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Re-Orientation of Negative Socio/Cultural Practices for Enhanced Participation of Technology-Related Programmes by Female-Students in Ghanaian Universities

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Abstract

This article is an extract from a PhD qualitative data-gathering research conducted in the year 2017. One of the themes of the research was focused on some of the socio/cultural issues that discourage females in pursuance of their technology-related programmes. A unique issue found to be hampering females' study in this area was female-students' denial in touching technological tools such as the saw during their Community Service (CS)in some communities in Ghana. The females therefore achieved no practical skills though this practice was graded. The disregard for this part of training which forms part of the formal education must not be allowed to gain momentum ,so ought to be trampled else the issue of egalitarianism is defeated for females studying applied science programmes. The stomping of this needs urgent attention

Keywords: technology-related programmes; gender differences in participation; brain laterilization; social constructionism

Introduction

Technical education and for that matter technology-related disciplines occupy a very important position in modern society since the global world has developed based on industrialization which is pivoted on technical education. Unlike grammar type of secondary education, technical education seems to be battling to gain recognition by the populace. Such an education is entrenched with practical content as the main source of manpower production and development. With the practical component, apart from the jobs that could be created through industrialization, individuals could be entrenched with self-reliant skills that could lead to self-employment. Technical and technological literacy and skills should be acquired by both males and females in the educational ladder since, providing equal technology-related education to both genders ensures a better use of scientific and technological resources. Quite a number of socio/cultural issues, however, militate against the acquisition of technological skills by females.

Prior to the introduction of formal education in Ghana, traditionally and socio-culturally, it has been reported by McWilliams and Kwamena-Poh (1975) that the home was the earliest and main educational agency of every child. They point out what a Danish merchant in the mid-1600s observed about the *Nfante* Community; that a boy after following the father could learn a trade and get initiated into the customs and traditions of the family and the society. Such professional training for the males included specialized functions in priesthood, hunting, state drumming, blacksmithing, wood-carving, rope-making and boat-building. Young men of the 'Fetu'

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tribe for instance were also noted to have attended sessions of law courts to equip themselves with tribal law since there were no alphabets to learn from. On the other hand, McWilliams and Kwamena-Poh (1975:3) again state that:

> From age six, the young girl would be taught how to clean the house, make fire, and prepare the various meals. At a later stage, she would learn mother-care from the mother or the older women, while the young boy would begin to pick up the father's profession

Through such informal system of training, it could be deduced that the females gained experience towards traditional home-making skills whilst the males were groomed towards acquisition of technological skills. Experience in this context is defined by Merriam Webster dictionary as the process of doing and seeing things and of having things happen to you. It also explains it as the skill or knowledge that one gains by doing something over a length of time and of a particular job. The females in this regard, always gained experience in domestic chores.

In the late eighteenth century and throughout the nineteenth century when formal education set in, in describing the enrolment into the castle schools, Graham (1975 in Danso, 1996) and Oti-Agyen (2007) report that: the pupils were largely sons of European merchants and local women (mulattoes). The enrolment was however supplemented by the admission of children of some wealthier African traders in the urban centres. An example is cited of an Ashanti chief who sent twelve (12) boys and two (2) girls to the schools in the 18th Century' (Goves, 1958 in Danso, 1996:10).

Although the technological sector of education started as early as the 18th century by the missionaries, based on quite a number of impediments especially socio/cultural stereotypical issues, it has not been attractive to females. Such socio/cultural stereotypical issues happen to be the core of this article. This paper therefore discusses the problem statement, significance, research methodology, conclusion and suggestions made

Literature Review

The first school opened for girls in 1821 at Aburi by a widow of a merchant though lasted for seven years had Sewing and Home Science as the content of the curricula (Danso, 1996). A lot of curricular changes were effected in the ordinances enacted afterwards and in 1882, the subjects included Drawing, Industrial Instruction and Physical Exercise. The ordinance also stipulated that the pupils had to sit for annual examinations individually in Reading, Writing and Arithmetic, and girls had to be assessed in Needlework (Foster, 1965; Graham, 1971 in Danso, 1996).

One could deduce that boys' exemption from taking Needlework set the pace for subject segregation and this dates as far back as the colonial days. Contrary to this too, technological development over the years has transformed society which could suggest changes in the thought process. Females abound in the law courts though hitherto reserved for the boys as described earlier; why not engineering then? Does this justify the theory of brain laterilization which stipulates that females have stronger verbal ability as against the spatial ability? Concepts such as gender and sex are associated with such traditional and cultural issues hence a brief discussion on that would be useful.

Gender, refers to the attitudes, feelings, and behaviors that a given culture associates with a person's biological sex. In general, gender according to www.biology-online.org/dic originates from the Latin word "genus" which means ' a class or group with common

attributes'. Gender in the context of this article refers to socially-constructed roles of relationship between females and males. In that sense gender refers to the attribute, opportunity and socialization process which are changeable by time and context. Purnamawati & Utama (2019) see gender as a reference to the roles and responsibilities of men and women based on social and cultural conditions of a society" To Nobellius (2004), it is important to study the extent to which gender roles are because of social conditioning or enculturation.

Pederson (2001:4) also refers to gender at any given point in time, in a given culture, to be a "woman" or a "man." The specific content of gender varies historically and culturally; thus, gender norms and values differ from place to place and time to time. Gender also involves cultural identity and generational position, as these are elements that may lead to variations in the content of gender. Thus, whereas sex that is being female or male cannot be changed unless under specially agreed-upon circumstances and surgery, 'gender' can change. Per this discussion, being male or female cannot change across cultures, but behaviours erupted from societal influences or identities could change.

Seward and Seward (1980) for instance explain that the conviction of belonging to one sex rather than the other appears early and is deeply imprinted on the child. Sex-roles are foisted on children by parents through socialization. "From the moment the new baby is placed in a pink or blue blanket, society lays its imprint upon it and begins to shape its gender" (Seward and Seward, 1980:90). This leads to an accepted spontaneous differentiation like aggression in the boy-child and submissiveness in the girl. In mixed group interactions for instance, analysis has shown that not only do males monopolize tools and equipment in workshop lessons but they frequently take far more their share of another major resource – the teachers' time and attention (Seward & Seward, 1980). In this research upon which an extract was made, culturally, the male-students were permitted to hold and use the technological tools unlike the female-students. What is culture then?

Culture has generally been defined as the way of life and living of a particular society. Socialization patterns of females right from early childhood shows disparity in development right to adulthood . With custom and traditions being very well upheld in Africa in general, Kwesiga (2002) expresses that parents generally have been noted to be apprehensive about the status quo of their female children getting altered thereby changing the female's traditional practices and roles within society. Most mothers feel that they might lose 'assisters' in the house leading to the tending out of all the domestic chores alone if they overlook traditional norms. It was for instance explored that the Sub-Saharan African (SSA) society expected all females to marry and play roles expected of wives. On that issue, the reasoning of the society was that women needed just enough education to see them through marriage successfully. As a result, when given the option and under limited resources, the fees of a boy in the family would be paid first. This was revealed in research conducted by Kwesiga (2002) in Uganda. In that research, a student from Makerere University in Uganda remarked that his father ordered that his sister constantly stay home and assists the mother with the farm-work until there was enough money to cater for her later. Statistically, in that survey by Kwesiga, whereas 34% of parents opted for payment for sons' schooling, 11% opted for girls whilst the rest (55%) had no preference. Thus, Kwesiga (2002:167) states that "parental attitudes are the biggest determinant, very distinct from other obstacles which might include division of labour, customary practices and unavailability of

institutions". Some parents see females' participation in engineering as a taboo or too masculine.

As was noted particularly in Ghana in the historical background analyses, males usually learnt the occupational skills of their fathers whilst females adopted the domestic chores. Kwesiga (2002) again expresses that some parents consider females as naturally endowed with catering for children hence domestic chores should be relegated to them.

In schools too, the patterns of task assignments given by teachers were also found to differ. Whereas girls are usually assigned responsibilities related to domestic or clerical tasks like sweeping the classrooms or picking the garbage, boys are often assigned more authoritarian and leadership roles like monitoring the class during teacher's absence or taking message to the head of the school. Skelton et al (2006) emphasise that these have serious consequences on students' evolving identities and subjectivities which might lead to their adult lives. Teachers' gendered interactions with the students were also critically observed by Skelton et al (2006). These behaviours were noted to cut across all levels of education including universities.

In this research from which this article was couched, it is really puzzling that serious enrolment disparity should prevail in the 21st century for females and males. Some years ago, females' absence in technological developmental activities was considered somehow normal as an adage in Akan the largest ethnic group in Ghana states: "*obaa ton nyadowa na onton atuduro*" literally translated as "*a woman sells garden-eggs but not gunpowder".* Quite a number of females might have imbibed this adage and therefore consider themselves weak or vulnerable thereby restricting themselves to menial domestic chores, petty trading and vocations which prevent them from taking the practical technological-oriented jobs requiring activities such as lifting of planks and sawing of metallic bars and rods. In this technological era however, fork-lifters and power-hacksaws get such tasking jobs performed respectively under the instructions of the operator (Oti-Agyen, 2023) . Their operations are therefore not beyond the capabilities of females.

Problem Statement

The study of technology-related programmes (Engineering) to be specific involves not solely the theoretical or cognitive domain of acquisition of knowledge. It is a tripod acquisition of knowledge involving cognitive, psychomotor and affective domains. Basically, such programmes deal extensively with the acquisition of psychomotor or practical skills. At the university level, practical skills are acquired not only in the lecture theatre but also outside the premises of the university where students get attached to experienced technicians and artisans in order to upgrade the practical skills acquired in the universities. In some universities, this is termed Industrial Attachment (IA) whilst some refer to it as Community Service (CS). In this article, whilst some students were on CS, the female-students were denied access to the use of the technological tools whilst the males were allowed to use them perhaps based on socio/cultural stereotypical beliefs. Such a cultural norm restricting interactions between male experts and females could hamper the study of technology-related programmes for females. The principle of egalitarianism is abused and there is a need to critically address this phenomenon. There is a need for a re-orientation of this negative socio/cultural practice for enhanced participation of technology-related programmes by female-students in Ghanaian Universities and subsequently towards skilled-related careers.

The need for such a reorientation and the practical suggestions to offset the imbalances constitute the thrust of this paper.

Purpose of the Study

Regarding the problem identified, the main purpose for writing this article is to unearth the cultural practice hindering the practical acquisition of skills by females pursuing technology-related programmes particularly Community Service (CS) in order to redirect the orientation of male practitioners.

The **objectives** are to:

- Find out the main cultural practice inhibiting the study of technology-related programmes by a section of females in Ghanaian universities.
- Suggest interventions towards the eradication of this negative socio/cultural practice.

Research Questions

In respect of the purpose, objectives set, and the brief review of literature, the research questions formulated are:

1. What is the main socio/cultural attitude that discourages females' participation in the technology-related disciplines?
2. What interventive measures could be implemented towards the eradication of this negative socio/cultural practice?

Significance

According to the European Commission (2008), gender balance in science education ensures the recruitment of most talented people thereby leading to the use of unexploited resources (especially in women). This could also enhance policy-formulation in gender issues pertaining to Ghanaians. Again, with the increased numbers of technical occupations, females should be guided to broaden their horizon in order to enhance their potential in technology-related careers and also reduce the suffering from unemployment. Weber and Custer's (2005) research findings describe the arguments made by prominent U.S. economists and educational leaders on the limited technological literacy amongst females that: "*all students of both genders need to acquire the skills necessary to become consumers capable of critically assessing the technologies they use, resulting in the ability to make more informed decisions*" (p. 55).

Further, apart from females' higher education in science and technology (S&T) or technology-related careers encouraging role modelling, it is noted to improve health, nutrition and maternal health which ensures low mortality rates (Anamuah-Mensah, 2007; Kabeer, 2004) – an attainment towards the success of the 2030 Sustainable Developmental Goals (SDGs**).**

Methodology

Research Design

In considering the data-gathering, a number of research designs such as action research, cross-sectional, descriptive, experimental, historical designs that could have been chosen to guide this research came into mind. A phenomenological qualitative study was conducted and based on the explanations by some researchers including Leedy and Ormrod (2005:96), Neuman (2007), De Vaus (2001), Atkinson & Hammerseley (1994) and Bryman (2008), the exploratory design was found to compliment a phenomenological study. Within the exploratory design, the catch-phrase 'back to the things' which could be traced to Husserl, cited in Cohen et al (2003) as transcendental was considered. This is the process of investigating into things as they directly appear rather than through 'media of cultural and symbolic structures' (Cohen et al., 2003: 24).

Justification for the Exploratory Research Design

Neuman (2007) explains design in research as the planning and making of all the integrated statements and justifying all the technical decisions involved in the planning before the research project is conducted. Neuman (2007) further explains that exploratory research addresses the question under "what" in a social activity (thus what the problem is about). Some of the specific questions framed during data gathering went beyond the 'what' prefix to 'why' and 'how' in tune with Streb (2010) who explains that exploratory research is flexible and can address research questions of all types (what, why, how). The 'why' was necessary to acquire knowledge in the reasons why the female student-participants were not permitted to touch the technological tools used by the male artisans during the CS.

Population and Sampling

The approaches adopted for the conduct of this research were to seek various views to interpret the widely perceived view of gender and low enrolment in science or technology-related courses. As a result, the population or universe also known as sampling frame which could be defined as "*an aggregate of all cases that conform to some designated setoff criteria*" (Blaikie, 2010:172) comprised five universities and university colleges made up of two (2) public and three (3) private. The total student-population of the departments sampled for the main research was 383 out of which fifty-three (53) were purposively drawn by a non-probability sampling technique. The boundary of the population included all the students offering technology-related programmes. Additional five (5) lecturers led to a sample-size of fifty-eight (58). The decision to sample small numbers for this research was not necessarily due to difficulty in scheduling large numbers based on time constraints or difficulty of controlling large numbers or financial constraints as mostly noted by researchers such as Denscombe (2008). It was rather due to the nature of inquiry thus, in employing qualitative techniques, in-depth information about participants was sought rather than breadth of sampling as found in surveys.

In considering the procedure for sampling, all the females who in most cases were found to be far lesser than the males in the population for each Department were selected purposively upon initial discussion on mobile phone. These were students who pursue technology-related programmes. The sample which was therefore 'hand-picked' (Denscombe, 2008:17) was based on the fact that those selected were those likely to produce the most rich or valuable data. The selection by purposive non-random sampling as characterised of qualitative researchers was homogeneously carried out by initially telephoning the Heads of Departments (HODs) after informed consent had ethically been sought from the Deans of faculties. Other examples of non-random qualitative sampling that could have been used include: theoretical, quota and convenience sampling.

Data-collection Procedure

Besides the telephone-assisted sampling, the researchers made two visits to the respondents' faculties. The first was to seek informed consent or permission from the Deans to conduct the research. When the consent was granted, the second visit was made to make the necessary arrangements for the conduct of the interviews. On the third visit when the interviews were conducted, the researchers made the purpose known to them, sought their consent and assured them of absolute confidentiality and anonymity as research ethics demand.

In all, data were collected from all the five units within the month April and November 2017. One-to-one interview and focus-group interview or discussions were conducted. A pilot study carried out from 24th to 26th January 2017 prior to the main research helped to correct some of the ambiguities that would have occurred especially clarifying issues on the informed consent sheet and the venues for the research. Interviewing became necessary as they assisted in the acquisition of first-hand or primary information from the participants (students and lecturers). Mason (2002) expresses that epistemologically or knowledge-wise, interviewing is the best way of retrieving data in qualitative research. Bell (2008) also states that; "*a skillful interviewer can follow up ideas, probe responses and investigate motives and feelings, which the questionnaire can never do*" (p.157)

On analysis of raw data, although no standard methods have been structured in qualitative research as compared to quantitative, the analyses were based on the five approaches generally accepted for analysing qualitative interviews explained by Kvale (1996) vis-à-vis; categorization, condensation, narrative structuring, deeper interpretations and ad hoc tactics. These were considered after the transcription.

Analysis of Data

After the transcription, the next activity was the categorization. In that event, a consideration was given to the most relevant data. The responses were categorized under themes in accordance with the preparation of the research questions framed. Since the analysis was started right from the day of interviewing, during the transcription, manageable amount of interview material could be analysed about the subject matter as well as the reasons why such responses were given by the participants. The transcriptions were coded into categories by reducing long sentences to short ones and structuring large text into tables and figures. Most of the transcripts of long sentences were condensed (condensation) by compressing into briefer statements through rephrasing. The main texts were organized to bring out the meanings at the narrative structuring stage. These statements were deeply interpreted. Other codes came up serendipitously whilst seeking clarification through prompting and probing during the interviewing. These were thus developed by ad hoc and the most interesting and revealing responses were recorded verbatim in the report.

Findings/Discussions

The most significant socio/cultural hindrance to female-students pursuing science and technology-related programmes upon which this article is pivoted was the segregation meted out to them when they embarked on community service (CS). They were disallowed to touch the tools used by the male workers. This happened during the third trimester of the students' programme in Wa, Gumeipala in the Upper Western region of Ghana. Thrift, a participant of the CS stated that:

> They [artisans] were all males. When we got there, one of the ladies said she wanted to know how they do it. She was just speaking and a man was like "no don't touch it, ladies don't touch it'… Since it wasn't our community and we have been told that when they say, don't do this, don't do it, so we came back and were like why women don't touch this thing?" (Interview Transcript 5: November, 2017)

According to the participants, when this issue was probed further as to why females should not touch the tools, no explanation was offered except the statement - "*ladies don't touch it"!* The explanation offered by two old women upon enquiries was that the artisans had no knowledge about the menstrual status of the females and it is an abomination to hold the tools since that could collapse their business if in the menstrual cycle. Although the

participants did not highlight issues connoting superstition, they expressed their views on the segregation of roles by the people in the communities.

The participants further expressed how the people in their communities consider certain practices more suitable to boys than to girls especially on the issue that "*the tools are too heavy for the girls to carry"*. The participants expressed the need for a change or transformation in the mindset of the people. Yaat, one of the female participants of the research explained how she acquired interest in technical education as early as in the junior high school (JHS) by visiting an uncle who owned a carpentry's workshop in Accra who allowed her to practice how to saw. The puzzling question is why should a female at a point be allowed to hold the tool as early as the JHS level and others at another area be refused at even University level?

In the main research, other barriers considered as hindrances to the study of technology-related programmes by females across the sampled Universities were religious practices and domestic chores. On religion, it emerged that some religious leaders disallow females from mounting the pulpit and that puts fears in females and reduces their confidence. The chores have briefly been discussed in the background earlier.

Conclusion

The CS is one of the ways of learning outside the lecture theatre and this is for improving self-confidence in skills' acquisition yet the female students were disallowed to touch and use the tools. At least if given the opportunity to practice with the tools, the stereotypical cultural believes of some of the courses preserved for males and females would be reduced. This would oppose the dichotomy or belief that females are born with verbal or language ability as opposed to males considered as possessing spatial skills or scientific and mathematical ability. The researcher therefore made the following suggestions to school authorities:

Suggestions

To diversify the technology-related fields for female students, a critical look into cultural stereotypes and biases that still pervade cultural issues must be taken. It is suggested that faculties of Universities instituting Community Service (CS) or Industrial Attachment (IA) programmes ensure that students are issued with questionnaires that would spell out all criteria governing the exercise before embarking on them. Students should be assisted by the heads of departments or coordinators of such programmes to reach credible industries that would not discriminate in terms of gender and skill acquisition. There is a need for universalism that is the "*value that ensures that all people are treated similarly and that there is no favouritism based on family/friendship connection, or payment*" (Haralambos & Holborn, 2004: 307).

About those micro industries that discriminate too, the Ministry of Education (MoE) could institute positive measures by selecting samples and imposing females who embark on CS on them and providing tools and machinery to them on experimental basis just to prove whether their businesses would collapse when females are engaged in it. Such subsidies to the artisans would encourage them and also disprove the stereotypical attitude. Without such conscious and positive programme, that culture would be very challenging to break.

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