

An Assessment of the Quality of Print Medium in Distance Learning for Undergraduate Programmes in Kwame Nkrumah University of Science and Technology

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ABSTRACT

The Institute of Distance Learning-KNUST offers courses through distance education. The mode of delivery of DL programmes in KNUST is predominantly by print medium. Two print materials, EE 287 Circuit Theory and GE 183 Principles of Land Surveying are among the twenty-five print materials used to facilitate learning in Computer Engineering and Building Technology programmes. Though current print media used by learners in the undergraduate programmes has contributed to learning by students, however, they have provided challenges to learners. Learners have reported on gaps in the learning materials thus making utilisation difficult. In order to identify and meet the needs and grievances of students relating to the suitability of course materials, the study sought to assess the quality of two print media for undergraduate studies in Computer Engineering and Building Technology programmes in KNUST. A structured questionnaire was used to collect data from students offering Computer Engineering and Building Technology programmes. The results of the study provide ample evidence to show that instructional materials assessed are *about* appropriate and useful. Hence there is room for improving current print materials used by DL. It also reveals the lack of female participation in the two courses and suggest an improvement of the situation through gender awareness and promotion activities at all levels of DE programming.

Introduction

Background of Study

There is a general problem of access to tertiary education in Ghana. Available statistics indicate that from the 2005/2006 academic year, only 55% of qualified applicants were admitted into all the public universities and 78% into the polytechnics (NCTE, 2006). From the early 1990s Distance Education (DE) began to receive government attention (Spronk, 1999) to address the excessive demand for tertiary education in the country. DE has since emerged as a tool for widening access to higher education for personnel in employment and those who could not be accommodated in the conventional tertiary education process. Its use has made the process of obtaining an education without regard to time or location easier for the learner.

Since 1996, four Ghanaian public universities have pursued DE programmes. University of Education (UEW) was the first tertiary institution to take off in 1996 as a result of assistance from the then British Overseas Development Administration (ODA) now Department for International Development (DFID). UCC and University of Ghana (UG) followed in the 2001/2002 academic year with diploma programmes in Basic Education and Youth in Development Work respectively. The Kwame Nkrumah University of Science and Technology (KNUST) however started its DE programme in 2005.

There are a variety of systems and modes for delivering distance education to learners. They fall into four major categories: Print, Voice, Video and Data. Print is the most common medium for learning at a distance. According to Lewis (1985) and Holmberg (1989), worldwide surveys of distance education show that print is by far the most used medium and is considered the most important medium in the presentation of learning materials by distance educators. Bates (1982) notes that print is the most convenient and flexible medium for the presentation of new information and ideas and can be used by students selectively and at their own pace. Print has many advantages as an instructional medium. It is familiar, inexpensive, and portable. Its format allows readers access to any section, in any order, for any length of time. In Africa print is the most widely used medium because of the challenges facing the use of contemporary technological tools such as on-line learning based on internet-connected computers. According to Osei et al (2008); Osei Darkwa and Fikile mazibuko (2000), the

limited use of ICT (on-line learning, e-conferencing, emails) for information delivery may be attributed to unavailability and unreliability of power supply and low bandwidth and connectivity which affects the use of ICT as delivery media and contribute to slow website update respectively.

KNUST is one of the four public Universities in Ghana that provides education in both face to face and distance modes (Osei et al, 2008). It is an important centre for training of scientists and technologists by its offer of a range of programmes of study. KNUST has offered Distance Learning (DL) programmes since 2005 through the Institute of Distance Learning (IDL). IDL is responsible for the organisation, administration, and coordination of DL programmes and courses that include Computer Engineering and Building Technology at the undergraduate level (Table 1). Members of staff of faculties offering programmes by distance education prepare all study materials and assignments in accordance with approved course outlines.

Table 1. Undergraduate Courses by number of materials

Type of Programme	Year (2007/8)	No. of courses/print materials
B. Sc. Computer Engineering	1	6
B. Sc. Computer Engineering	2	7
B.Sc. Building Technology	1	7
B.Sc. Building Technology	2	5
B.Sc. Actuarial Science	1	
B.Sc. Actuarial Science	2	

The mode of delivery of DL programmes in KNUST is predominantly by print medium. Print is therefore the primary delivery vehicle that brings together facilitator and learner supplemented by occasional face-to-face tutorials, telephone and email contact when needed. Though the use of print medium in DL is considered as old fashioned and not as glamorous medium as the colourful computer-based graphic resources for distance learning, it is still relevant in Ghana because learners find it useful both at home and in their community setting because it does not depend on power supply and access to computers and programmes. Two print materials, EE 287 Circuit Theory and GE 183 Principles of Land Surveying are among the twenty-five print materials used to facilitate learning in Computer Engineering and Building Technology programmes. The two print materials like other media produced by IDL are aimed at enabling students to learn at their own pace and convenience and reducing time required for mastery. The medium is also used to promote discussions among students and establish academic credibility. An IDL course material is fragmented into course units and sections of units. It also contains symbols and visuals, learning track activities (which comprise a summary for the unit), key terms in each unit, review and discussions and unit assignments.

Because print is largely a one-way communication medium, the challenge is to design instruction to maximize the amount of interaction in distance education print materials. Misanchuk (1994) suggests that distance educators write instructional materials with language more like that used for speaking than for writing journal articles or books. He recommends that the course introduction can include biographical background information about the instructor, a course overview, course goals and aims, a listing of any textbooks or ancillary learning materials that will be needed, and information about assignments, examinations, and grading.

Statement of the problem

Current print media used by learners in KNUST undergraduate programmes has contributed to learning by students. However, they have provided challenges to both learners and writers of DL materials. While learners have reported on gaps in the learning materials thus making utilisation difficult, writers have had to write in unfamiliar terrain-the distance mood. In order to identify and meet the needs and grievances of students relating to the suitability of course materials, the study sought to assess the quality of two print media for undergraduate studies in Computer Engineering and Building Technology programmes in KNUST.

The objectives of the study were to:

- Describe the demographic characteristics (age, sex, educational background and current job by programme) of learners in the BSc Computer Engineering and Building Technology programmes
- Determine appropriateness (objectives, content) of print materials for learning
- Determine the readability (language level, clarity of symbols, ease of understanding, guidance on how to use materials) of the print materials and
- Determine the technical quality (quality of visuals, appearance and layout, font size and type) of the print materials

Methodology

A structured questionnaire was used to collect data from students offering Computer Engineering and Building Technology programmes. The questionnaire consisted of fifteen questions; five questions were close –ended and ten were open ended. The population consisted of sixty 2007/8 Computer Engineering and Building Technology learners.

The instrument for data collection was structured to find out the appropriateness of the materials, ease of use and the effect of the design on use of materials. The questionnaires were administered to 60 learners during a face-to face session. Out of the 60 questionnaires distributed 56 were returned out of which 53 were found to be useable responses.

Results and Discussions

Demographic characteristics of respondents

The study focused on aspects such as sex, age, marital status, employment status and educational level of respondents. Table 1 indicates that males accounted for 98% of the two courses (EE 287 Circuit Theory and GE 183 Principles of Land Surveying) indicating total male dominance of the two courses. This follows a similar pattern of low female representation in traditional face-to-face science courses in KNUST. Researchers like Przymus, (2004), Plummer (2002) and Canevale (2002) have indicated that women in DE are underrepresented in science, technology, technical and mathematics oriented courses.

Table 1. A summary of the demographic features of respondents

Characteristics	Frequency (n=53)	% of Respondents
Gender		
Male	52	98
Female	1	2.0
Age		
Below 25	3	7.0
25-30	20	37.2
31-35	14	25.6
Over 36	16	30.2
Marital status		
Married	26	48.8
Single	27	51.2
Employment Status		
Employed	47	88.4
Unemployed	6	11.6
Current Academic Qualification		
GCE O Level	7	14.0
GCE A Level	7	14.0
SSSCE	25	46.5
HND	14	25.6

More than half (about 63%) of the respondents are within the age group of 25-35 years while about 30% are over 30 years. Only 7% of the learners are below 25% indicating the maturity of the distance learner. According to Dubios (2003), DE encourages older people to seek higher education. Forty-eight percent of respondents indicated they were married while 52% were

single. This is in contrast with studies conducted by Frimpong-KWAPONG (2007) and Qureshi (2002) who found that the DE format attracted more married participants than single students.

Majority (88.4%) of the respondents were in employment with 11.6% unemployed indicating that DL is predominantly accessed by personnel in employment. Danesh (2003) asserts that DL is a viable solution for learners who face obstacles due to job responsibilities.

About 47% of respondents had SSSCE qualification and 28% had GCE O and A levels while 14% had HND qualification. With this background the use of print medium was not expected to provide any readability problems.

Table 2. Results of the Survey

Characteristic	Agree	About agree	Disagree	Total
Objective of module is clear	36 (67%)	13 (25%)	4 (8%)	53 (100%)
The content is adequate – adequate body of knowledge	35 (66.7%)	0	18 (33.3%)	53 (100%)
The content is relevant and organized	35 (66.7%)	9 (16.6%)	9 (16.6%)	53 (100%)
The level of language used is appropriate	22 (41.7%)	22 (41.7%)	9 (16.6%)	53 (100%)
The symbols used are clear	36 (67%)	13 (25%)	4 (8%)	53 (100%)
The guidance on use of material is helpful	40 (75%)	13 (25%)	0	53 (100%)
It is easy to understand/ use material	13 (25%)	40 (75%)	0	53 (100%)
The quality of visuals is good	31 (58.4%)	18 (33.3%)	4 (8.3%)	53 (100%)
The appearance and layout is appealing	31 (58.4%)	13 (25%)	9 (16.6%)	53 (100%)
The font type and size used are adequate	22 (41.7%)	18 (33.3%)	13 (25%)	53 (100%)

Appropriateness of print materials for learning

Respondents were asked questions to assess the appropriateness of two print materials (EE 287 Circuit Theory and GE 183 Principles of Land Surveying) used in Building Technology and Computer Engineering courses respectively. Since content in the material is organized based on the

identified objectives, material appropriateness was operationalized as clarity of objectives and adequacy/relevancy of content. A likert-type scale was used to summarise the results of their responses. Majority (67%) of respondents indicated that the objectives of the modules were clear and contents adequate in terms of body of knowledge and relevancy. However in an open question on appropriateness of the material, some (33%) respondents indicated that the materials were not self explanatory and were full of assumptions. They also suggested the inclusion of more worked examples in the books to enhance adequacy of content. Misanchuk (1994) suggests that distance educators write instructional materials based on a well-organized content outline from which the written content will easily flow. He advises on the inclusion of lots of good examples and analogies in print-based materials ensuring that these examples address the various cultural groups, ages and experiences of the students.

Readability of material

A concern of the study was about readability of the two print materials (EE 287 Circuit Theory and GE 183 Principles of Land Surveying). Respondents were asked to assess statements related to language level, clarity of symbols and ease of understanding of the two materials. About 83% of respondents indicated some level of agreement on language appropriateness of materials used. Also 92% of respondents indicated that there was clarity in the symbols used in the study materials while all respondents (100%) indicated some level of agreement on ease of understanding of the two materials. When asked about whether guidance on use of material is helpful, all respondents answered in the affirmative. Results in Table 2 show that majority of respondents approved of the readability qualities of the two print materials based on language level, clarity of symbols and ease of understanding. The high readability rate could be attributed to the requisite education background/certificate of learners. In an open question on readability of the materials, some (45%) respondents indicated the lack of explanation of terminologies and symbols used in the print materials.

Technical quality of print material

Respondents assessed the technical quality of the print material looking at the quality of visuals, appearance and layout, font size and type. Majority of the respondents indicated that the quality of visuals were good or about good (about 92%). To a question on whether appearance and layout is appealing, about 85% of respondents responded positively. However a considerable number of respondents (25%) felt font size and type used in the text were inappropriate.

Respondents commented on poor page arrangements (interchanged pages, pages turned up-side-down) in some of the course materials.

Recommendations and Conclusions

The study has assessed the quality of two print media for undergraduate studies in Computer Engineering and Building Technology programmes in KNUST. It provides ample evidence to show that instructional materials assessed are *about* appropriate and useful. Hence there is room for improving current print materials used in undergraduate studies by DL.

Well written course materials promote discussions between students and facilitators. In order to improve the quality of course materials written in the distance mode there is the need to train course material writers and facilitators/instructors to enable them adopt to this new teaching paradigm-the distance mood..

Course material writers should play down on assumptions and be encouraged to include more worked examples in their course materials to enhance adequacy of content. Terminologies and symbols used need to be explained in order to avoid differences in interpretation.

Technical quality of DI materials should not be compromised since it may affect use of a course material. Attention should therefore be paid to font size and type in the text, page arrangements and use of visuals.

References

- Collins Osei, Reuben Aggor and Edward Badu. Technology-Mediated Open and Distance Education (Tech-MODE) in Agricultural Education and Training for Improved Livelihoods. A Ghana Case Study (2008). In: Alluri, K. and Zachmann, R. (eds), Technology-Mediated Open Distance Education for Agricultural Education and Improved Livelihoods in Sub-Saharan Africa, pp 47-60. Published by Commonwealth of Learning.
- Frimpong-Kwapong **O.A.T** (2007), Widening Access To Tertiary Education For Women In Ghana Through Distance Education. Turkish Online Journal of Distance Education-TOJDE October 2007 ISSN 1302-6488 Volume: 8 Number: 4 Article
- McNaught, C. (2002). Quality assurance for online courses: Implementing policy at RMIT. *The Technology Source*. Retrieved January 7, 2002, from <http://ts.mivu.org/default.asp?show=article&id=940>
- Mensa and Owusu-Mensah, (2002). Priorities and Strategies for Capacity Building in Tertiary Distance Education for Human Resources Development in Ghana, A final Report prepared for the World Bank
- Misanchuk, E.R. (1994). Print tools in distance education. In B. Willis (Ed.), *Distance education: Strategies and tools* (pp.109-129). Englewood Cliffs, NJ: Educational Technology Publications.
- NCTE (2006). Statistics on Tertiary Education in Ghana: Ministry of Education
- Osei Darkwa and Fikile Mazibuko (2000). Creating Virtual Learning Communities in Africa: Challenges and Prospects. Volume 5, number 5 (May 2000)
- Qureshi E., Morton, L. L., Antosz E. (2002). An interesting profile - University students who take distance education courses how weaker motivation than on-Campus students. *Online Journal of Distance Learning Administration*, 5(4).
- Spronk, B. (1999). *Ghana distance education development project - UPCD tier 2 mid-term evaluation*. England: International Extension College (IEC), 33.
[URL:http://firstmonday.org/issues5_5/darkwa/index.html](http://firstmonday.org/issues5_5/darkwa/index.html)
- Verduin, J. R., Jr., and T. A. Clark. 1991. *Distance Education: The Foundations of Effective Practice*. San Francisco: Jossey-Bass, pp. 81-83.