

Article

Quality Assurance in Curriculum Development in Ghana's Higher Education System: A Case Study of UMaT

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Abstract: Over the past decades, quality assurance has received significant prominence in higher education management across the world. While the concept is pertinent to all areas of higher education management, nowhere is it considered more crucial than in curriculum development, given the importance of curriculum in supporting students to achieve the needed learning outcomes. In this study, we explored how quality is ensured in curriculum development in Ghana, using a STEM university, University of Mines and Technology (UMaT), as a case study. We specifically examined the procedure for curriculum development in the university, how quality assurance is ensured during the process, and the challenges associated with the process. We explore the case using qualitative techniques, particularly in-depth interviews. Fourteen (14) participants were purposively sampled from four (4) functional levels responsible for curriculum development in the university. The study found that the quality of curriculum in UMaT is largely determined by both national and institutional quality assurance frameworks. The major challenges that hamper quality assurance are the need to design curriculum at a shorter notice to fulfil accreditation requirement, lack of experts to support curriculum development, and less consultation with other relevant stakeholders as required by the regulator, Ghana Tertiary Education Commission (GTEC).

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1. Introduction

The need to train the next generation for human capital development is imperative. There is the need to train students to become the workforce for economic growth and national development. The blue-print for any educational enterprise is often captured in the curriculum. The need for any curriculum to serve the national purpose is very critical in educational planning. Higher education and its programmes must be fit for purpose and must pass the quality test for higher education.

Over the past decades, quality assurance has received significant prominence in higher education management across the world [1, 2, 3]. While the concept is pertinent to all areas of higher education management, nowhere is it considered more crucial than in curriculum development [4, 5]. This is because curriculum development is the fulcrum of any educational system, as it directly concerns the courses taught in schools, which influences students' development. Emphasizing the importance of quality assurance in curriculum development [6], for instance, noted that curriculum development is at the centre of national development, as it equips students with the skills needed to become future decision-makers, thereby making quality assurance the driving force to ensuring that graduates remain relevant in their societies. Similarly [7], averred that quality assurance in curriculum development helps ensure that curricula are in tangent with the

rapidly increasing dynamics in economic globalization, information technology, socio-political demands, and the international market.

Ghana is no exception to the growing reform movement towards instituting quality assurance in higher education management. The nation's quest towards this drive became apparent in the late 1980s, following the establishment of the University Rationalisation Committee in 1987 by the Provisional National Defence Council (PNDC) government, with the responsibility to come up with the policy framework for reforming tertiary education in Ghana. The Committee submitted its report with about 166 recommendations [8]. This led to the establishment of two institutions: the National Accreditation Board (NAB) and the National Council for Tertiary Education (NCTE) in 1993 to regulate and ensure quality tertiary education in the country. These two institutions were merged in 2020 to form the Ghana Tertiary Education Commission (GTEC) by the Education Regulatory Bodies Act, 2020 (Act 1023) [9]. Since their birth, these institutions have introduced several procedures to enhance the quality of tertiary education in Ghana. Despite the depth of contributions of these institutions, studies still point to several loopholes in the country's higher education management as far as quality assurance is concerned. For instance, in their work on *Quality Assurance in Ghanaian Higher Education Institutions* [10] argued that despite the existence of the above-mentioned institutions, there is still a paucity of ineffective quality assurance frameworks, coupled with weak systems and affiliation problems. A key revelation from the study, however, was the absence of an effective framework for quality assurance in curriculum development in the country. Unlike the basic and secondary school levels, where curricula are developed centrally by the National Council for Curriculum and Assessment [NaCCA], tertiary institutions in Ghana are usually responsible for developing their curricula, sometimes involving relevant external actors [11]. The curricula are subsequently presented to GTEC for perusal and approval. This is a common practice in most African countries too [12, 13, 6].

The above narratives imply that the success or quality of any curriculum in Ghana is largely dependent on the skills and knowledge of individual higher educational institutions (HEIs) to forge a pragmatic curriculum that can guarantee student development. There is a need to examine how quality is assured in higher educational institutions with respect to how tertiary institutions in Ghana ensure quality assurance in their curriculum development activities. This becomes even more important as there appears to be little empirical evidence on how tertiary institutions in Ghana inculcate quality assurance in curriculum development. The study attempts to examine this phenomenon by using the case study design to explore the issue from the perspective of a STEM (Science, Technology, Engineering, and Mathematics) university in Ghana: The University of Mines and Technology (UMaT), Tarkwa. Although focusing on UMaT alone does not ensure a broad generalization about quality assurance in curriculum development across Ghana, it provides a case for appreciating the phenomenon for future studies and generalization in respect of inculcating quality standards into their curriculum development process. Moreover, as STEM education has become essential in many countries, this study adds to extant studies highlighting the importance of quality assurance in curriculum development to ensure quality STEM education (e.g., [14,15]). The following questions guide the study:

1. What is the procedure for curriculum development at UMaT?
2. How is quality assurance ensured in curriculum development at UMaT?
3. What are the challenges in ensuring quality assurance in curriculum development at UMaT?

2. Review of Related Literature

2.1. Theories of Curriculum Development

Since the 1970s, many theories have been developed to explain how a teaching environment should look like and what should be the focus when curricula are being developed. [16] are often cited as the first to develop theories of curriculum, which they classified under five categories: technology, cognitive process, academic rationalism, self-actualization, and reconstruction-relevant theories. Technology curriculum theory emphasizes the systematic planning of curriculum, where the teacher systematically sets the learning objectives and achieves them. Cognitive process theory focuses on the improvement of students' mental processes so that they can develop problem-solving and critical-thinking skills. Academic rationalism theory focuses on understanding the concepts and main ideas of the discipline. Self-actualization theory is concerned with students' growth and personal development, and reconstruction-relevant theory is concerned with solving social and community problems. [17] also classified curriculum theories under five groups: traditional, experiential, discipline, behavioural, and constructivist theories. Traditional curriculum theory is concerned with the transfer of cultural heritage. The experiential theory argues for a broader curriculum that does not only focus on the students' experience in and outside school but also other unanticipated consequences they might encounter. The discipline curriculum theory emphasises the importance of learning the fundamental concepts of a discipline, which would offer students the grounding to derive the rest of the knowledge. Behavioural curriculum theory argues for a shift away from content to focusing on behaviours that students should learn. Finally, constructivist curriculum theory argues for a curriculum that allows students to "construct their own knowledge based on what they already know and to use that knowledge in purposeful activities requiring decision making, problem-solving, and judgments" (p.67).

Other theories include Kliebard's humanist [18] (focuses on the provision of liberal education for all students), child study (arranging curricula in order of the child's natural development), and social efficiency curriculum theories (equipping students with skills needed for future roles). There is little space to discuss others like [19] knowledge-centred, learner-centred, and society-centred curriculum theories, and [20] liberal, systematic, existentialist, radical, pragmatic, and deliberative curriculum theories, all of which provide important insights to curriculum development. It is worth noting, however, that despite the different classifications, all theories seem to emphasise similar points. As noted by [21], they all stress the importance of organizing curricula around the interests and needs of students as well as communities. Further, they emphasise the point that curricula should be aimed at equipping students with observable skills acquired through some performance standards. An examination of the policies of the GTEC indicates a template for presenting programme for accreditation but not a curriculum framework backed by any of these theories and or national philosophy of education.

2.2. Curriculum Development

The term "curriculum" has been defined as "all the planned learning opportunities offered to learners by the educational institution and the experiences learners encounter when the curriculum is implemented" [22, p. 4]. A usual curriculum document outlines the scopes of the courses, the sequence of delivery, the teaching methods to be employed, the workload for each course, and the competencies of the course instructors [23]. Curriculum development explains the various procedures involved in developing a new or improving an existing course taught in schools [24]. According to curriculum expert [25], curriculum development is about "discovering and articulating, for oneself and with others, the educational significance of the school subjects for self and society in the ever-changing historical moment" (p. 16). The central focus of curriculum development is to

make teaching and learning more meaningful to students through improvements and innovations in education to effectively address contemporary societal issues.

[26] noted four types of curriculum development approaches: instrumental approach, communicative approach, artistic approach, and pragmatic approach. The instrumental approach to curriculum development is based on clear and measurable predetermined objectives, which provide the basis for the curriculum design. The communicative approach takes into consideration the perspectives of all stakeholders and interested parties in the design of the curriculum. The chosen design is the one agreed on by the majority of the parties involved. The artistic approach does not follow laid down procedures or criteria. Rather, it is dependent on the designer's creativity, intuition, and expertise. The final type, the pragmatic approach, is concerned with the practical usefulness of the curriculum to the end users.

Although there are various processes to curriculum development, the study discusses five general processes highlighted by [27]: design, development, implementation, analysis, and evaluation. The design stage generally involves a context analysis of the existing curriculum and deciding how it can be changed or altered. It includes "a problem analysis, a context analysis, a needs analysis, and an analysis of the knowledge base" (p. 15). The development stage involves drawing up, testing, and refining the requirements for the change. This is followed by implementation, where the change is executed. In all phases, evaluation is needed to make the product more attuned to the practice setting. It is important to emphasise that curriculum development is not an end in itself, but a continuous process involving interconnected processes. A review of the policies of the regulator of tertiary education in Ghana (GTEC) indicates the absence of a comprehensive protocol to be followed by tertiary institutions in the development of curricula. This could partly be attributed to the semi-autonomous status of Ghanaian higher educational institutions supported by their establishing Acts.

2.3. Quality Assurance

Quality assurance, as a concept in higher education, is an imported term from the business and industrial sectors generally denoting "planned and systematic activities implemented within the quality system that can be demonstrated to provide confidence that a product or service will fulfil requirements for quality" [28, p.2]. Put differently, quality assurance in the business setting is the set of activities aimed at ensuring that a product or service maintains its desired level of quality at every stage of the production process [29].

In the educational context, however, quality assurance takes on a slightly different meaning because education involves several processes and actors (such as administrators, students, instructors, and other stakeholders) that work together in a complex environment. Unlike goods, as in the case of the business industry, education is concerned with transforming students' mindsets, values, and attitudes. Moreover, the definition of quality assurance in the educational setting can be subjective, as it is often perceived differently by various actors, such as governments, students, administrators, and lecturers [30, 31]. This implies that any definition of quality assurance in the context of higher education must consider the views of these actors. Generally, quality assurance in higher education management reflects the systems put in place to ensure that activities carried out in higher institutions meet predetermined standards and are of high quality [32]. Again, quality assurance refers to the reforms and practices established to improve school arrangements and education practices to ensure that they effectively support the achievement of educational goals and objectives [7].

[33] highlights two types of academic quality assurance: internal and external quality assurance. Internal quality assurance denotes "those policies and practices whereby academic institutions themselves monitor and improve the quality of their education provision" (p.1). In contrast, external quality assurance denotes "supra-institutional

policies and practices whereby the quality of higher education institutions and programmes are assured" (p.1). These include national policy frameworks designed and monitored to assure the quality of education. Both approaches complement each other in ensuring effective quality assurance in higher education institutions. In this study, however, we focus more on internal quality assurance - that is, those policies and programmes designed by individual universities to maintain and improve quality education.

2.4. Quality Assurance and Curriculum Development

Generally, the importance of quality assurance in curriculum development stems from the fact that curriculum represents the very essence of education. As noted by [22], curricula are the *raison d'être* of education. It carries "the beliefs, values, attitudes, skills, knowledge and all that education is about" [6, p. 21]. [34] similarly noted that curriculum is the outcome of in-depth reflections by political and social actors on the desired society of the future. This implies that curriculum is a crucial element in education (especially in higher education), where the quality of education is, to a large extent, dependent on the quality of the education programme curriculum [23, 35].

How can quality be ensured in curriculum development? [6] discussed how higher education institutions in Africa can improve quality assurance in curriculum development by using *21st-century competencies* and *Sustainable Development Goals* (SDGs). In explaining the former, [6] argued that the 21st century has seen rapid development and infusion of technologies in all aspects of life, and for Africans to fully maximize the benefits of technology, then education curricula must be shaped to give students the needed competencies in this regard. Concerning the latter, [6] averred that higher education institutions have a fundamental role in spurring the continent's drive to attain the SDGs by ensuring that students attain knowledge and skills in areas like global citizenship, innovation and scientific thought, and sustainable development among others. Indeed, higher education institutions have long been recognised by the developers of the SDGs as one of the key institutions that can help in the achievement of the goals: "They have the mission to promote development through both research and teaching, disseminating new knowledge and insight to their students and building their capabilities" [36].

Other scholars have also emphasised the importance of stakeholder involvement in creating quality curricula e.g., [37, 38, 35]. These stakeholders have been categorised into external and internal stakeholders. External stakeholders consist of accreditation agencies, governments, and labour markets among others. Internal stakeholders consist of students, lecturers, and administrators. Both categories of stakeholders play a very important role in ensuring that curricula meet higher standards. For instance, since students are the recipients of education, involving them in curriculum development can provide insights into the teaching objectives, the best teaching methods as well and the topics that are relevant to their human capital development [39, 40, 41]. Moreover, if students feel connected to the course objectives, they are likely to approach learning with a more positive outlook [42]. Likewise, academics are the frontline workers in the education setting, therefore, their input and expertise are needed to make curricula more impactful and of high quality [43, 44, 45]. On the external part, engaging employers (the labour market) in course design and delivery can further aid the employability of students since they will possess the competencies needed for the labour market [46].

Although various stakeholders may hold diverse views about what quality curriculum means, given their values and interests, involving them in a timely and authentic manner is necessary to ensure quality [47]. [48] also noted that quality may be assessed by the extent to which educational programmes meet the visions, missions, and objectives of educational institutions. Cases have also been made for the inclusion of experts/peer reviewers in curriculum development [49, 50]. Peer reviewers are often

experts in the course that is being developed or general curriculum specialists who can assist in supervising or reviewing curriculum development.

2.5. Quality Assurance in Curriculum Development in Ghana

In Ghana, the major institution that oversees curriculum development activities of institutions of higher education is GTEC with the objective of ensuring that tertiary institutions in the country apply the highest quality standards in all education-related activities, including curriculum designs. Apart from GTEC's supervisory activities, almost all tertiary institutions in Ghana have internal quality assurance policies that guide academic activities like curriculum design, research performance, teaching and learning processes as well as student-lecturer assessments.

Tertiary institutions in the country have different names for the units responsible for such activities, such as the Academic Quality Assurance Unit, Planning and Quality Assurance Unit, or simply Quality Assurance Unit. Among other things, such units ensure that stakeholders are well informed about all approved quality standards of their institutions, and they also play supervisory roles to ensure that they are strictly adhered to. Approved curricula by internal quality assurance units are then sent to the national body (GTEC) for final approval.

3. Methodology

In this study, we focus on UMaT. UMaT is a publicly funded university located in the Western Region of Ghana. The university is situated in Tarkwa, which is the centre of mining activities in the country. Given its special location, the university has been tasked with providing higher education in the fields of mining, technology, and related disciplines. In addition, it has a satellite campus at Essikado. Currently, the university has five (5) faculties: Engineering, Mining and Minerals Technology, Geosciences and Environmental Studies, Computing and Mathematical Sciences and Integrated Management Science. It also has three (3) schools: Postgraduate Studies, Petroleum Studies and Railways and Infrastructure Development. The university's guiding philosophy is to develop students' intellectual capabilities, thereby producing graduates capable of providing useful professional services. The university offers postgraduate, undergraduate, diploma and certificate programmes (as at June 2023). UMaT currently has over 7700 students with about 600 staff (both teaching and non-teaching).

To better explain how UMaT integrates quality assurance in its curriculum development activities, we adopted the qualitative research approach to provide an in-depth description and understanding of the phenomenon. We collected data from two sources: primary and secondary data. Primary data was collected through in-depth face-to-face interviews with fourteen (14) officials selected from four (4) levels responsible for curriculum development in UMaT: Departmental Board, Faculty Board, Academic Board, and Planning and Quality Assurance Unit (PQAU). We interviewed at least two key informants from each level. The interviews were guided by semi-structured questions developed from the research questions underpinning the study. Specifically, the interviewees were asked to discuss their perspectives on the procedure for curriculum development in the institution, how quality assurance is ensured in the curriculum development process, and the challenges in ensuring quality assurance in curriculum development. We purposely interviewed participants with expert knowledge of curriculum development and its related activities in UMaT. The participants were also considered on the basis that they have actively participated in curriculum development activities at the university for at least five years. The reason for these criteria is to permit valid and reliable responses from participants with relevant information on the subject.

To ensure internal validity, the researchers, in the course of the interview, often repeated the interviewees' responses back to them to verify their answers. Reliability was ensured through data triangulation. It is for this reason that we included at least two

respondents from each level responsible for curriculum development in the institution. The interviews were conducted between September 2022 to June 2023 and lasted 21 minutes on average, ranging from 10 minutes to 35 minutes. All the interviews were manually transcribed because the responses were quite straightforward and manageable. The transcriptions were thoroughly reviewed by each author, and common themes were identified and agreed upon by all three authors based on the research questions.

The study complied with all the ethical codes and conventions of UMaT, such as ensuring informed consent, voluntary participation, and confidentiality. Before the interview sessions, the researchers briefed the respondents on the purpose of the study and assured them of absolute confidentiality and voluntary withdrawal. The interviews were conducted only after the respondents' verbal consent. Secondary data was obtained from sources like textbooks, published journals, institutional reports, and curriculum development documents of UMaT as well as policy documents of GTEC. Information collected through the secondary data was also described in a manner relevant to answering the research questions. While we acknowledge that other research designs like observations, surveys, and focus groups could produce different outcomes, the procedure we adopted is quite transparent and can be replicated. [Table 1](#) provides a summary of the respondents' demographic information.

Table 1. Summary of Respondents' Demographic Information

Board	Current Position	Current Rank	No. of years with UMaT	Educational level
Academic Board Rep.	HoD	Senior Lecturer	15	PhD
Academic Board Rep.	HoD	Senior Lecturer	13	PhD
Academic Board Rep.	Dean	Assoc. Professor	19	PhD
Faculty Board Rep.	Dean	Professor	27	PhD
Faculty Board Rep.	Dean	Assoc. Professor	23	PhD
Faculty Board Rep.	HoD	Senior Lecturer	14	PhD
Department Board Rep.	Exams Officer	Lecturer	8	PhD
Department Board Rep.	Lecturer	Lecturer	7	PhD
Department Board Rep.	Lecturer	Assistant Lecturer	8	MBA
Department Board Rep.	Lecturer	Senior Lecturer	10	PhD
Department Board Rep.	HOD	Senior Lecturer	13	PhD
Department Board Rep.	HOD	Senior Lecturer	10	PhD
Quality Assurance	Administrator	Assistant Registrar	11	MBA
Quality Assurance	Vice Dean	Assoc. Professor	13	PhD

4. Results

4.1. *The Procedure for Curriculum Development in UMaT*

In UMaT, curriculum development passes through four (4) levels: the Departmental Board, Faculty Board, Academic Board, and Planning and Quality Assurance Unit (PQAU). Each level plays an important role in both the development and final output of a newly developed or updated curriculum. The process is often initiated by the Departmental Board. In this role, the Departmental Board is expected to consult those who will be affected by the proposed change, use multiple data to solicit feedback from students and other stakeholders about the curriculum, and ensure that the document is formatted according to the institution and national regulation checklists. The document is then forwarded to the Faculty Board, which either endorses, rejects, or returns the document (for further review) based on certain checklists. The Academic Board serves as the final authority to review the proposed or reviewed curriculum. Its primary role is to examine the implications of all proposed curricula and approve or reject them. It then submits the approved curriculum to GTEC, for final approval.

The supervisory and coordination of all these processes at the institutional level are performed by the PQAU, whose role is to ensure strict compliance with quality standards at all levels of the review process. PQAU is required to organise training workshops for all curriculum committees occasionally and also support the departments to seek peer and professional assessment of the curriculum.

4.2. *How Quality Assurance is Ensured in Curriculum Development at UMaT*

Our findings reveal that all four levels responsible for curriculum development in the university have common criteria by which they determine the quality of any proposed or revised curriculum. We identified three themes: (1) Ensuring that the curriculum addresses current and future developmental needs, (2) making sure that the curriculum reflects national and university regulations, and (3) the involvement of key stakeholders. Below, we expound on these themes. Further, we highlight two mechanisms employed by UMaT to ensure that the quality standards are observed: staff training and rejection of curricula that do not meet standards.

4.3. *Ensuring that the Curricula Address Current and Future Developmental Needs*

Designing curricula to meet the current and future developmental needs of the country is of priority to the management of UMaT. Maintaining the quality standard helps students to practically think about current and future opportunities and challenges in their various fields, and how to apply scientific knowledge and inquiry to address them. Generally, this is achieved by constant monitoring of the job market to identify issues of relevance to the national and world economy, including real case studies in the syllabus, emphasizing the application of new technologies, consulting practitioners/experts, and reviewing special issues in academic journals to identify prevailing subjects/topics. For instance, one of the respondents who has been at the forefront in the development of new programmes like BSc in Aerospace Engineering, PhD in Mechanical Engineering, and Diploma in Plant and Maintenance Engineering, said:

It has always been our goal to ensure that the programmes meet the current developmental needs of Ghana and the world at large. So, we constantly monitor the job market, lookout for new technological inventions, and their broad implications for industries. And this is not a one-time activity. We often update our curriculum to be current (Interview with a participant at the Departmental level).

While the major rationale for this quality standard, according to the respondents, is to ensure that curricula align with global needs, it is also a calculated attempt to ensure

that the graduates produced by the university can successfully compete globally and are fit for the job market. One of the respondents, for instance, noted:

The motivation is not only to ensure that the curriculum meets national developmental needs but to also ensure that we produce graduates that meet world-class standards in their respective fields (Interview with a participant at the Academic Board level)

4.4. Making Sure that Curricula Reflect National and University Regulations

Although UMaT exercises significant autonomy in developing academic curricula, management ensures that final curricula reflect quality standards required by national regulations and those required by the university. In terms of national, UMaT follows the curriculum development template of GTEC. The Commission, among others, requires institutions to demonstrate the relevance of the proposed programme to national development (linking it to the national development objectives), justify the relevance of the programme and its uniqueness from existing ones, demonstrate how the programme will help resolve skill inadequacy in a particular sector, and also the programme's alignment with the mission and strategic plan of the institution. Again, the Commission mandates that institutions describe the competencies that will be acquired after the programme, indicate the levels of consultations for the design of the programmes (consultation with the appropriate supervisory body), and show collaboration with identified professional bodies that will license graduates after the programme.

Further, GTEC requires that institutions specify the market and employability for the programme, the minimum qualifications for admission into the programme as well as the retention and graduation requirements, the sources of funding for the programme, and the availability of physical facilities to properly run the programme, in addition to qualified faculties to teach on the programme. All these requirements are to guarantee the provision of quality curricula in the country. In terms of university regulations, UMaT requires that all proposed and revised curricula meet some internal quality standards which are similar to those of GTEC. Some of the requirements include consultation with those who will be affected by the proposed change, using multiple data to solicit feedback from students and other relevant stakeholders about curricula, and ensuring that the final document is formatted under institutional and national standards. Another internal factor used to assess the quality of curricula is the mission and vision of UMaT. Given that both the vision and mission of the university prioritise academic excellence and the production of world-class students particularly in mining and technology, all curricula are expected to reflect these objectives. To put it simply, the quality of a curriculum is based on its ability to help students develop their intellectual capabilities in their respective fields.

4.5. Involvement of Key Stakeholders

Another strategy employed by UMaT to ensure that curricula are of quality is the consultation of three key stakeholders: students, professional bodies, and experts. It is worth noting, however, that only a few of the respondents confirmed that these stakeholders are indeed consulted while the majority thought this was not effectively done. Those who confirmed the involvement of students noted that they usually allow about two students from the classes that would be affected by the curriculum to observe and share their opinions on the proposed curriculum when the GTEC Team visits. According to the respondents, such platforms allow student representatives to provide constructive feedback on the curricula before they are rolled out. Respondents who offered contrary views argued that to the best of their knowledge, students were seldom involved at the initial stages of the curriculum development. Students, they argued, only

get to have a say on a proposed curriculum during the usual end-of-semester course evaluation of lecturers and course contents.

Concerning the involvement of professional bodies, some respondents from the Faculty, Academic Board, and Planning and Quality Assurance Unit confirmed that it is one of the things they look out for when rating the quality of curricula at the Departmental level. The major rationale for involving professional bodies, according to the respondents, is to align the curriculum with industry demands and to provide the students with work-integrated skills. The respondents, nevertheless, expressed some difficulties with accessing the services of professional bodies, some of which include costly consultation fees and delayed or no response. For this reason, some departments consult past students (alumni) belonging to the professional bodies of interest. Respondents who offered contrary views regarding the involvement of professional bodies noted that although the inclusion of comments from industry players is a key requirement in the curriculum development process, its application has been low given the difficulties in accessing the services of those players.

Regarding the inclusion of experts, defined as the involvement of both internal and external individuals with in-depth knowledge and expertise in the programme or consultation with universities that run similar programmes, the majority of the respondents showed that the university relies more on internal expertise than external. Further, none of the respondents spoke about consultation with other universities running similar programmes. This is not surprising as UMaT is the only university in Ghana accredited to run some particular programmes, especially in the fields of mining, minerals and related disciplines.

4.6. Mechanisms Employed by UMaT to Ensure that the Quality Standards are Observed

To ensure that the three quality standards (discussed above) are enforced at all the relevant levels, the university employs two mechanisms: staff training and the rejection of curricula that do not meet required standards. Staff training involves regular workshops for personnel in charge of curriculum development at the Department, Faculty, and Academic Board levels. These workshops are typically organised by the university's PQAU at least once a year or in the event of new updates on national or university regulations. The purposes of the workshops are to help personnel understand national and university curriculum development regulations and format, make them aware of the major concepts they must consider when designing curricula, and provide them with techniques for developing lesson plans and student evaluation instruments as well as assessing student learning outcomes.

Concerning the second mechanism, since the curriculum development process in the university is hierarchical, where activities carried out at one level must be approved at a much higher level, especially the Faculty Board, Academic Board, and PQAU, exercise the right to either reject or accept (sometimes with minor/major revisions) proposed curricula. Some respondents cited several instances of how they rejected curricula at other levels on several grounds such as non-compliance with UMaT and GTEC formats, the inability of the curriculum to respond to the changing needs of society, inability to provide inputs from stakeholders, like experts and industrial practitioners, and insufficient reference/reading materials. Together, these two mechanisms help ensure that quality standards underlying curriculum development in the university are, to a large extent, followed. While the first strategy provides personnel with a clear philosophy of the overarching goals guiding curriculum development in the university, the second strategy engenders a sense of professionalism—that is, making them aware of the repercussions of poorly designed curricula.

4.7. Challenges in Ensuring Quality Assurance in Curriculum Development

Despite the immense efforts put in place by the university to ensure that the programmes developed are of quality, there are still some challenges that hamper the effectiveness of these efforts. Five themes emerged from the interviews: limited time to create curriculum, less consultation with other stakeholders, lack of experts to support curriculum development, delay in the accreditation process, and absence of curriculum development frameworks for specific programmes. In what follows, we elaborate on these themes.

4.7.1. Limited Time to Create Curriculum

The first challenge revolves around the need to produce curricula within a limited time. According to the respondents, such a rush often affects (negatively) the quality of curricula as less time is given to producing comprehensive and well-planned programmes. Limited time affects quality standards like consulting other stakeholders (e.g., practitioners and experts from other universities), conducting a thorough literature search to identify practical gaps that would be filled by the proposed curriculum, and meeting other quality standards required by GTEC and the institution itself. This was well elaborated on by a respondent from the Faculty:

Sometimes, we are made to work under pressure to produce academic programme documents. In that case, there's little time to systematically examine the document and ensure that all protocols were followed. What even makes the situation worse is the fact that some documents take a long time to be further discussed at the next level. Why then do they give us undue pressure to finish fast? It compromises quality (Interview with a participant at the Faculty level).

4.7.2. Less Consultation with Other Stakeholders

Some respondents also cited “non-consultation with other stakeholders” as a major challenge to ensuring quality in the curriculum development procedures of UMaT. Although some departments engaged other stakeholders like practitioners and experts from other universities (as discussed in Section 4.5), we found that this was not the case for all departments. Two major reasons were cited by the respondents as possible causes for this challenge: delayed or no response from stakeholders and limited time to prepare the curriculum. This means that some departments did reach out to practitioners to get their input on the proposed curriculum. But as it turned out, most of the calls were either not returned at all or came at a later date. Also, letters written to some of them were not responded to, while responses from others came at a later date. Relatedly, since some departments had limited time to prepare their curricula, there was little space to consult other stakeholders. The respondents were fully aware of the possible repercussions of this challenge. One of them, for instance, said:

Most often, curriculum development is not subjected to further or thorough review by industry players. It affects the quality of the curriculum since it does not ensure that the needs/requirements of the industry are addressed. How then can we train our students to become relevant to the industry? (Interview with a participant at the Departmental level).

4.7.3. Lack of Experts to Support Curriculum Development

Some of the respondents also noted that some departments do not have academic professionals with adequate expertise in curriculum development. The absence of such professionals, according to the respondents, makes it difficult for some departments to develop curricula that meet acceptable standards. One of the respondents noted

If there were experts, they would analyse the content and instructional approaches of every curriculum and ensure they are effective and meet acceptable standards before we submit them to GTEC or start using them (Interview with a participant at the Departmental level).

4.7.4. Delay in the Accreditation Process (feedback from the regulator often delays)

The respondents further revealed that the accreditation process in the university often takes a long time to complete for both new programmes and re-accreditation, and such delay is often from the regulator - GTEC. They noted that some accreditation procedures could take as much as three to four years to complete, which distorts academic planning. One of the respondents, for instance, lamented:

We often paid the necessary fees and responded to GTEC Panel Assessment Queries within the stipulated time, but GTEC often delayed processing the application. These are the reasons why some Public Universities admit students into unaccredited programmes with the hope that the programme will be accredited before the students complete their studies [i.e., within four years]. I believe this challenge can be addressed if GTEC decentralises its operations by having offices in other regions (Interview with a participant at the Planning and Quality Assurance Unit).

4.7.5. Absence of Curriculum Development Frameworks for Specific Programmes

The respondents also pointed out the absence of curriculum development frameworks tailored to specific programmes. Consequently, most programmes follow a generic framework, which often affects the quality of the end product. A tailored framework can help improve the learning experiences of students and ensure that graduates are able to fit into the global village.

5. Discussion

The above findings show that UMaT has a well organised procedure to guide the development of high-quality curricula. Influenced by both national and institutional quality assurance frameworks, curriculum developers in the university combine diverse quality checklists, such as consulting various stakeholders (like practitioners and experts), reviewing journals to identify trending topics, and aligning the curriculum with institutional objectives and national needs. Also, given that the university largely majors in STEM programmes, curriculum developers are always on the lookout for new technological innovations. These quality standards are supported by a wide range of literature on quality assurance in curriculum development (e.g., [48, 45, 49, 6]). Together, these quality standards can facilitate the creation of very impactful programmes given their focus on meeting the developmental needs of the nation and the world at large. As rightly argued by Mulenga, a major determinant of the quality of a curriculum is how it accommodates itself “with the fluidity of societal changes” (pg. 22). This, hence, would equip students with the competencies required to be successful in the 21st century.

The findings suggest that for curriculum development to be more effective, there is the need for a well coordinated plan with other stakeholders, a sufficient timeline for curriculum developers, training for curriculum developers, decentralisation of the accreditation process, and the development of specially designed frameworks for each programme. Given the importance of curriculum to the continuing relevance of institutions of higher education, these challenges ought to be addressed with utmost urgency.

6. Conclusion and Recommendations

There is no denying the fact that in the 21st century, quality assurance has become an essential factor for the survival and legitimacy of institutions of higher education. While quality is required in all aspects of institutional activities, a great deal of attention has been paid to quality assurance in curriculum development since curriculum is the very essence of education. In this study, we explored the case of a STEM university in Ghana—UMaT. Specifically, we examined the procedure for curriculum development in the university, how quality assurance is ensured during the process, and the impediments to ensuring quality assurance. Our findings reveal three major standards used to rate the quality of curricula: address current and future developmental needs, reflect national and university regulations, and input from key stakeholders. We also discussed five challenges that hamper quality assurance in curriculum development: limited time to create curriculum, less consultation with other relevant stakeholders, lack of experts to support curriculum development, delay in the accreditation process, and absence of curriculum development frameworks for specific programmes. Ultimately, our findings suggest that although UMaT has instituted some mechanisms to instill quality in its curriculum development activities, much work needs to be done to further enhance the quality of the process. While a major step would be correcting the five challenges raised, it is also imperative that practitioners willingly engage with the university (and all higher education institutions in the country) when it comes to curriculum development since school curricula largely influence industry staffing needs. To some extent, this study highlights crucial mechanisms that can be employed by institutions of higher education to enhance the quality of their curriculum development activities - not only in Ghana but across the world.

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