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(RESEARCH ARTICLE)

The influence of some curriculum implementation factors on science graduates' employability competencies in Cameroon

Gara Andreas Tawum *

Department of Curriculum and Evaluation, Faculty of Education, University of Yaounde 1, City of Yaounde, Centre Region, Cameroon.

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Abstract

This study sets out to investigate the influence of some curriculum implementation factors on the employability competencies of science graduates in Cameroon. The problem was the lack of competencies by science graduates after years of study and completion leading to their low employment rate. The target population of this study were natural science graduates from Cameroon state universities. The research design used was a descriptive survey with a quantitative approach. A questionnaire was designed and used to collect primary data. This questionnaire was addressed to natural science graduates registered at the National Employment Fund (NEF) agencies in Cameroon for the year 2024. The respondents were selected using a simple random sampling technique. With a sample of 318, data was collected and analysed using the Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive results were presented in means and standard deviation and Spearman rank correlation was used to test the research hypotheses. Results of the analysis revealed that teaching styles had (r = 0.130); physical facilities had (r = 0.203) and teaching staff characteristics had (r = 0.176) on science graduates' employability competencies, with all having significant p-values. This shows that all 3 specific hypotheses were accepted, so thus the study. Based on the results, the researcher humbly suggests that university lecturers ameliorate their teaching styles, higher institutions look into the state and availability of physical facilities needed to implement the study program and the Ministry of Higher Education follow up and empower teaching staff with what is necessary in ensuring that the curriculum for natural science program in Cameroon state universities is well implemented so that graduates can have the necessary employability competencies from it.

Keywords: Competencies; Curriculum Implementation; Employability; Science graduates

1. Introduction

Knowledge acquisition is possible through curriculum. Curriculum types designed to guide, monitor, and evaluate the quality of instruction are the most well-known. They are essential to planning and controlling. According to this definition, a curriculum is a compilation of statements, documents, and resources that are typically produced by groups of experts in a school, university, publishing house, or ministry of education. These resources act as a road map for accomplishing certain learning goals, which could be at school, national, regional, or institutional levels. The curriculum can be seen as representing the best grasp of the current state of knowledge and how it can be taught, in addition to knowing how to set up a teaching program efficiently. It is recognised as a technical or semi-scientific framework for teaching and learning that has been backed by current theory, research, and expert knowledge (Pinar and Irwin, 2004). Curriculum implementation explains how educators use the materials included in a particular curriculum to carry out instruction. Curriculum designs typically offer lesson plans, instructional guides, scripts, and assessment choices connected to a set of goals. According to Wilkes and Bondi (2014), these designs emphasise consistency in order to support teachers to implement and uphold the structure of the curriculum so as to achieve a variety of goals.

* Corresponding author: Gara Andreas Tawum

1.1. Statement to the Problem

The government of Cameroon has undertaken a number of initiatives to make university curricula more professional and market-driven. One of such initiatives is Article 2 of Law No. 005 of 16 April 2001, which outlines the guidelines for Higher Education (HE) in Cameroon, stating that "the HE realm shall be assigned a basic mission of producing, organising and disseminating scientific, cultural, professional, and ethical knowledge for development purposes" (MINESUP, 2001). Despite these initiatives, graduates who lack the skills required to create or place jobs continue to leave the country in a barren state. Since the curriculum teaches employability competencies, it is necessary to look at how it is implemented in this challenge. It seems that the intended competences are not being met through the curriculum implementation. Graduates are therefore seen as deficient.

The main problem is usually why students are trained if they intend to remain unemployed or underemployed after graduation. Is it because graduates are not being adequately prepared for the needs of the work market by the instructional methods? Do these graduates need to be trained in inadequate or inefficient physical facilities? Or is the problem the teaching staff's qualities? This issue has led to young people in Cameroon engaging in unwarranted searches for better prospects abroad, casting a terrible light on universities that are supposed to equip students with employment skills.

1.2. Research Objectives

- To assess how teaching methods at some Cameroon state universities affect the employability competencies of science graduates.
- To investigate how some Cameroon state institutions' physical facilities, affect the employability competencies of science graduates.
- To examine into how some Cameroon state universities' teaching staff characteristics affect the employability competencies of science graduates.

2. Literature Review

2.1. Teaching styles

The ideas, behaviours, and demands of instructors that surface in an educational setting are referred to as their teaching styles (Grasha, 1996). Teaching methods foster knowledge, abilities, and values related to the subject. A teacher's teaching style is a recognisable collection of behaviours they exhibit in the classroom. A well-implemented curriculum through appropriate teaching methods obviously leads to better acquisition of competencies for employability. In the teaching process, there are two different kinds of teaching styles. The permissive style and the autocratic style.

A- Autocratic teaching style: It is either content-centred or teacher-centred instruction (Grasha, 1996). Students are merely passive listeners in this technique, which enables the teacher to be more active. This teaching approach gives the instructor total authority over the classroom. It is simply the synthesis of different teaching techniques, strategies, and tenets. A number of these techniques fall under the category of autocratic teaching, including the tutorial, textbook, storytelling, lecture, and other techniques. In an autocratic teaching method, the teacher's main responsibility is to impart knowledge to his students; students are not permitted to express themselves, raise questions, or take charge of their education. Teaching methods that are autocratic include:

- Lecturing: Lectures are the oldest instructional method still in use in educational institutions. The information exchange in this type of instruction is one-way. This method of instruction requires students to simply listen to the lecture and take notes as necessary, then organize and compile the information (Umar, 2012).
- Team Teaching: Team teaching is when a group of teachers work together, on a regular basis, and with a purpose to help a group of students learn (Villa, Thousand & Nevin, 2004). In team teaching, educators collaborate to establish course objectives, create a syllabus, instruct students, and assess their progress.
- Tutorial: The tutorial teaching approach is a continuation of the lecture style. It is remedial instruction that is highly customised. Following the normal class lecture, the instructor looks for students who are struggling. Based on related issues, these students are separated into various groups. The teachers then make an effort to design lessons that are relevant to each student group's needs, skills, and talents.

B- Permissive style of teaching: It permits a high level of student participation in classroom interactions and a low level of teacher participation in the teaching and learning process. Because pupils are permitted to work independently, this teaching approach is referred to as democratic. Their ability to increase student engagement over an autocratic teaching

style is one of their main advantages. Students are given the chance to assume responsibility for their own education through a permissive teaching style. It is focused on the pupil.

Following are permissive style of teaching –

- Group or Panel Discussion: Members of the group actively participate in all facets of the teaching-learning process in this structured dialogue (Johnson & Johnson, 1999). It is a process in which students and teachers share opinions and ideas. Every group member is urged to take part in every topic of conversation. It is a democratic forum for group members to express their opinions.
- Brainstorming: The teacher uses brainstorming as a teaching strategy in which all students can share their opinions on a single subject (Osborn, 1953). Teaching is carried out through brainstorming based on the "concept of individual differences." All students are able to engage in this educational method. Divergent thinking is necessary.
- Project Method: This is a contemporary teaching approach that is a recent addition to the teaching profession (Thomas, 2000). With this approach, instructors serve as mentors rather than bosses until the assignment is finished. It is making a person more aware of the need to fully participate in the endeavour. The project work offers both incidental and actual knowledge in addition to learning about the topic and subject at hand.

2.2. Physical facilities

The raw ingredients that an organisation uses to accomplish its goals and objectives are its physical facilities. These are common resources created by humans that enable us to carry out our daily tasks much more quickly and easily. They are things that we can feel, move, smell, see, and more. Desks, seats, lecture halls, labs, libraries, computer labs, staff offices, and playgrounds are a few examples. According to Kotler & Armstrong (2010) in Research Gate, physical facilities are assets that the business organisation has access to, such as buildings and other equipment required for daily operations. In the context of education, a physical facility is used for the variables being studied. Therefore, aside from people, physical facilities are all the structures that make up a school system. All instructional and non-instructional facilities are considered physical facilities in schools. The availability and state of these facilities determines how graduates will capture employability competencies.

According to Bandele & Faremi, 2012; Umunadi, 2012; Tshabalala & Ncube, 2014, in order to achieve the desired educational outcomes, the teaching and learning process requires pertinent tools, materials, and equipment such as laboratories, lecture halls, and reference books. For example, textbooks can be used to develop instructional content, and lecture halls, workshops, and labs offer a supportive environment where students can engage with the material to achieve the desired educational outcomes, which include covering the syllabus and developing employability and lifelong skills. The quality of curriculum implementation is influenced by the interaction between teaching and learning resources and physical facilities. Additionally, in order to accomplish the desired educational outcomes, the framework sees curriculum implementation as a combination of the teaching and learning process, content, support services, and monitoring and feedback activities (Ebenehi, Rashid, & Bakar, 2016). Like other resources, physical facilities must be used, allocated, and managed carefully in order to maximise support for educational reform goals, particularly when a number of players both inside and outside the education sector have conflicting demands.

2.3. Teaching staff characteristics

Through the design and execution of its curricula, education plays a crucial role in guaranteeing both national and global survival and growth. At the start of the twenty-first century, shifting from knowing to doing is the biggest obstacle to curriculum implementation. A review of teachers and classrooms is essential to guaranteeing the effectiveness of the educational system and the development of 21st century abilities. The curriculum is designed to address societal issues, but regrettably, as these issues evolve, the demands placed on the educational system might become too much to handle.

A paradigm for comprehending the essential elements of teacher quality and their connections to student learning outcomes was introduced by Goe (2007). He asserts that teacher quality encompasses both the credentials and traits (inputs) of teachers that impact their teaching (process) and the results of their pupils (e.g., motivation and achievement). Teaching staff characteristics were operationalised in this study using teacher attributes like self-efficacy and credentials like job experience, teacher education level, and participation in professional development activities. According to Doherty (1997), the book Education and Training for the 21st Century sparked a great deal of interest in the formal education sector's "quality" issues. However, the topic of teaching quality has gained new life, primarily in higher education, thanks to more recent research based on fresh viewpoints and the participation of a larger range of stakeholders and international organisations in the matters of evaluating, measuring, and assuring educational quality (Bertolin, 2009). The characteristics of the teaching staff thus have a great role in competence building in graduates.

Concerns about employability are particularly prevalent amongst students and recent graduates who hope to use their skills to land and keep a good job after graduation. The capacity to land a job, keep it, and find another one if needed is known as employability. It all comes down to having the ability to find and maintain rewarding employment. Nonetheless, employability competences including laboratory practices, scientific writing and reporting, teamwork and collaboration, research and experimentation, and entrepreneurship skills, to mention a few, will result from properly implementing the curriculum. Science graduates can find employment with ease if they possess these competencies.

2.4. Research Methodology and Procedures

This study was carried out in Cameroon with the target being science graduates from state universities. The accessible population are graduates registered at some National Employment Fund (NEF) agencies in Cameroon for the year 2024. The researcher made use of National Employment Fund branches in major cities such as Yaoundé, Douala and Limbe, harbouring major National Employment Fund agencies and where graduates are believed to settle most after their studies in search of a job. This study employs a descriptive survey research design. A questionnaire was used to collect primary data. Participants of the study were selected using a simple random sampling technique, and we had a sample of 318. Participants through the questionnaire evaluated the teaching styles, the physical facilities and teaching staff characteristics that could influence science graduates' employability competencies. The primary data collected was analysed using the Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive results were presented in means and standard deviation while Spearman rank correlation was used to test the research hypotheses.

3. Results

Table 1 Teaching styles

S/N	Item	n	Mean	Standard deviation
1	The lectures for understanding required contents	318	3.7075	0.99177
2	The Practical work in laboratories	318	3.4623	1.29187
3	Our Course and workload distribution during the week	318	3.2893	1.31166
4	My Fieldwork Participation	318	3.3962	1.68129
5	The Opportunities for international cooperation	318	2.9969	2.10227

Source: Field data, 2024.

In the table above, it is observed that in the item "The lectures for understanding required contents", the mean is low (3.7075), generally negative or disagreeing responses and standard deviation (SD) = 0.99177. The small SD suggests that responses are consistent. For "The Practical work in laboratories", the mean is low (3.4623), generally negative or disagreeing responses and standard deviation (SD) = 1.29187. The moderate SD suggests that responses are somewhat consistent. Looking at the item "Our Course and workload distribution during the week", the mean is low (3.2893), generally negative or disagreeing responses and standard deviation (SD) = 1.31166. The moderate SD suggests that responses are somewhat consistent. Moreover, it is seen that in the item "My Fieldwork Participation", the mean is low (3.3962), generally negative or disagreeing responses and standard deviation (SD) = 1.68129. The large SD suggests that responses are more variable. Finally, "The Opportunities for international cooperation", the mean is low (2.9969), generally negative or disagreeing responses and standard deviation (SD) = 2.10227. The large SD suggests that responses are more variable.

Table 2 Physical facilities

S/N	Item	n	Mean	Standard deviation
1	The Library for studies	318	3.3742	2.01764
2	The seats for learners		3.0975	1.30514
3	Our class writing board	318	3.8208	1.41509
4	Our laboratories and equipment	318	2.4528	1.35590
5	The sound system for larger classrooms	318	3.6509	1.38748

Source: Field data, 2024.

According to the results presented in the table above, the item "The Library for studies", the mean is low (3.3742), generally negative or disagreeing responses and standard deviation (SD) = 2.01764. The large SD suggests that responses are more variable. For "The seats for learners" show the mean is low (3.0975), generally negative or disagreeing responses and standard deviation (SD) = 1.30514. The moderate SD suggests that responses are somewhat consistent. Looking at the item "Our class writing board", the mean is low (3.8208), generally negative or disagreeing responses and standard deviation (SD) = 1.41509. The moderate SD suggests that responses are somewhat consistent. On the item "Our laboratories and equipment", the mean is low (2.4528), generally negative or disagreeing responses and standard deviation (SD) = 1.35590. The moderate SD suggests that responses are somewhat consistent. Finally, "The sound system for larger classrooms", the mean is low (3.6509), generally negative or disagreeing responses and standard deviation (SD) = 1.38748. The moderate SD suggests that responses are somewhat consistent.

Table 3 Teaching staff characteristics

s/n	Item	n	Mean	Standard deviation
1	The Assiduity by teachers	318	4.1635	1.02261
2	The Teachers Punctuality	318	4.2642	0.93615
3	The Communication both verbally and non-verbally	318	4.1195	1.01946
4	Lecturers Preparedness for lessons	318	4.2987	1.01816
5	The Accessibility of teaching staff	318	3.8774	1.11516

Source: Field data, 2024.

From the table above, it is observed that in the item "The Assiduity by teachers", the mean is moderate (4.1635), neutral or mixed responses and standard deviation (SD) = 1.02261. The moderate SD suggests that responses are somewhat consistent. On the item "The Teachers' Punctuality", the mean is moderate (4.2642), neutral or mixed responses and standard deviation (SD) = .93615. The low SD suggests that responses are consistent. For "The communication both verbally and non-verbally", the meaning is moderate (4.1195), neutral or mixed responses and standard deviation (SD) =1.01946. The moderate SD suggests that responses are somewhat consistent. Looking at "Lecturers Preparedness for lessons", the mean is moderate (4.2987), neutral or mixed responses and standard deviation (SD) =1.01816. The moderate SD suggests that responses are somewhat consistent. Finally, for "The Accessibility of teaching staff", the mean is low (3.8774), generally negative or disagreeing responses and standard deviation (SD) =1.11516. The moderate SD suggests that responses are somewhat consistent.

Table 4 Employability competencies

S/N	Item	n	Mean	Standard deviation
1	I am good at laboratory work techniques	318	3.8742	1.22406
2	I am good in scientific writing and reporting	318	4.1352	1.52909
3	I have teamwork and collaboration skills	318	4.8553	1.08814
4	I am good at research and experimentation	318	3.9969	1.27707
5	I have entrepreneurial skills	318	4.3239	1.40036

Source: Field data, 2024.

The results presented in the item "I am good at laboratory work techniques". The mean is low (3.8742), generally negative or disagreeing responses and standard deviation (SD) =1.22406. The moderate SD suggests that responses are somewhat consistent. For the item "I am good at scientific writing and reporting", the mean is moderate (4.1352), neutral or mixed responses and standard deviation (SD) =1.52909. The large SD suggests that responses are more variable. Looking at the item "I have teamwork and collaboration skills", the mean is moderate (4.8553), neutral or mixed responses and standard deviation (SD) =1.08814. The moderate SD suggests that responses are somewhat consistent. Results presented in the item "I am good at research and experimentation". The mean is low (3.9969), generally negative or disagreeing responses and standard deviation (SD) =1.27707. The moderate SD suggests that responses are somewhat consistent. Finally, for the item "I have entrepreneurial skills", the mean is moderate (4.3239), neutral or mixed responses and standard deviation (SD) =1.40036. The moderate SD suggests that responses are somewhat consistent.

Table 5 Correlations between teaching styles and employability competencies

Correlations				
			Teaching_Styles	Employability_Competencies
Spearman's rho	Teaching_ Styles	Correlation Coefficient	1.000	0.130*
		Sig. (2-tailed)	.	0.021
		n	318	318
	Employability_ Competencies	Correlation Coefficient	0.130*	1.000
		Sig. (2-tailed)	0.021	.
		n	318	318
*. Correlation is significant at the 0.05 level (2-tailed).				

Source: Field data, 2024.

The correlation table above shows the spearman's correlation value of r = 0.130, which indicates a positive very low correlation between teaching styles and science graduates' employability competencies. This is equally based on the fact that the level of significance is 0.021, which is largely less than 0.05 (alpha), the standard error margin (r = 0.173, p= 0,021 ≤ 0,05). The correlation falls within the range of a positive correlation since it moves towards 1. This permits us to confirm Ha: there is a correlation between teaching styles and science graduates' employability competencies while Ho is rejected. Thus, at an error margin of 5%, RH1 is confirmed. Therefore, the unsatisfying Science graduates' employability competencies event observed among graduates is strongly blamed on teaching styles.

Table 6 Correlations between physical facilities and employability competencies

Correlations				
			Physical_Facilities	**Employability_Competencies**
Spearman's rho	Physical_Facilities	Correlation Coefficient	1.000	0.203**
		Sig. (2-tailed)	.	0.000
		n	318	318
	Employability_ Competencies	Correlation Coefficient	0.203**	1.000
		Sig. (2-tailed)	0.000	.
		n	318	318
**. Correlation is significant at the 0.01 level (2-tailed)				

Source: Field data, 2024.

Physical facilities and scientific graduates' employability competences have a positive, low association, according to the correlation table above, which displays the spearman's correlation value of r = 0.203. The standard error margin, or alpha, is predicated on the fact that the threshold of significance is 0.000, which is much less than 0.05 (r = 0.203, p = 0,000 ≤ 0,05). Since it approaches 1, the correlation is within the range of a positive correlation. This enables us to reject Ho and validate Ha: there is a relationship between the employability competencies of science graduates and physical facilities. RH2 is so validated with a 5% error margin. Thus, there is a statistical correlation between the availability and use of physical facilities and the unsettling employability qualities observed among science graduates.

Table 7 Correlations between teaching staff characteristics and employability competencies

Correlations				
			Teaching_Staff_ Characteristics	Employability_ Competencies
Spearman's rho	Teaching_Staff_Characteristics	Correlation Coefficient	1.000	0.176**
		Sig. (2-tailed)	.	0.002
		n	318	318
	Employability_Competencies	Correlation Coefficient	0.176**	1.000
		Sig. (2-tailed)	0.002	.
		n	318	318
**. Correlation is significant at the 0.01 level (2-tailed).				

Source: Field data, 2024.

The spearman's correlation value of r = 0,176, as displayed in the correlation table above, suggests a positive but very weak relationship between the employability competences of science graduates and the attributes of the teaching staff. This is also predicated on the fact that the standard error margin, or alpha, is 0.002, which is significantly less than the level of significance, which is 0.05 ($r = 0.176$, $p = 0.002 \leq 0.05$). Since it approaches 1, the correlation is within the range of a positive correlation. This enables us to reject Ho and validate Ha: there is a relationship between the employability competencies of science graduates and the teaching staff characteristics. RH3 is so validated with a 5% error margin. This indicates that the employability competency issues that science graduates have are statistically caused by the attributes of the teaching personnel.

4. Discussions

Based on hypothesis 1: In some Cameroon state universities, teaching styles have a major impact on the employability abilities of science graduates. The results indicate a substantial positive link between employability competences and teaching styles ($r = 0.130$, $p < 0.05$). This research implies that employability competences rise in tandem with teaching styles. The strong correlation between employability competences and teaching styles implies that employability competencies are significantly predicted by teaching styles. Teaching styles are supported by Jerome Bruner's Social Constructivism (1915–2016). One well-known educational paradigm that has been fervently supported for many years is constructivism.

Constructivism is thought of as a teaching approach where students actively participate in their own education. Through project-based learning or interactive teaching techniques, students build knowledge from their own experiences. Since they are members of society, how students interpret their experiences is influenced by the social context in which they live. This setting pushes students to see beyond their immediate experiences and make future predictions while taking environmental cultural elements into account. The focus of educational growth in a constructivist classroom is on the students, not the teacher. In order to take advantage of the utilisation of essential teaching styles that can help students develop employability skills, this idea is incorporated into the study.

Looking at hypothesis 2: In certain Cameroon state universities, the employability competencies of science graduates are impacted by physical facilities; the results indicate a substantial positive link between employability competencies and physical facilities ($r = 0.203$, $p < 0.05$). This research implies that employability competencies rise accordingly with physical facility improvements. The correlation between employability competences and physical facilities implies that physical facilities are a key indicator of employability competencies.

This study also adopts the social learning theory by Albert Bandura. Bandura (1986) believes that learning takes place in a social context; that is, through interaction. Children learn about somebody or something, from something or somebody. This study guides us to understand learners' interaction with the necessary physical facilities in the curriculum implementation process. If the facilities are not available or insufficient following learners need, how then will they interact with them? Take the case of a situation where learners are crowded on a single post of work, about 15 of them, whereas it was meant for just 1 person. There is therefore little or no interaction with the learning material to

gain competencies expected in the field of work. This theory therefore comes into place to support learners' interaction with the study environment to gain competencies.

Following hypothesis 3: In some Cameroon state universities, the employability competences of science graduates are influenced by the characteristics of the teaching staff. The results indicate a substantial positive link between employability competencies and teaching staff characteristics ($r = 0.176$, $p < 0.05$). This research implies that employability competencies rise in in accordance with improvements in instructional staff characteristics. The correlation between employability competences and teaching staff attributes implies that employability competencies are significantly predicted by teaching staff attributes.

5. Conclusion

Conclusively, curriculum implementation is the pathway to acquiring employability competencies. The surrounding factors as indicated in this work are strong indicators to determine the output of science graduates and their performance at work. Results of the study have indicated that teaching styles, physical facilities and teaching staff characteristics significantly influence employability competencies in science graduates. The case study was identified to be lacking, not matching to meet up with graduates' needs. Therefore, an expectant decrease in the rate of employment. Responses from participants show that the teaching styles employed are not the best for responding to the issue at stake; the physical facilities were revealed to be inadequate and outdated to meet up with current challenges; the teaching staff characteristics are short of the qualities to facilitate the implementation of the curriculum. These indicators overtly inform the curriculum that its outcome is doubtful. If graduates' satisfaction is to be given priority, urgent attention is necessary.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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