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Developing the Skills and Techniques for the Production of Instructional Materials by Teacher Trainees at Gambaga College of Education

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ABSTRACT
The study sought to analyze the skills and techniques acquired by teacher trainees, in art related to producing IMs during teaching practice at Gambaga College of Education (GACE). The role of Instructional Materials is to glue information into learners' minds, as what is seen is understood more than what is heard. Active participation stimulates and motivates learning. The presence of well-prepared IMs in the learning environment creates room for learners to interact or explore with it and that increases the quality of knowledge acquired and broadens the horizon of mastery of knowledge. The study adopted action research and descriptive and experimental methodologies to study the skills and techniques as well as materials adopted for the production of IMs by teacher trainees at GACE. The study found that teacher trainees exhibited poor skills and techniques in the production of IMs. They also adopted materials that can easily be destroyed and in addition, limit pupils' interaction in the lesson. This, therefore, does not motivate pupils to learn.
Keywords: *visual arts related; instructional material; teacher trainees; teaching and learning*

INTRODUCTION

Art-related courses offer students teachers and learners a unique opportunity to acquire a range of skills that can be applied across several fields, including the creation of instructional materials used for teaching in basic schools (Essel, Nunoo, & Ahiaklo-Kuz, 2017). There has been an increase in interest in the utilization of visual aids and other forms of instructional materials in the classroom, as they have been shown to enhance learning and improve student engagement. As a result, students pursuing a Diploma in Basic Education are encouraged to take courses in Visual art related to equipping themselves with the necessary skills to create effective and engaging instructional materials.

Using Instructional materials expedites teaching and learning activities and subsequently, the achievement of the lesson goals. In basic school pupils usually prefer lessons that allow them to interact with Instructional Materials (IM) this will keep them active and motivated. Conversely, this depends on the sufficiency and suitability of the resources selected (Tomlinson, 2014).

Educators are seeking to find solutions or ways to enhance the performance of pupils or learners. A lesson that is delivered using instructional media has the potential to achieve the lesson's objectives than the one taught without instructional media. Active participation by learners in a lesson has the potential of enabling teachers to sustain the interest of learners in the lesson and therefore, reduces teachers' workload and also leads to the achievement of the objectives of lessons. To limit the excessive dominance

of one single medium that is the textbook and verbal explanation of concepts, instructional materials will allow pupils to be fully involved in the lesson, and therefore limit the dominance of the teacher in the lesson, but allowing pupils to play the central role of the teaching and learning process which is considered as the trends of modern-day teaching and learning. This will, therefore, reinforce concepts presented to pupils **(**Muijs and Reynolds 2017)**.**

The importance of instructional materials in promoting effective teaching and learning experiences is widely acknowledged in contemporary educational paradigms (Ping, & Hong, 2021). However, there is a critical gap in the preparedness of teacher trainees to proficiently create and utilize these materials in educational settings. The existing landscape of teacher training programs inadequately addresses the practical aspects of instructional material creation, leading to a lack of emphasis on skill development and techniques necessary for the production of tailored, engaging, and effective instructional materials among teacher trainees Tekir & Akar, 2019). This gap is further exacerbated by the fact that teacher trainees often graduate without the necessary skills, techniques, and understanding required to craft and implement instructional materials that align with modern pedagogical approaches. As a result, there is a need to investigate and address the gaps in teacher trainees' competence in instructional material production by empowering them with the necessary competencies to create, implement, and evaluate instructional materials effectively, thereby enhancing their preparedness for modern teaching practices.

Objectives

1. To identify and evaluate teaching methods and strategies that are most effective for developing the skills and techniques required for the production of interactive media by teacher trainees at Gambaga College of Education.
2. To investigate the challenges faced by teacher trainees at Gambaga College of Education in acquiring the necessary skills and techniques for the production of instructional materials.

Research Questions

1. What are the most effective teaching methods and strategies for developing the skills and techniques required for the production of interactive media by teacher trainees at Gambaga College of Education?
2. What are the challenges faced by teacher trainees at Gambaga College of Education in acquiring the necessary skills and techniques for the production of instructional materials?

REVIEW OF RELATED LITERATURE

Human and non-human resources and facilities that can be utilized to facilitate, support, encourage, and advance educational activity are referred to as instructional materials. They include any materials used in the instructional process. They cover a wide range of instruments that can be used for efficient instruction. They provide a systematic strategy for organizing, carrying out, and utilizing the complete learning and communication process, as well as the use of both human and non-human resources to produce more effective training. (Haughey, Evans, and Murphy 2008)

Alorvor (2014) defines instructional resources as the tools, equipment, and other materials required for the lesson, including audio-visual aids. They are learning aids designed to make learning easier. Specific points in the delivery of the lesson must be emphasized by such materials, tools, and resources. Teaching and learning materials are very important during instructional delivery which can make learning enjoyable to pupils or learners.

According to Janovsky (2017), the instruments used in educational lessons, which include active learning and assessment, are called instructional materials. Instructional material is essentially everything a

teacher utilizes to assist him in teaching his students. Janovsky further states that instructional materials are those materials that the teacher prepares and uses to make learning easier than it would have been. IMs may be audio, visual, audio-visual, and communication resources.

The Latin word "medius," which means "middle," is where the word media originates. In principle, all types of media serve as a conduit for spreading, transporting, or delivering messages and ideas to their intended audience. The following definition of teaching media is a general one: "Any person, thing, or event that establishes the condition of the student's acquisition of information, abilities, and attitudes (Achsin 1986). In this view, the media includes lecturers, books, computers, images, and the surroundings.

Azikiwe (2007) defined instructional media as anything a teacher employs to provide a lesson that engages all five senses: sight, hearing, touch, smell, and taste. In a similar spirit, Adegun (1997) asserts that instructional media are items that are meant to aid the teacher in delivering the material more effectively and to make it easier for pupils to pick it up. Information carriers known as instructional media are created expressly to achieve goals in a teaching-learning environment. They serve a central part in teaching because they let students directly connect their surroundings to the topics they are learning, which is especially significant when students are involved in manipulating the materials. Since they are linked to resources the instructor uses to enhance the quality of his instruction, they aid in clearly illuminating concepts.

Educational Resources are tools used to facilitate the transfer of knowledge from one person to another. These teaching aids could be books, articles, project development materials, and PowerPoint presentations (visual aids). Content that presents through one or more mediums to a student the fundamental knowledge and skills of a subject covered in the educational curriculum. The phrase can refer to a book, supplementary materials, a combination of a book, workbook, and supplementary materials, computer software, magnetic media, DVD, CD-ROM, computer courseware, online services, an electronic medium, or other ways to provide information to students or help them learn using technology in general, including open-source educational content. (Richards 2001).

Delivery methods for educational lessons or, in a constructivist manner, as co-learners. It aids the learner in creating more profound personal interpretations of life and the world around him or her. represents what the student already knows and what he or she is learning (Ertmer and Newby 2013).

Skills Acquired by Teacher-Trainees to Produce Instructional Materials

Skills development in teacher education is an important component in stimulating and sustaining quality education and can make a great contribution to facilitating and transforming the acquisition of knowledge in the classroom. It also goes a long way to address the challenges and demands of meeting the quality of the presentation of concepts and improving teaching and learning (Nantwi 2014).

Darling-Hammond (2017), explains that since teacher education centered on subject-matter expertise, new teachers were accepted even if they had little to no experience with classroom management. Furthermore, discussions of teachers' classroom techniques gave little thought to the material being taught or even the part of material played in teachers' thinking. How a college student with extensive knowledge of a given subject might communicate it in a way that school children could grasp was a key source of concern for Darling-Hammond. He presumed that the technical knowledge specific to the depiction of content knowledge is a skill required for instruction. They examined pre-service teachers' understanding, conceptions, and orientations as the foundation for their knowledge of the subjects they teach to measure their knowledge in their study. Darling-Hammond investigated the domains and types of subject-matter expertise held by teachers and recommended three basic groups of subject-matter expertise: content knowledge, curricular knowledge, and Pedagogical content knowledge.

1. According to Adegoke (2003), who was cited by Asare and Nti (2014) in their article on developing the capacity of lead teacher training institutions in Ghana, Demand, integration of theory and practice, school/classroom emphasis, competency, and process evaluation are some of the fundamental ideas underlying the nature of the Basic Teacher Education Curriculum. According to Adegoke and the Institute of Education (2005), Ghana's first-cycle school teacher training curricula include the following elements:
2. Foundational academic studies, which are the subjects covered in the first cycle of instruction; Specialized personal development studies, which address communication and study skills in addition to socioeconomic themes that underpin national development.;
3. Educational studies, which put the learner first in the classroom environment and are related to the teaching-learning process and assessment; and
4. Curriculum education and practice, take care of the content study.

The analysis above indicates that the colleges of education place much emphasis on the content, curriculum, and pedagogical knowledge with minimal exposure to skills and techniques that will equip teacher trainees with skills and knowledge in the production of instructional materials. Apart from Art related course that exposes teacher trainees to basic design, colour work, and drawing. These areas are also geared toward preparing them for teaching creative art at primary schools and basic design and technology at the JHS level. As a result of this knowledge they can produce IMs, but with some challenges in them.

Using Instructional Materials for Teaching and Learning at the Basic Schools

Utilizing instructional resources makes it easier to teach and learn, which helps students achieve the lesson's goals. In elementary school, students typically choose classes that allow them to interact with IM; this will keep them engaged and motivated. However, this depends on how suitable and adequate the materials that were chosen are. (Tomlinson 2014).

This effectively means that educational resources are not chosen at random. (Kintsch and Vipond 2014). Indeed, teachers should choose the instructional resources they will utilize with great care. Oral reports necessitate improvisation and visual aids, as stressed by Brunner (1961) in Onyesom and Umoeshiet (2018). When the real thing is unavailable or hard to find, improvisation is the skill of offering an alternate or close substitute. Therefore, teachers in elementary schools must make use of teaching tools or improvise to make learning simple, entertaining, and lasting.

Therefore, teachers in elementary schools must be able to use all of the instructional resources at their disposal and adapt in situations when they are not. People remember those they have seen, touched, and even interacted with, which is an undeniable reality. The main goal of instruction is to promote efficient acquisition of knowledge and comprehension of the subject matter. (shoji, 2005). It is advisable to support the use of instructional materials in our schools that appeal to all learners' knowledge of the concepts and phenomena.

The choice and efficient use of learning and teaching tools are crucial. Teachers in elementary schools must choose, modify, and create materials to assist students' learning. Students will be able to build on with the help of careful resource selection and use, students may build on what they have learned, add to it, and learn new things, while also developing their learning strategies and skills. Biology learning and teaching resources are plentiful. There are five areas in which resources, or teaching materials, may be categorized. (Harlen 2017).

The use of educational materials. Basic school teachers can provide students with three-dimensional models in their field of study for effective teaching and learning. For example, models, interactive diagrams, visual diagrams, and game use (Okwelle and Noble 2018).

This will provide pupils with a deeper understanding of concepts. Aside from that motion pictures could be adopted by teachers which will create good stimulation for pupils understanding. Also, basic school teachers could adopt live activities that involve pupils directly in the process of instructing and learning.

METHODS

The researchers adopted the Quasi-Experimental method to be able to test the instructional materials produced to ascertain their effectiveness. This method will also enable the study and give descriptions of their causal effects on teaching and learning in the various schools under study.

In this study, the population is heterogeneous, due to the multi-sectorial characteristics of the study. The population was Year Three student-teachers on off-campus teaching practice and the pupils in basic schools of attachment and these were made up of 225 student-teachers and 562 pupils which sum up to 787 population. The target population was Year Three Student-teachers (students) offering the General program and Learners in chosen basic schools in the study area. The target population of the study was 492 made up of 120 student-teachers and 372 pupils.

Table 1 shows the breakdown of the target population.

Name of School	No. of Teacher- Trainees	No. of Pupils	Total
Gambaga Presby Primary and JHS	24	70	94
Gambaga D/A Primary and JHS	32	90	122
Nalerigu D/A Primary and JHS	22	60	82
Naa-Sheriga and Naa-Bongu R/C Primary and JHS	22	70	92
Zobzia Primary and JHS	20	82	102
Total	120	372	492

RESULTS AND DISCUSSION

Result

The Visual Art Related in the Diploma programme provides a foundation for the study of vocational skills. It covers principal ideas normal to all Visual Art subjects to give wide-based information to generalist teacher-trainees. Teacher-trainees are therefore exposed to lettering, basic design, colour work, and many more (Revised Syllabus 2014). The study, affirms that 80.3% of respondents indicated their knowledge of IMs was from Art Related, 9.2% claimed they knew about IMs from Mathematic, 3.9% from other subject areas collectively, and 2.6% indicated knowledge of instructional materials was from Catering and Educational Studies.

From this, it is evident that 90% of respondents have not had practical training in the production of instructional materials, and 29% of respondents indicated they have practical exposure to the production of IMs. This percentage attests to the fact that the percentage of teacher-trainees (students) offering Art Related as an elective is very minimal as the figure is almost corresponding to respondents who offered Art as an elective in the second year.

Developing skills and techniques for the production of instructional materials is essential for teacher trainees, as it prepares them to effectively teach their future students. To develop these skills and techniques, teacher trainees can be taught how to design and create effective instructional materials, which are engaging and appropriate for their student's learning styles and abilities.

The following topics were observed by the authors the digestive system, Reproductive system, Chemical Hazard Symbols, Farming Systems Matter, and Parts and functions of a Flower. Sample of IMs found at Nalerigu D/A Primary, & J.H.S Zobzia Primary & J.H.S, Gambaga Presby Primary & J.H.S, and Gambaga J.H.S were cardboard illustrations, chalkboard illustrations, sachets water rubbers, improvised materials that were directly not linked to the topic.

The language of instruction for teaching was English but sometimes the teacher–trainee comes in with Mampruli. Though at the J.H.S. pupils still have challenges with speaking and understanding the English language.

Discussion

Effectiveness of the training content, tests were conducted. This IM was not used to observe this issue prior. Students may identify the components of the flower and put them in their proper locations on the flower by using the interactive instructional message (IM) that was created. As a result, this gave students a more central role in the instruction and learning process.

The approach used was activity and conversation; students were asked to talk about what they had seen on the instant messenger and were also asked to work in groups to identify and then fix the various components of the instant messenger. Because they were so excited to see the IM, students were also really motivated to participate in the lecture. Additionally, because the concepts to be taught were more understandable and student-centered, the instructional materials gave the teacher-trainee confidence when giving the lesson.

An evaluation of the IM on light refraction was conducted. There are 41 students enrolled in the class (41). The initial observation was that the teacher-trainee taught this subject primarily through pictures on the chalkboard with little help from the students. The educational resources that were created and provided gave students a genuine sense of the rectilinear characteristics of light. Students helped set up the refraction stands so they could test the idea that light travels in a straight line by using a touch light.

Students in the classroom were eager to learn and the environment was motivating. Students conducted experiments in groups and presented their findings to the class, thus making the instruction student-centered. In contrast to his first session, where he had to devote instructional time to show the diagram on the chalkboard, the teacher trainee also reported that the suitable IM did not waste the teaching time.

With thirty (30) students enrolled, the designed and produced IM on Sources of Water was assessed. In an initial lesson observation, the teacher-trainee made use of cardboard illustrations. The drawings in this instructional material had a problem in terms of their likeness to the desired image, even though the IM employed by the teacher-trainee was on the subject. Additionally, the IM's labeling was done incorrectly, making it difficult to notice them from the back of the class. Since this educational content was only intended to be viewed, students were unable to engage with it.

Clearer labeling was evident in the educational material created by the researcher and participants, and it was seen from every aspect of the classroom. Because the educational materials' visuals were identical to those found in nature, students could readily make the connection between what they saw in nature and the images on the materials. Students could also engage with the IM by identifying different parts and fixing them on the screen. The lesson became more learner-centered as a result of this approach. Because the subject was made simple to explain, it also lessened the teacher workload. Trainee because of the nature of the teaching materials, students were extremely motivated, which helped the teacher-trainee accomplish the lesson's goals. This was clear from the way students answered questions aloud and from how many students were willing to participate in class discussions.

Thirty students make up class six at this school, where testing of the course materials was conducted (30). During the initial lesson, the teacher-trainee made use of a model globe. Despite Ghana and Her Neighbors being mentioned in this teaching resource, other nations on the planet might divert students' attention. Furthermore, not every student gets the chance to see it in its entirety.

However, the IM created and made for this subject gave students a clear perspective of Ghana and its neighbors without drawing attention to other nations. The teacher-trainee guided the class discussions by asking students to identify the various components after they were removed. Following that, students take turns identifying various sections. As a result, learning and teaching became very interactive and child-centered. Additionally, students had a high level of motivation, and the teacher-oral trainee's assessment of the lesson revealed that students had grasped the material. Additionally, the IM lessened the teacher-burden trainee's and increased his self-assurance in instructing the subject.

The methods that were adopted by teacher-trainees in this school were mainly cardboard illustrations and models. Materials used were cardboard, pencil sketches, and markers used in labeling. The techniques that were adopted in preparing the Instructional Materials were mainly illustrations and freehand lettering in labeling the instructional materials.

The Visual Art Related to the Diploma of Basic Education programme provides a foundation for the study of vocational skills. It covers principal ideas normal to all Visual Art subjects to give wide-based information to generalist teacher-trainees. Student-teachers are therefore exposed to lettering basic design and colour work (Institute of Education University of Cape Coast 2014). Figure 4.3 therefore, affirms that 80.3% of respondents indicated their knowledge of IMs was from Art Related, 9.2% claimed they knew about IMs from Mathematic, 3.9% from other subject areas collectively, and 2.6% indicated knowledge of instructional materials was from Catering and Educational Studies.

One of the challenges identified is the absence of a resource center within the college. A higher percentage of 97% of respondents indicated that there is no resource center in the college where they could borrow or obtain IMs for teaching and learning. 3% of respondents indicated the presence of a resource center where they could borrow IMs for teaching and learning.

As a teacher education institution, there is the need to have a resource center to enhance teaching and learning, this could also serve the schools in the community at large, as some of these schools are partner schools where student teachers do their off-campus teaching practice. Kay (2017), demonstrates how the addition of learning resource centers to the teaching and learning process benefits pupils. According to Kay, these centers serve as a space to introduce, reinforce, and broaden students' learning.

CONCLUSION

The findings indicate that the structure of the teacher education curriculum emphasizes the use of IMs, but there is no clear-cut course that is geared towards practical training in the production of instructional materials. Therefore, this will limit teacher trainees' knowledge in producing their IMs during teaching practice and after training.

The findings also point to the fact that teacher-trainees have the zeal to learn how to produce IMs look at the effective participation level exhibited by the participants. In addition, the IMs produced enhanced student participation in the lesson, as they were actively involved in the lesson by interacting with the IMs. This goes to affirm the view of Mwangi (2010), which indicates that, IMs encourage and maintain enthusiasm for studying by exposing students to physical and social reality. Mwangi further states that IM use in the teaching and learning process encourages concept retention and increases learning.

Limitation

The findings of this study help promote teaching and learning at the primary level. This being the first time teacher trainees are undergoing such training, they are likely to have challenges in the production. Therefore, need more support for future research.

Conflict of interest statement

The authors declare that there is no interest in conflict, and all reference materials were fully acknowledged.

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