiments. In the first experiment, they found that recall was better for the sung condition than the spoken condition. However, the level of music training did not affect recall. Kilgour *et al*. (2000) proposed that the differences in recall between spoken and sung presentations might actually be due to presentation rate. When singing, the rate of presentation may have been slower than when spoken. In the second and third experiments, they tested the effect of presentation rate on recall. In the second experiment, the duration of the sung and spoken conditions was equated. The results showed the opposite of their first experiment; the participants in the spoken condition recalled more of the material than the participants in the sung condition. This supported the hypothesis that it is the slower tempo when the material was sung that facilitated recall. The third experiment examined the effect of presentation rate more closely by adding a slow tempo condition, 30 beats per minute, and a fast tempo condition, 70 beats per minute. Once again, there was an advantage, though small, for the spoken materials. These results suggest that the advantage of sung over spoken presentations reported in previous studies (e.g., Wallace, 1994) may actually reflect an artifact of different presentation rates for sung and spoken conditions because the sung condition may be presented at a

slower tempo than the spoken conditions (Kilgour *et al.,* 2000). This slower tempo allows more time to process the presented material, leading to better memory.

Kilgour *et al.* (2000) add a new tilt to the preceding argument. They emphasise that it is not just the music, but the nature of the music and the presentation as well. It is not all songs that the participants in this study have learnt that they were able to recall. Those kinds of songs whose syntax is understood in relation to the cultural background of the learner are easier to understand and recall. Sloboda and Parker (1985) explain this further:

> … music is represented in the mind in terms of the structures and regularities that it contains. When such structures cannot be detected, it is impossible for people to process and store the information efficiently. The music of a culture has a familiar syntax, and when this is missing, as for example in some forms of atonal music, processing is severely disrupted.

When people are able to process the music they listen to and engage in, they enjoy it better. The enjoyment leads on to their readiness to sing or listen to it often. The frequency of exposure leads on to preference, which incites positive mood and subsequently, enhance better performance.

Conclusion

Drawing any conclusions from the discussion of the findings in this study in relation to the preset research questions, there is enough evidence that music or engagement in singing in school enhances retention and factual recall of vital information to a very large extent. Information that is encoded in familiar songs (which syntax is understood within the culture of the learner) act as important mnemonic devices that help learners to recall this useful information even after a very long time.

Reviewed and extant literature supports the existence of a *Mozart effect*. However, this effect is based on the mood-arousal hypothesis. A careful selection of songs for listening or performance can arouse the necessary emotions that are relevant for high achievement in a fruitful venture.

Implications for Music Education

The purpose of teaching is to get learners to identify and understand important information which they can remember and apply to different situations. To this end, the findings in this study are very important. The findings support other studies that posit that music helps in the retention and recall of important information even after a long time.

For every lesson (irrespective of subject) there are facts that the teacher will want the learners to acquire and retain. One best way to achieve this is to encode these facts in music. As evidence to this, I composed a song for a basic six lesson on rivers in Ghana (the composition is attached in Appendix B). The order in which the names of some of the major rivers in Ghana were mentioned

in the original text was mixed up in the song. After the lesson, the evaluation revealed that although some students got many other questions wrong, not a single student got the question which required them to mention the names of four rivers in Ghana wrong. The only problem that some of the students found with that particular question was with the spelling of some of the rivers. What is more interesting, the students mentioned the names of the four rivers in the order in which the rivers were mentioned in the song (and not in the order in which they were mentioned in the original text). The only logical explanation is that, the students sung the song in their heads as they answered that particular question and wrote down the rivers as they appeared in the song.

The implication of this is that, if we want our students to remember what they are taught, then (particularly at the lower levels) the core points in the lesson must be put into song. This means that every teacher who teaches in the basic school must take some lessons in music if this purpose can be achieved. Music education must therefore, be made a compulsory part of tertiary institutions that specialise in the training of teachers in Ghana.

At the basic level, children must be given the opportunity to engage in musical activities. This stands to serve a dual purpose: as a means of musical training (which is important in developing the musical intelligence of pupils) and as a means of achieving other beneficial non-musical ends like ability to recall what they are taught, experience profound emotional feelings via listening to music (which can engender positive moods and lead on to positive outcomes) and achieving all those other benefits claimed to be gained from active engagement with music. Thus, in sum Abeles *et al.* (1995, p.278), writes:

> … every child should have a general, broad musical experience before embarking on his or her choice of specialised activities. Without it, most students would not be able to make intelligent choices.

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APPENDIX A

Titles of Songs Mentioned by Participants

A lion, a lion, a lion has a tail	Twinkle twinkle little star
Akatekyira boakye mo a nse mo ne ahye nafu totwe	War no more
I'm going fishing	We are together again
And I stand up and I sit down	You cannot go to Heaven without salvation
Anhwe w'akyir	A, B, C, Jesus is my friend
Baa, baa, black sheep	Aseda ye onyame ne dea
Bankye, bankye	Aso sika dama
Bodambo ekor osi edan do	Awurade ye kese
Da n'ase	Bankye, bankye
Ding dong merrily on high	Cast your burdens
Good morning Jesus, good morning Lord	Gentle Jesus make a might
Goose, goose, gander	I have one head
He is Lord	Jesus is my friend
I see the moon	John the piper's son
I will make you fishers of men	Me maame eee rice water
I wish i were a little fish	My grandfather's clock
Jesus love the little children	Nursery ye mede o meko
Jesus loves me	O for a thousand tongues to sing
Joy to the world the Lord is come	Odo Nyankopon
Jump, jump, jump together	Rain, rain, go away
Oman Ghana ba	Sitting on a sun
One, Two, Bugle my shoe	Stand up, stand up for Jesus
Something good is going to happen	The Lord will bless someone
The little man	Twinkle, twinkle, little star
To God be the glory	We are marching to our classes
	Dabodabo wo ko he

Appendix A (*cont'd*)

Father I love you	Sansankroma
Fox, fox, fox	Se osram pae a
I am a little tea pot	There is a fire on the mountain
I saw three ships	Two little black birds
I see the moon	Apotro miensa ko baabi
If you look at me	Demain matin, demain soir
Jack and Jill	Eto ne paya
Joy like a river	Holy, holy, holy, Lord God Almighty
Master speak thy servant hearth	Kpode devi ko mega nye
My Lord what a morning	Once I saw a fish alive
Oh! Happy day	Once I saw a little bird

APPENDIX B

SOME RIVERS OF GHANA

E.D. OTCHERE

A STUDY OF OPPORTUNITIES FOR INDUSTRIAL ATTACHMENT FOR FASHION DESIGN AND TEXTILES, 2009–2013

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Abstract

*T*his paper presents an insight into students' industrial attachment experiences in fashion design and textiles companies over a 5-year time frame. The main objective was to identify and analyse the issues and problems arising from a new arrangement of putting students in industry for an entire semester, and look at the way forward for the industrial attachment (IA) programme as a key component of the Competency-Based Fashion, Design and Textiles Course. The study is based on the Fashion Design and Textiles Programme of Accra Polytechnic.

Majority of the students have had a lot of exposure since they were put directly into production to meet customer demands, sometimes to the detriment of their training needs. There were no clear-cut guidelines for training students and most students would rather not return to the industrial attachment companies as permanent workers. Some problems identified were monotony of work, extended working hours, no transport allowance and lack of regular industrial visits from the school.

Keywords: *evaluation; industrial attachment; fashion design; polytechnic; employable skills.*

Introduction

In 2003, Ghana was included as a beneficiary of the Netherlands Programme for Institutional Strengthening of Post Secondary and Educational and Training Capacity (NPT-Project). Polytechnic education was identified as an integral part of the programme with Fashion Design and Textiles (FDT) Studies as one of the priority areas for consideration. Subsequently, the Department of Fashion Design and Textiles of Accra Polytechnic was selected as an entity for the implementation of the Capacity Building Programme. As part of the programme, a new Competency Based Training (CBT) curriculum was developed and implemented in August, 2007 and one of its main goals was the creation of a strong link between education and industry. This emphasis was as a result of the need to respond to the changing skills demand of the workforce as revealed by a number of government publications and research reports (COTVET, 2012; Tamakloe, 2011). Students of Polytechnics are considered to become middle-level managers and therefore it is important for them to gain theoretical and practical knowledge both in school and industry.

The core of the CBT approach in this programme is concerned with creating strong links with industry and providing rich and challenging learning assignments through which students learn to develop their ability to perform professionally in design, production and distribution in line with the Fashion and Textiles Industry. It also aims at creating a new impulse for the industry and stimulates economic growth. In the end, graduates would find more meaningful employment and support the development of the nation as a whole (Fashion Design and Textiles Department, 2007). CBT programmes are industry and demand-driven, based on strong consultation with all major stakeholders

(COTVET, 2011). Gondwe & Walenkamp (2011) recommended the need to improve the applied sciences curricula, teaching methodologies, infrastructure and staff training by linking professional education institutions and the labour market to raise the training skills of employers during apprenticeships and internships.

Students, school and industry gain a lot of benefits from the practical experiences incorporated into the CBT FDT curriculum. These three parties however, see the benefits differently, and have different needs and expectations which can affect the 'quality' of a successful industrial attachment programme. Students deserve a well-organised industrial attachment (IA) programme so they can acquire professional skills while at the same time offering industry effective ways to train. Auburn (2007) indicated that one of the main difficulties for evaluating supervised work experience has been the lack of an accepted model. Again, Bullock, K., Gould, V., Hejmadi, M., and Lock, G. (2009), mentioned that procedures for placing, monitoring and accrediting students are disparate and idiosyncratic. In order to attract as many students as possible to start their career in FDT and increase the retention rate of same in industry, both the school and industry should collaborate closely to develop a well-organised quality IA programme.

This paper presents an insight into students' IA experiences in the Fashion Design and Textiles Industry over a 5-year time frame. Over this period, students have spent the second semester of the second year in industry for period of four (4) to six (6) months, after a 5-week in-house IA at the end of the first year. This is the first of its kind ever in the history of polytechnic education in Ghana, with four other polytechnics who offer the FDT course following such footsteps. The main objective was to identify and analyse the issues and problems arising from this new arrangement (paradigm) and look at the way forward for the IA programme as a key component of the CBT Fashion, Design and Textiles Course.

Review of Related Literature

Industrial attachment is a structured, credit-bearing work experience in a professional work setting during which the student applies and acquires knowledge and skills. It involves the application of learned skills in an organisation related to the students' major. An IA should challenge the student to examine the values of the organisation involved, and to assess the student's education as it relates to the programme (Strathmore, 2010). An internship, on the other hand, is a method of on-the-job training for white-collar and professional careers. Internships for professional careers are similar to apprenticeships for trade and vocational jobs. Students can also use an internship to determine if they are interested in a particular career, create a network of contacts, or gain school credit. Some interns find permanent, paid employment with the organisations with which they interned. This can be of

significant benefit to the employer as experienced interns often need little or no training when they begin regular employment (Wikipedia, 2013).

Different authors have used different names and meanings for the term industrial attachment. However, the term internship is most commonly used and the two (industrial attachment and internship) are mostly used interchangeably especially in Ghana. For instance, Lam & Ching (2007) cited Pauze *et al.* (1989), Davies (1990), and Fox (2001) to have used the word internship. Davies (1990) stated that internship is a kind of experiential learning where students take the opportunity to apply learned theories from schools in the real world situation, providing an opportunity for students to integrate and consolidate thinking and action. According to Busby and Gibson (2010), "higher education internships", "placements" and "the practicum" are a variety of terms for what is, essentially, a period of employment in industry. Other terms used are "work experience" and "cooperative education" (Busby, 2003: Inui, Wheeler & Lankford, 2006: Lesley & Richardson, 2000: Waryszak, 1997). McMahon & Quinn (1995) referred to IA as "supervised work experience" (SWE) explaining that students are under special guidelines and attention during their internship instead of working alone by themselves in industry, while COTVET (2012) used the term "Workplace Experience Learning (WEL)" and explained it to mean the involvement of learners in a structured workplace learning during which they are expected

to demonstrate their learning of a designated set of skills and competencies related to the programme. It is a crucial component in CBT, assigned a credit value and contributes to the award of qualification. This means that all learners have to do the IA module to get a qualification, thus putting a lot of pressure on industry to provide work experience places for students (COTVET, 2012).

Industrial attachment is recognised world-wide as an indispensable component of Polytechnic education. It offers students the opportunity to acquire work-oriented skills, general knowledge, attitudes or behaviour necessary for effective work performance. The students are expected to develop their potentials to the fullest in order to contribute meaningfully to nation building (Akortsu, 2002). There is a widely held belief within the higher education community that supervised work experience produces highly positive outcomes in terms of graduates who have acquired a range of attributes related to employability (Auburn, 2007). Walmsley *et al.* (2006) cited Busby (2003) who mentioned that placements should be highly valued as they undoubtedly help inculcate vocationally relevant skills and knowledge. Little & Harvey (2006); Lucas & Tang (2007) also noted improvements in personal transferable skills, such as teamwork, communication and learning skills, as being among the main benefits of placements. In addition, Busby and Gibson (2010) cited Tribe (2002) who declared that the typical placement helps students to come to terms with

understanding and developing critical and ethical awareness.

Internships may last as little as four (4) weeks in duration or as long as 12 to 14 months (Busby, Brunt & Baber, 1997) and can be domestic or internationally-based (Busby and Gibson, 2010).

Modey (2013), quoted Dr. Jakpasu in the June 17, 2013 issue of the *Daily Graphic* to have advocated for a full year practical training for Polytechnic students in Ghana to enable them master their skills and also be exposed to a wide array of equipment available in industry. He suggested that the National Service period should be used as an IA period when all Polytechnic graduates are placed in relevant industries to acquaint themselves with the realities of the job market. (Modey, 2013)

McMahon & Quinn (1995) identified three parties involved in the IA relationship; the industrial tutor, who is the school representative, the student and the employer. The industrial tutor is a planner, troubleshooter, evaluator, team leader, buck holder and mediator, as well as a people and resource manager. He or she is responsible for the tasks of finding suitable placements and the preparation, monitoring, assessment and debriefing of students. Also, in recent years there have been considerable developments in the monitoring and assessment of IA students. These ranged from the compilation of detailed reports, based on highly structured lists of elements of competences, to learning contracts. Irrespective of the order in which benefits are ranked, it would appear that placement provides students with the kinds of opportunity which the classroom can never replicate, although students often report negative experiences on placements.

Cook, Parker & Pettijohn (2004) recommended a framework for implementing a successful internship programme indicating that interns should: do between seven to fifteen work hours per week, be paid for working, receive a pass or fail grade rather than a letter grade, have direct supervision during internship, and an internship coordinator be assigned to provide both students and business with information.

Research Method

The research approach for this study was mainly qualitative and evaluative. This was considered appropriate to generate a holistic picture and depth of understanding rather than a numeric analysis of data. It also involved a systematic collection of evidence on the worth of the IA programme as organised by the Department of Fashion Design and Textile Studies. The data was collected over a 5-year period from 2009 to 2013.

A focus group discussion was conducted involving students, teachers, Head of Department, Departmental Liaison Coordinator (ILC) and company supervisors to discuss issues that arose from IA placement. This was done at the end of years 2011, 2012 and 2013 after the idea of evaluating the IA programme was conceived in year 2010. This method afforded respondents the opportunity to

freely express themselves on issues relevant to the research. It also permitted further probing for detailed information.

A quantitative survey was also conducted to obtain relevant information on students who had been on industrial attachment in the 5 different academics years under study. This was done using documentary analysis of students' attachment plans and attachment reports before and after the IA respectively, assessment and evaluation forms of students submitted by supervisors in industry and yearly evaluation reports of the general conduct of the IA prepared by the departmental liaison coordinator. This was useful in generating a complete set of data to evaluate the IA programme. Data was evaluated and conclusions were made using mainly narrative descriptions and interpretations.

Findings and Discussions

The Current State of Industrial Attachment Practice

The new Competency-Based Fashion, Design and Textiles curriculum requires a student to do a total of 25 weeks or more of Industrial Attachment (IA). This is made up two phases. These are:

i. *An in-house industrial attachment at the end of the 1st year of study, during vacation*
  After the first year of study, students acquire basic production and design skills, knowledge and attitudes. It is therefore important for students to

apply these new capacities in an authentic context in close relationship with the world of work. This creates the opportunity for the students to transfer what they have learnt into a realistic setting in the production line created in the new Fashion Design Department Building of Accra Polytechnic. Students are made to work on assignments from partners in the industry for example, students work on the production of garments for a company and schools, etc. The main focus during this in-house industrial placement is on production skills, knowledge and attitudes.

ii. *An out-house industrial attachment in the second semester of the second year*
  In the second semester of the second year, the students go out for an industrial attachment for a period of 6 months (initially for 4 months) which bears nine (9) credit hours. The departmental and institutional liaison officer offers the students support in searching for a placement that is most relevant for the personal and professional growth of the student and for their specialisation in the third year.

Preparation for the IA is done a semester before the IA semester that is, the first semester of the second year. Students are guided to:

a.　Select one of three Specialisations

The FDT programme is divided into three specialisations in the final year. Students are therefore placed in industry based on their various specialisations. The specialisations are:

- Fashion Designing — Designing, sketching and illustration of clothing, textiles and accessories.

- Fashion Production — The production of clothing and accessories.

- Textile Design/Production — Designing and production of textiles.

b.   Present portfolio and attachment plan to be taken to industry and are assessed by the teaching staff.

c.   Go through orientation by representatives from industry, lecturers, departmental head and liaison coordinator. They are also encouraged to seek information from past students who have successfully completed their IA with the company they intend to get attached to.

d.   Be placed in industry based on their attachment plans, interests and areas of residence.

e.   Take IA documents like introductory letters, assessment forms, log books and students' attachment guide to start the IA.

f.   Go through a 6 month IA training.

g.   Present log books and typed reports to the Department Liaison Coordinator.

h.   Supervisors in industry present assessments on students and also fill evaluation forms. Students are graded competent or not yet competent after all assessment documents are collated.

Assessments

The attachment supervisor from the company and the Department Liaison Coordinator together evaluate the attachment period.

i.   Assessment reports on students' activities and performance on jobs allocated in industry constitutes *50%* of final assessment.

ii.   Industrial visits to assess students work in industry constitute *10%* of final assessment.

iii.   Students take a one week assessment at the department's production unit. This constitutes *15%* of final assessment.

iv.   Students present a written report and practical portfolio. This constitutes *15%* of final assessment.

v.   Students also give an oral report of work in industry when they return to school. This constitutes *10%* of final assessment.

TABLE 1

Specialisation/Sex of Students

Specialisation	Sex	2009		2010		2011		2012		2013		Total	%	% Total
FASHION DESIGN	M	6		6		0		4		3		19	5	
			14%		23%		21%		19%		24%			20%
	F	5		7		16		13		19		60	15	
FASHION PRODUCTION	M	2		0		4		5		8		19	5	
			45%		54%		42%		54%		44%			48%
	F	34		30		29		44		31		168	43	
TEXTILES DESIGN/ PRODUCTION	M	9		6		8		9		13		45	11	
			41%		23%		37%		27%		32%			32%
	F	24		7		21		15		16		83	21	
TOTALS		80		56		78		90		90		394	100	

Total = 394, Female = 311(79%) and Male = 83(21%)

Table 1 shows that among 394 student respondents 79% were female and 21% were male. This is consistent with the general phenomenon that FDT study is a female dominated profession.

The majority of students (48%) specialised in Fashion Production, followed by Textiles (32%) and Fashion Design (20%). Fashion Design as a sole discipline is not common in Ghana since very few companies specialise only in designing clothes. Designing is part of the garment production process.

The majority of female students specialised in Fashion Production, while the majority of male students specialised in Textiles Design/Production. Garment production has historically been a significant area of women's work throughout the world while the production of textiles requires the lifting and handling of heavy industrial equipments and is likely to attract a lot of males.

Searches for Places for Industrial Attachment

An industrial analysis survey conducted in January, 2007 as part of the preparation for CBT implementation, identified a total of 57 companies who were willing to accept students for industrial attachment. However, in 2009 when the first batch of CBT students was ready to go into industry for IA, the story was different.

➢ Only **nine (9)** out of the **fifteen (15)** companies in Accra accepted students for IA in the first year. **Five (5)** claimed they were not ready to accept students at the time of the request, and **1** demanded payment for the IA.

➢ In Tema, only **two (2)** out of nine (9) companies accepted students,

four (4) were not ready to accept students at the time the request was made and **three (3)** could not meet the training plans of students.

➢ Only **two (2)** out of sixteen (16) companies in Kumasi were given students for IA. Very few students opted to go to Kumasi and the other cities (Takoradi, Cape Coast and Ho) surveyed. Majority of the students lived in Accra.

Therefore, of the 57 companies captured initially to form the IA company database, only **thirteen** (**13**) representing **23%** were active. Only **five (5)** of the thirteen (13) companies representing **38%** have accepted interns for all the 5 years under study. The **eight** (**8**) others **(62%)** accepted students only in first year of IA. As at March 2013, 4 years after the first survey, the number of active companies have increased from 13 to 50 that is, almost a 300% increase. This was because:

- The liaison coordinator identified past students of the department who were established and doing well, to receive students for IA.
- Almost every week, there is at least one request from industry for students' internship and permanent employment. They believe that the Polytechnic should be able to feed them with students who have the requisite skills. There is there-fore, an increasing demand for student trainees as compared to the number of students available. It is becoming increasingly difficult to satisfy all requests made.

Size of Industrial Attachment Companies

All the fifty (50) companies who received students for IA were small and medium scale in nature, employing between 2 and 25 people. Figure 1 shows the distribution of IA companies with regards to size.
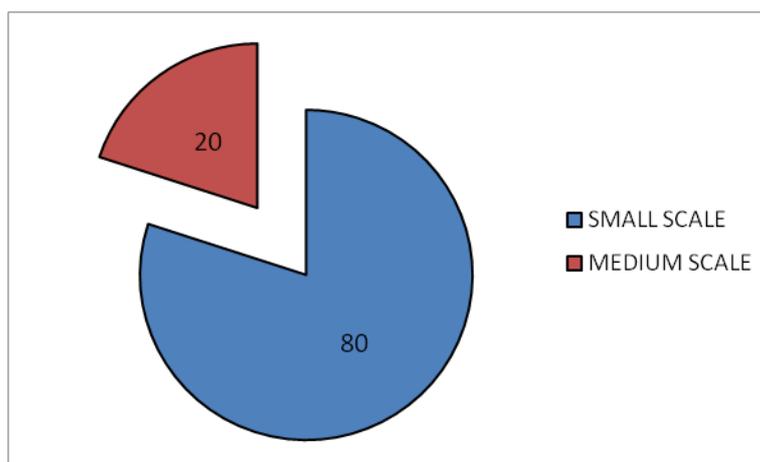

Figure 1: Size of IA Companies

The majority, (80%) were small scale operators and 20% were medium scale operators. Walmsley *et al.* (2006) categorised SMEs based upon the EU definition of businesses with fewer than 250 employees.

The IA companies were mostly privately owned, sole-proprietors who produced garments to satisfy local consumers while only four (8%) were into textile production. A report from the Institute of Economic Affairs (IEA) in 2002 stated that in Ghana, small and medium scale industries form the crux of the private sector whilst the multi-nationals make up for a few large-scale organisations operating in the private sectors.

As sole-proprietors, there was the big burden of having to organise everything that has to do with the business and so there was very little time to think of the training needs of students. This was confirmed by about 65% of the students who indicated that they were put straight into production in order to meet customer demands. Others (20%) were also made to do only alterations or the same work schedule (monotony) until they master the skills of sewing by which time the IA period would be ending. Another interesting revelation was that, for about (5%) of the garment companies, the Chief Executive Officers (CEO's) had no knowledge of sewing but were good administrators who had one good tailor

or seamstress working for them. One student referred to them as the masters who taught them all the skills.

Consideration for Placement

Students are placed in industry considering their specialisations (training interest), area of residence (proximity), knowledge, skills, values and attitudes. Students indicate these in their attachment plans. Figure 2 shows students' preferences in terms of training interest and proximity.
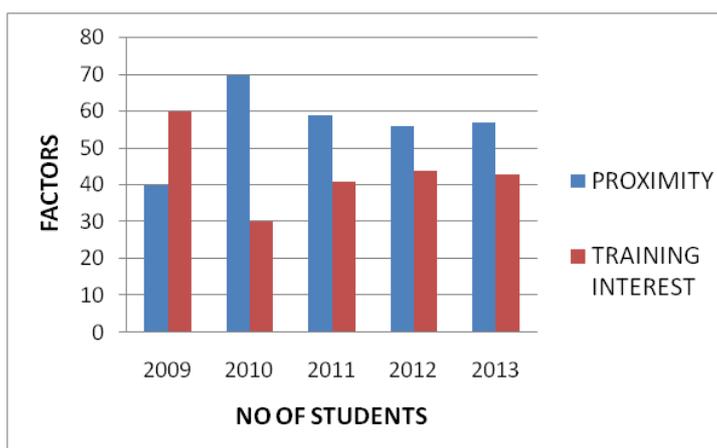

Figure 2: Consideration for placement of students

The majority of students preferred proximity to training interest. With the exception of 2009 which recorded a majority (60%) for training interest, the four other years recorded a majority of students being placed with regards to proximity. Figure 2 shows 70%, 59%, 56% and 57% for 2010, 2011, 2012 and 2013 respectively.

Using the data on training interest and proximity of students, the Department

Liaison Coordinator who is also a lecturer and academic counselor judges and matches students knowledge, skills, values and attitudes to IA companies for placement.

Interestingly, students still sometimes have to pick vehicles even if they are placed based on proximity. Textiles students have no option than to go to places where they will acquire the expected skills since the textile companies are not as many as the garment companies. Proximity is therefore out of the question, except in cases where a student is lucky to live close by. The "traditionally big" textile companies did not accept students and so the department had to fall on the small-scale ones who usually deal in tie-dye, batik and screen printing. In 2010, two (2) companies were discovered in this regard in Accra and Kumasi and all Textiles major students choose between the two. Majority of the students opted to go to the company in Kumasi as it has been identified as a well set up centre to deliver the skills needed. This places a huge financial burden on parents and guardians who have to take care of transport, accommodation and feeding. In some cases it brought conflicts between students and parents since wards had to leave home for between 4 to 6 months against their wish.

Duration of Industrial Attachment

The attachment duration is 16 weeks (the number of weeks in a semester). This duration was used in the first 3 years (2009, 2010 & 2011). However, most industry supervisors complained of the duration claiming that the students leave around the time they start grasping a lot of things which is rather unfortunate. It was also realised that students in other departments stay in school for the semester and also go for IA for between 6 to 10 weeks during the long vacation. Therefore the vacation internship period was added making it 16 weeks (semester duration) +10 weeks (school IA period) = 26 weeks (approximately 6 months).The duration was therefore increased to 20 and 24 weeks in 2012 & 2013 respectively. This is in line with Dr. Jakpasu's suggestion that polytechnic students need a full year practical training in industry to master skills (Modey, 2013).

The learning goals of a student could also imply that the attachment be done at more than one place. In this case, students were advised to clearly spell this out in their attachment plans and discuss the possible places and periods of attachment with the Departmental Liaison Coordinator. A summary of movement of students to and from companies is presented in Figure 3.

With the exception of 2009, which recorded a maximum of three places, the four subsequent years recorded a maximum of two. Placement in only one company recorded the highest that is, 66%, 82%, 72% and 96% for 2010, 2011, 2012 and 2013 respectively. Year 2009 was the take off year and the terrain was new, with very few textile companies willing to accept students. Most of the textile students therefore had to be placed in more than two companies. The two (2)
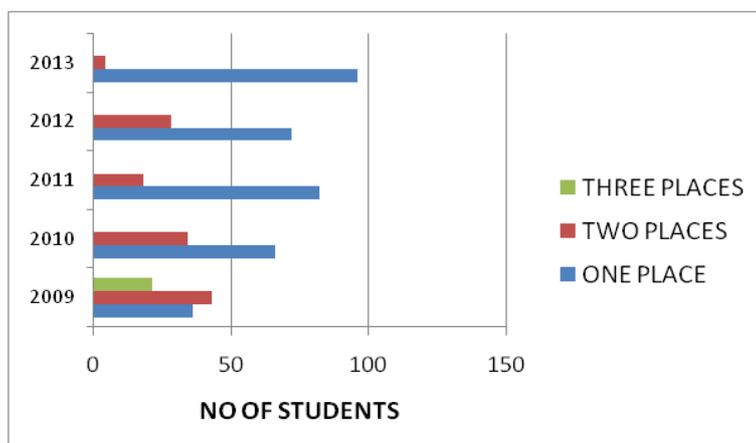
Figure 3: Number of places per student

companies discovered in 2010 in Accra and Kumasi subsequently helped ease the burden of placement for textiles students. Stability of students in companies improved from 66% in 2010, to 96% in 2013. This could be attributed to the fact that the Department Liaison Coordinator was gaining more experience in connecting students' training needs with IA companies. Again, most students were skeptical even when they wanted to move, for fear of victimisation drawing from some past students' experiences.

Payment for Industrial Attachment

One main problem students had with internship before the implementation of CBT was the payment for training received during industrial attachment. This was because traditionally, the transfer or acquisition of skill in sewing and textiles has been through the apprenticeship system, which demanded payment for skills acquired (Imirhe, 2004). Therefore, before the implementation of CBT,

students were paying for IA. However, after the Industrial Analysis Survey conducted in 2007, there was a mutual settlement for students not to pay for IA, and this has continued to be the norm. It was also realised that the apprenticeship system was gradually dying away since most of them had only one or two and in some cases no apprentices. The companies therefore have had no choice than to accept interns as a means of getting workers to help in production. It is however important to note that, at least three (3) companies demanded payment for the purchase of materials for production. This was in the case of the textile companies.

On the other hand, only 5 companies representing 10% gave some kind of transport allowance to students as a form of motivation. Others (about 10%) gave petty gifts in the form of store rejected clothes and bags, fabric pieces after cutting and lunch (once a while). Some students work beyond the normal working hours, as late as 10 pm, on weekends and holidays.

Again, three (3) out of the companies who approached the department to request for students, offered to give transport allowances but did not fulfill their promises later. They argued that the students have to be taught for about a month or two before they can make a

meaningful impact on the company's productivity and therefore the students should rather pay for the training received.

Students' Expectation from Industry

Fashion Production Option

Students expect to use the "free hand" method to cut intricate designs and go through all the process of cutting, assembly and finishing of a garment. Others are tailoring, men's wear, bridal wear, and fashion accessories. In 2011, one student who was already a seam-stress, wanted to know how to administer a fashion business.

Fashion Designing Option

Students expect to go through the processes of designing using various methods including the use of computer, drawing and illustrations, photography and the actualisation of designs using various methods of construction.

Textiles Option

Students expect to go through designing textiles especially using computer, screen printing, dyeing, weaving, graphic designing and the use of huge industrial textile equipment.

On the other hand, IA companies expect students to be of good behavior, proactive, confident, punctual and contribute significantly to the company's productivity.

Companys' Ability to Meet Students' Expectation

Fashion Production Option

Students had a lot of work to do as they were put directly in production of all types of clothing items and accessories. This further led to exposure in the two other areas of specialisation, that is designing and textiles.

Fashion Designing Option

Students in designing did not get too much exposure in designing since they mostly had to help in production of clothes to meet deadlines. In most cases the companies designs were recycled and a lot of customers also already had their own design preferences. Again, most companies did not have design departments for students to fit in. The Chief Executive Officers (CEO) are mostly the designers. One CEO remarked that "he holds the design aspect to his chest, it is a no go area". The non-existence of such departments means the absence of skill acquisition in designing like drawing, computer skills, sketching and illustration. Again the CEOs who are mostly the designers did not have time to teach the students. They had to do a lot of rounds to get the business going. In summary, there was no clear cut method of obtaining lessons in designing. In general, the fashion designing industry in Ghana is not very well developed. A student reported that the company has a design department but that is the last place

he will be posted to before he completes the IA (one week before the end of IA).

Textiles Option

Textiles students gained a lot of skills in desired areas except the use of computer to design. Those who were in Accra did not have any exposure in weaving.

Generally, the IA was quite beneficial. This is obvious from the fact that that students are able to do a lot of things they could not do before, and are confident to work on their final year projects.

Relationship between Students, Supervisors and Other Workers

There was a very cordial relationship between supervisors and students. Majority of the companies did not have permanent (reliable) workers and therefore, use students in production. They are therefore lenient with students in order to retain them throughout the IA period and this sometimes brings tension between students and permanent workers. One company in two (2) different IA seasons, lost all three (3) workers just before and after the interns completed IA.

Gaps Created in Industry after Industrial Attachment

One big problem with 1A is the gaps created in industry after students have completed IA. For instance, the IA period is between March to August each year. Therefore, from September to December,

there is a human resource gap to be filled. Companies prepare to receive interns in terms of provision of machinery, space, materials, human resource (time) and finances. This leads to a boom as other polytechnics send their students for IA around the same period. It also leads to a boom in production since students are able to help companies meet deadlines of customers. However, when students have completed IA, there is still demand for services but lack of labour to help in production. To compound the problem, the four other polytechnics send their students for IA around the same period. Sometimes, the companies demand that students come back after graduation to work but this is normally not possible as students have to do a one year national service after which they get all sorts of ideas like going back to school and setting up their own shops.

Willingness of Students to Return to Industrial Attachment Companies as Workers

From the records, only two (2) students returned to place of IA to work. One worked for 4 months and the other for 5 months. In general, students are not willing to go back to IA companies to work. The reasons given were:

- Students want jobs in well established ("big") companies.
- Salaries in small scale companies are not attractive.
- Work was too difficult during IA.
- Poor workplace environment.

Requests, especially for fashion and

textiles graduates to be employed permanently are therefore difficult to fulfill.

This results in an increasing demand for interns to help in production. Interns are however amateur and cannot fit perfectly into positions of permanent workers. Students are not taught to fit into the system but seen as a quick source of labour.

Supervision and Assessment

Students are visited only once throughout the IA period, instead of the proposed three times. There has been an increasing difficulty of getting the school management to fund the payment for expenses arising as a result of the new CBT curriculum, especially regarding IA supervision. CBT is expensive and the traditional system needs to be adjusted to cater for the financial implications. The inability to visit students regularly during IA creates the impression of irresponsibility on the part of the school.

In industry, assessment is done mainly by supervisors under whom students work. The supervisors are those who conduct assessment and sign a log book at the end of each week. They also fill out a comprehensive assessment form of the student at the end of the IA period. It was discovered that the CEO's are also the supervisors since most of them operate on a small scale. Only 5(10%) companies had separate supervisors or production managers to do the assessment.

There is the lack of a clear cut method of when and how the assessment should be done, and by whom. This is because, it is very difficult to give the CEO's further instructions on what should be done, apart from the instructions provided on the introductory letters and assessment forms. Too much explanation may tend to imply they do not know what to do. Some even misplace students' assessment forms and log books.

Conclusion

Industrial attachment is an important component of the CBT FDT programme at the Polytechnic. It provides familiarity with professional practice raises graduate labour-market value and enhances the students' maturity before returning to the final year. It is therefore imperative for the Polytechnics and employers to ensure that the IA experience is a beneficial and rewarding one, in order to retain fashion graduates in industry. This can be done by building a relationship with IA companies and investing the necessary resources in the IA programme. IA companies must also develop a professional attitude, even if it means changing some traditional company practices. Students must also apply all their energy to IA by giving it their best, being committed, hardworking, and adopting a positive and professional attitude towards the IA programme.

In summary, there must be commitment from all three parties to make IA mutually beneficial.

The Way Forward

Based on findings of the study, it is recommended that:

- The results of this research are communicated to the polytechnic administrators, FDT students and industry, to create awareness on the realities of the issues and problems arising from the IA programme.
- The relationship between the polytechnic, FDT students and industry can be improved by putting in place well defined and cohesive measures. This can be done if the polytechnic assumes a leading role in organising IA programmes through careful planning. For instance, students and industry should be involved in taking decisions that will help roll out a mutually beneficial IA programme.
- The Industrial Liaison Coordinator of the department should be strengthened by equipping him or her with knowledge and skills to administer the IA programme based on standard practice.
- Industry supervisors should find time and make themselves available to discuss with students, various issues and problems related to IA. Meetings between industry supervisors and the Liaison Coordinator on a regular basis should be encouraged, to discuss developing issues. This can be done during industrial visits.
- The Departmental Liaison Coordinator and industry supervisors can together discuss and agree on standard training guidelines to be used in training and assessing students more effectively.
- Polytechnics who offer FDT related courses should meet and revise the IA time table such that there will be a constant supply of students for IA throughout the year.
- The polytechnic can suggest to the National Service Secretariat to consider placing FDT graduates in related industries to solve their human resource needs.

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