In search of quality: students' perceptions of designed online courses

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Abstract

Emphasizing, obtaining, and utilizing a standardized guide for online instruction can never be overemphasized. The study sought to explore the degree to which an adapted and modified Quality Matters Review Standards; students' engagement, student support, and student learning reflected on students' perception of designed online courses. Convenience sampling was employed to access 542 participants through a link situated in Google Forms via the student listserv. Data was analyzed using descriptive statistics and multiple regression analysis. Participants reported high positive perceptions on all the independent latent variables: students' learning, engagement, and support based on QM-rubric-designed online courses. The study revealed that all three variables contributed to predicting students' evaluation of the designed online course. Higher education institutions especially the one under study should develop coherent strategies to integrate the QM-rubric as a pedagogical standard for best practice in delivering online learning.

Keywords: Online courses; pedagogy; quality matters rubric; students' engagement; student learning; students support

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1.   Introduction

The appropriate use of ICTs for teaching and learning has always been a challenge (Unal & Ozturk, 2012; Zakaria & Khalid, 2016) as a result of the lack of infrastructure and human resources (Johnson et al., 2016) especially in developing countries (Antwi, et al., 2018; Onwuagboke et al., 2014; Ssekakubo et al., 2011). However, recent developments indicate that more higher education institutions have taken the initiative to complement traditional face-to-face instruction with online instruction (Mtebe & Kondoro, 2016; Naidoo, 2017). Thus, placing more emphasis on how these ICTs are operationalized into teaching and learning (Ghavifekr, et al., 2012; Ghavifekr & Mohammed, 2015; DeCoito & Estaiteyeh 2022). One such innovation in this case is the University of Cape Coast (UCC), a prominent University in Ghana's initiative to introduce a blended mode for teaching and learning. To achieve its ICT policy goals for effective and efficient instruction, learning, and research (Edumadze & Owusu, 2013), the University recently introduced and placed emphasis on the usage of a Learning Management System (LMS) for teaching and learning. The use of LMS at that point was in its infancy stage with some departments using diverse LMSs without the University having direct control (Bansah & Agyei, 2022). These fragmented initiatives were due to the personal interest of various department faculty or faculty prior knowledge of using an LMS elsewhere (Bansah & Agyei, 2022). This necessitated the University to adopt the Moodle learning platform for unified University-wide usage (Bansah & Agyei, 2022).

UCC was at its infancy stage of encouraging faculty to embrace the usage of the LMS for instruction with some basic training for members of faculty when the COVID-19 pandemic struck. Despite the COVID-19 pandemic, a series of training on the usage of the LMS were organized for members of the faculty of the University. While this effort was commendable, there was no emphasis on quality assurance issues such as the application of Quality Matters (QM) when developing or designing an online course. Faculty were only trained on how to use a few features of Moodle e.g., how to upload learning materials, conduct assignments, grade and archiving learning materials. Emphasizing the importance of QM for the facilitation of an effective and efficient utilization of an LMS cannot be overstated (Lowenthal & Hodges, 2015). QM focuses on three main concepts; course beginnings, course alignment, and course technology which are supported by a set of guidelines for flexible adaptation for diverse course levels and needs (MacGregor-Mendoza, 2017) that are easily accessible and tied to learning outcomes (Chand & Gabryszewska, 2021).

As one of the current trends in educational delivery, the popularity of online education, obviously made so by the COVID-19 pandemic cannot be overstated. For instance, student registration for Coursera's online courses saw a three-fold increase in new registration in 2021 with a 32% student enrolment estimated at 189 million (Wood, 2022). While there was less online presence in Africa, Africa recorded the highest growth in both student registrations and course enrolments (Wood, 2022). These outcomes reiterate the growing worldwide acceptance of online teaching and learning and, the growing competitive pressure on global universities to incorporate technological innovations into online education. Access to quality online learning is important for helping learners to future-proof their skills through well-designed online platforms or courses (Chand & Gabryszewska, 2021). The full potential of online education is yet to be attained. For instance, Protopsaltis and Baum (2019) reported consistent underperformance by students from low-income, under-represented backgrounds and with weak academic preparation in fully online environments.

Furthermore, employers, students, faculty, academic leaders, and the public are reported to value classroom degrees over online degrees due to their lower success rates (Protopsaltis & Baum, 2019). The integration of online education continues to transform traditional classroom course delivery methods (Turnbull et al., 2020). Reiterating the need for institutions to invest in online education best practices that can consistently emphasize the critical role of constant and productive interaction between students and instructors (Protopsaltis & Baum, 2019), by employing guidelines that can align course and technology (MacGregor-Mendoza, 2017) based on desired learning outcomes (Chand & Gabryszewska, 2021). Therefore, this study sought to explore the degree to which

slightly adapted QM-Review standards; student engagement, student support, and student learning reflected on students' perception of designed online courses.

1.1. Theoretical framework

1.1.1. The QM rubric standards

Online education remains a vital component of human life, especially during the COVID-19 pandemic. As such, promoting a standardized guide for online education is paramount. One such standard used for the designing of online courses is the Quality Matters (QM). Maryland Online Inc. has been at the forefront of the development of the QM rubric (Robinson, 2017) which is made up of a set of eight standards and 42 specific reviews. The QM rubric is used to appraise developed online courses (Delva et al., 2019; MarylandOnline, 2021) based on a scoring system that is employed to ascertain whether a developed course meets the standard or not.

Of the 42 specific review standards, 23 are regarded as essential and are awarded 3 points. The remaining are either rated as very important or important with scores of 2 or 1 respectively (The Center for Teaching and Learning, 2021). For QM certification, a developed online course must achieve the essential standards and 85% of the total score (MarylandOnline, 2021). The concept of "alignment" forms the foundation of the QM rubric to elicit better learning outcomes (MarylandOnline, 2021). Based on research and feedback from QM user communities, the QM rubric regularly undertakes a revision process for updates (MarylandOnline, 2021). Table 1 summarizes the operationalized QM rubric with their respective score.

1.1.2. Online course design in QM-certified courses

There have been many different approaches to assess and evaluate quality in online learning (Martin, et al., 2017). Effective and efficient online course design creates an environment for both instructors and learners for independent and self-directed learning (Piña, 2018; Stephen & Rockinson-Szapkiw 2021). The features or tools available on LMS provide a good pedagogical sense, be it from the behaviorist, cognitivist, or, constructivist perspectives (Hodges & Grant, 2015). These pedagogical perspectives can be captured in features of LMS through gradebook, evaluation and monitoring tools, learning materials, multimedia, information, and learner support tools, to mention a few (Walker et al., 2016). Data from interviewed online course designers described using LMS features as a medium to increase social presence (Baldwin, 2019) thus, suggesting its importance for both instructors and learners especially while on the go (Khan, et al., 2017). These features also aid learners with course information or direction to important course components (Ralston-Berg et al., 2015). The main aspect for consideration in designing an online course is to ensure that each related component within the LMS supports the achievement of a maximum learning experience (Surjono, 2011). For instance, components such as the quality of the technology and online learning tools are known to predict student satisfaction (Alizadeh et al., 2019; Kintu et al., 2017; Barber, 2020) and attainment of better learning outcomes (Alizadeh et al., 2019; Bayrak, 2022; Ren et al., 2023). The Sixth Edition of the QM rubric (2020) is summarized in Table 1.

Table 1

Summary of the QM rubric Sixth Edition (2020).

Standard No.	Standard*	Operational definition*	Points
1	Course Overview and Introduction	The overall design of the course is made clear to the learner at the beginning of the course.	16
2	Learning Objectives (Competencies)	Learning objectives or competencies describe what learners will be able to do upon completion of the course.	15
3	Assessment and Measurement	Assessments are integral to the learning process and are designed to evaluate learner progress in achieving the stated learning objectives or mastering the competencies.	13
4	Instructional Materials	Instructional materials enable learners to achieve stated learning objectives or competencies.	12

5	Learning Activities and Learner Interaction	Course activities facilitate and support learner interaction and engagement.	11
6	Course Technology	Course technologies support learners' achievement of course objectives or competencies.	08
7	Learner Support	The course facilitates learner access to institutional support services essential to learner success.	10
8	Accessibility and Usability	The course design reflects a commitment to accessibility and usability for all learners.	**15**

Source: Adopted from The Quality Matters Rubric. (n.d.).

1.1.3. Student learning in QM-certified courses

Online learning continues to be adopted by most higher education institutions to facilitate teaching and learning as a complementary method to the traditional face-to-face approach (Araka et al., 2021). Online and hybrid/blended learning can be characterized by learning engagement in synchronous or asynchronous environments using diverse devices (Shivangi, 2020; Müller et al., 2023) and, blending of face-to-face and online learning (Potter, 2015) respectively. QM provides guidelines on what may constitute quality in online teaching (Martin et al., 2016). For instance, student learning and engagement have been reported to be impacted by course activities and learner interaction in a QM-designed course (Sadaf et al., 2019). As such, online instructors have been encouraged to use these two standards of QM guidelines to encourage students to become active learners (Sadaf et al., 2019). Courses designed by following QM guidelines have been reported to improve students' grades as well as interaction with course materials (Hollowell, et al., 2017). Furthermore, motivation with positive attitudes to gain knowledge has been reported in learners who enrolled in QM-designed hybrid/blended courses (Young, 2014).

1.1.4. Student engagement in QM-certified courses

At the center of student engagement is learner to learner, instructor to learner and, learner to course content interactions (Dixon, 2015). Martin and Bolliger (2018) emphasized the importance of student engagement in learning and learner satisfaction. This is further reiterated by Muir et al., (2019) who linked online course student engagement to better learning outcomes, student retention, and completion times. Research suggests an alignment between the QM rubric and the majority of the principles for good teaching (Crews & Wilkinson, 2015). Such factors could include course activities and learner interaction and course technology applications of the QM (Martin, et al., 2016; Sadaf, et al., 2019). The benefits of QM cannot be overstated (Varonis, 2014) as studies continue to outline the usefulness of student engagement in online learning in terms of students' cognitive development for the creation of knowledge for course success (Meyer, 2014) and improvement of learners' GPA (Knapp & Paull, 2013). Hixon et al., (2015) are of the view that it is paramount for instructors to take advantage of QM to promote learner engagement.

1.1.5. Student support in QM-certified courses

The availability of technical support is vital in eliciting student satisfaction in an online education delivery (Young & Norgard, 2006). Other support could be captured as informing learners of services that are available in supporting the realization of course expectations, thereby promoting easy navigation of courses developed by an institution (Legon, 2015). QM advocates for the provision of multiple ways for students to access course information to promote students' understanding of the curriculum (Robinson & Wizer, 2016). A study that examined students' perception of the impact of QM-certified courses reveals that learner support is vital to students' learning and engagement (Sadaf, et al., 2019). An assertion further reiterated by Elaasri and Bouziane (2019) and, Varonis (2014).

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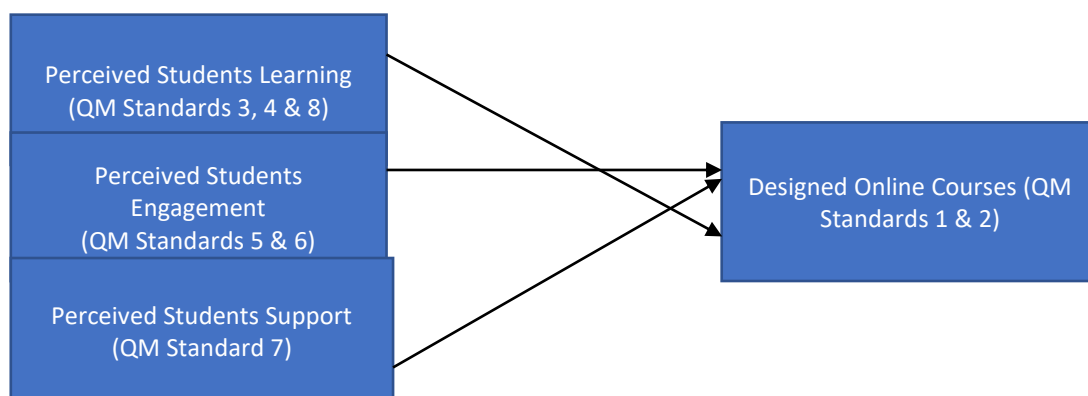
1.2. Conceptual framework

The global disruption of education as a result of the COVID-19 pandemic cannot be overstated (UNESCO, 2020). As a result, educational institutions had to determine innovative ways of providing instructions and learning due to the full and temporary closure of schools. A complete application of educational technologies for these purposes became the ultimate alternative to face-to-face instruction and learning (Ayu & Pratiwi, 2021). Educational institutions that once did not consider online education had to commit to it to maintain their academic calendars. Teaching and learning using online delivery meant both instructors and learners had to adjust to methods for lesson delivery and learning respectively.

Despite some outlined challenges associated with online education (Pandit & Agrawal, 2021), its advantages have also been reiterated (Afrouz & Crisp, 2021). Adjusting or effectively delivering online education requires skills that are obtained through training. To reiterate this assertion, Branch and Dousay (2015) are of the view that effective online delivery and learning encompass a well-thought-of instructional design and planning and these are paramount for quality assurance for an online course design. This could be taken for granted if an institution does not have the services of instructional technologists/designers or an online course assessment office. As such, the processes involved in designing effective online courses cannot be ignored, especially in a challenging time like post CoVID-19 pandemic (Hodges, et al., 2020).

For first-timers, designing an effective online can pose a unique challenge especially related to content development, engaging students, adapting to new teaching methodologies, and time management (Kebritchi, et al., 2017). While some studies have reported on challenges related to infrastructure and online delivery (Figueroa, et al., 2020) and cost (Demuyakor, 2020), the current study delves into only the instructional design processes involved in online course delivery. It is reported that about a thousand U.S. colleges and universities have adopted the Quality Matters (QM) rubric which has been reported to encompass the best practices suited for online education (Legon, 2015). However, not all educational institutions are aware of the QM-Rubric and its importance to online education design. The relationship between designed online courses (DOC), perceived student learning (PSL), perceived student engagement (PSE), and perceived student support (PSS) is presented in Figure 1.

Figure 1
Study Construct

From Figure 1, the study slightly adapted the QM-Rubric by comprising the 8 QM-Rubric standards into four composite variables designed online course (DOC), perceived student learning (PSL), perceived student engagement (PSE), and perceived student support (PSS). Thus, the study hypothesized DOC (dependent variable) as a function of students' reported PSL, PSE, and PSS (the independent variables). The paper is of the view that participants' perception of designed online

courses should promote student engagement (Martin & Bolliger, 2018), support (Robinson & Wizer, 2016) and subsequently learning (Sadaf, et al., 2019). Consequently, this study defined designed online courses (standards 1 & 2) as the levels of clarity to enable students to focus on things that matter to facilitate students' accomplishment of course requirements. Thus, it should enable students to connect with the various components of the course including course policies and netiquette to promote their capacity to prepare and respond to issues relevant to the course (Legon, 2015).

PSE in the study referred to or enhanced overall satisfaction through activities used by instructors to engage students to promote active learning. In this case, both the instructor of the course and the student's interactions are aided through a variety of technologies to promote quality interventions in the course (Standards 5 & 6). PSL was also defined as the cognitive domain where students demonstrate varying levels of knowledge, understanding, analysis, and application of the subject matter (standards 3, 4 & 8). This is achieved through an instructor developing a course that is coherent and minimizes students' challenges associated with overloaded course content, activities, and assessments (Legon, 2015). Finally, PSS was defined as student support services in the form of technical and academic, how they can be accessed, and policies that guide these accessibilities (standard 7). Thus, proactively informing students about services available to them to help them meet course expectations and smoothen their academic endeavors while in the institution (Legon, 2015).

1.2.1. The online course design workshop at the Faculty of Social Science at UCC

Most recently, due to the reported CoVID-19 and its related variants globally (Mahase, 2021), the Management of UCC had instructed faculty to provide instruction based on a blended mode, and, students of the University were enrolled in the LMS for the blended mode of learning (30% face-to-face, 70% online). A blended mode instruction with 70% online suggested the majority of the instruction was to be conducted online and as such, raised quality assurance concerns when dealing with online delivery (Lowenthal & Hodges, 2015; Sadaf, et al., 2019). QM design is based on a set of standards developed to encourage best practices in designing online courses to enhance student learning through a peer-reviewed process that certifies the quality of an online course and its components (Sadaf, et al., 2019). To equip faculty with the necessary tools to effectively teach, a training program was organized for the faculty of the Social Sciences at UCC where one of the topics of the training program was "Designing online courses for higher education" which the author facilitated. This topic emphasized the role of QM standards in designing online courses.

QM is a globally used standard for best practices for online education and as such faculty at FSS were encouraged to employ these standards to design their courses. UCC currently does not have an online course certification office nor is it connected in any way to the QM developers. In the absence of an online course certification office to verify the quality of designed online courses through peer review, it was assumed that the faculty of FSS would employ QM-Rubric for their course design since its importance was made known to them. In the absence of a certification office and, students as end product users of the designed courses students are in the best position to provide information related to the design of the courses, they have enrolled in. Assessing students' perceptions of designed online courses would enable the institution under study and similar institutions, especially in Africa are engaged in online courses with no forms of quality assurance outlet to take steps to consider and provide effective and efficient strategies for the implementation of online course certification offices or departments.

1.3. Purpose of study

The paper advocated that since students participated in at least four online courses per semester via an LMS in the previous academic year, their prior experience qualified them to participate in the study. Based on this background, the study sought to explore the degree to which a slightly QM-Review standards; student engagement, support, and learning reflected on students' perception of designed online courses at the University of Cape Coast. Specifically, the study addressed the following research questions: 1) What were the levels of students' perception of

designed online courses? 2) What were the levels of students' perceived engagement, perceived learning, and perceived support of designed online courses? 3) To what extent does the relationship between perceived engagement, perceived learning, and perceived support reflect on students' perception of designed online courses?

2. Methods and Materials
2.1. Participants

Five hundred and forty-two (542) students from the Faculty of Social Sciences (FSS) at the College of Humanities and Legal Studies of the University of Cape Coast were accessed by convenience sampling method. This sampling method was employed because the author is a member of the faculty at the FSS and was also the facilitator in a workshop that emphasized the importance of the QM rubric at the faculty level. Faculty started online instructions during the 2019/2020 academic year during the onset of the COVID-19 pandemic. As a result, students had some experience with online education. The FSS enrolls students on a regular and sandwich basis. Data was obtained from only regular students while the pilot study was conducted among sandwich students for the validation of the instrument (α =0.887). A mean age of 23.9 years was recorded for respondents. All respondents owned some sort of electronic device suggesting a high increase in access to digital technologies and, the majority (n=293, 54.10%) were females. Participants also reported spending an average of 6.6 hours on their electronic devices daily. The rest of the demographic data of the participants are presented in Table 2.

Table 2
Demographic Information of Respondents

Description	N (542)	Percentage (%)
Gender		
Male	249	45.90
Female	293	54.10
Department		
Hospitality and Tourism Mgt.	161	29.71
Geography and Regional Planning	129	23.80
Population and Health	72	13.28
Sociology and Anthropology	180	33.21
Level		
Undergraduate	513	94.65
Masters	17	3.14
Doctoral	12	2.21
Device Ownership		
Smart Phone	410	75.65
Laptop	93	17.16
Tablet	21	3.87
Desktop Computer	6	1.11
Internet Modem	12	2.21

2.2. Data collection instrument

Data from students who were involved in diverse courses at the end of the 2020/21 academic year (semesters 1 and 2) were obtained. A two-part questionnaire was employed for data collection. The first section sought demographic data information while the second part, a slightly adapted QM Higher Education Rubric, Sixth Edition (MarylandOnline, 2021) was used to measure the latent variables of the study. The QM contains 8 standards with each standard comprising of their sub-standards. These sub-standards are 42 items in total. Of the 8 QM standards and depending on the standard's operational definition (Table 1), the paper categorized a standard as the overall Designed

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Online Courses (DOC) variable, a Perceived Students Learning (PSL) variable, or Perceived Students Engagement (PSE) variable or a Perceived Students Support (PSS). Based on the operational definitions, the author categorized items under standards 1 and 2 as "Perceived Designed Online Course", items under standards 3, 4, and 8 as "Perceived Students Learning", items under standards 5 and 6 as "Perceived Students Engagement" and, items under standards 7 as "Perceived Students Support". The internal consistency reliability (from 0.884 to 0.923) of the measured latent variables is summarized in Table 3.

2.3.   Ethics

The instrument as a survey link was administered to the participants of the study at the end of the 2020/21 academic calendar (semesters 1 and 2) through the Departmental Students listserv. The link to the survey was developed and situated in Google Forms. The participants did so voluntarily. The study did not harm any human or the environment.

Participants for this study were human subjects. The author is influenced not only by academic honesty but also by respect for human lives. As such, the author believes in integrity, accountability, excellence in this work, and respect for the participants of this study. The author of this manuscript strongly recognizes the importance and role of institutional review boards to safeguard lives. As such, before data collection, approval was sought from the Institutional Review Board (IRB) of the author's institution.

2.4.   Data analysis

Descriptive statistics and multiple regression analyses were used for data analysis. A mean score of 2.5 and above represented a positive perception and a mean score lesser than 2.5 represented a lower perception. These were based on the 4-point Likert scale. Subsequent sections presented the outcome of the analyses.

3.   Results
3.1.   Respondents reported levels of PSL, PSE, and PSS and designed online courses

All the independent latent variables largely reported fairly high values for PSL (M= 3.12, SD= 0.415), PSE (M= 3.11, SD= 0.450), and PSS (M= 3.07, SD= 0.500) as shown by the overall means. These results therefore suggested positive perceptions of learning, engagement, and support among students towards the designed online courses. The highest mean (PSL= 3.12) reported suggests a relatively large extent to which students deemed designed online courses to be driven by course activities and learner interaction. All recorded item mean scores of this variable except PSL16 exceeded 3.0 (See PSL01–PSL16). *A variable measure of M= 3.11 was also reported for PSE. Of the variable items for PSE, PSE07: A variety of technology was used in the course (M= 2.95) and PSE08: The course provided you with information on protecting their data and privacy (M= 2.91) reported* the lowest mean values (Table 4). The lowest reported independent variable measured (PSS= 3.07) also showed that the respondents received diverse support that might have been incorporated into the designed online courses. However, all the items under this variable exceeded a mean score of 2.5. The highest mean scores (M=3.11) were recorded both to PSS03: Course instructions articulated or linked to the institution's academic support services and resources that can help learners succeed in the course and, PSS04: Course instructions articulated or linked to the institution's student services and resources that can help learners succeed. These were followed by PSS02: Course instructions articulated or linked to the institution's accessibility policies and services (M= 3.05) and PSS01: The course instructions articulated or linked to a clear description of the technical support offered and how to obtain it (M= 2.99).

Table 3

Standard Number, Latent Variables of the Study and Measured Items

Standard No.	Latent Variable	Cronbach's Alpha		Measured Items
1 & 2	*Designed Online Course (OCD)*	.917	[1]DOC01	Instructions by your lecturers made clear how to get started and where to find various course components.
			[1]DOC02	You were introduced to the purpose and structure of the course.
			[1]DOC03	Communication expectations for online discussions/forums, email, and other forms of interaction were clearly stated.
			[1]DOC04	Course and institutional policies with which you were expected to comply were clearly stated within the course, or a link to current policies was provided.
			[1]DOC05	Minimum technology requirements for the course were clearly stated, and information on how to obtain the technologies was provided.
			[1]DOC06	Computer skills and digital information literacy skills expected of you were clearly stated.
			[1]DOC07	Expectations for prerequisite knowledge in the discipline and/or any required competencies were clearly stated.
			[1]DOC08	The self-introduction by the instructor was professional and was available online.
			[1]DOC09	You were asked to introduce yourselves to the class.
			[2]DOC10	The course learning objectives described measurable outcomes.
			[2]DOC11	The module/unit-level learning objectives described outcomes that were measurable and consistent with the course-level objectives.
			[2]DOC12	Learning objectives were stated clearly, were written from the learner's perspective, and were prominently located in the course.
			[2]DOC13	The relationship between learning objectives and learning activities was clearly stated.
			[2]DOC14	The learning objectives were suited to the level of the course.
3, 4 & 8	*Perceived Students Learning (PSL)*	.884	[3]PSL01	The assessments measure the achievement of the stated learning objectives.
			[3]PSL02	The course grading policy was stated clearly at the beginning of the course.
			[3]PSL03	Specific and descriptive criteria were provided for the evaluation of your work, and their connection to the course grading policy was clearly explained.
			[3]PSL04	The assessments used were sequenced, varied, and suited to the level of the course.
			[3]PSL05	The course provided you with multiple opportunities to track your learning progress with timely feedback.
			[4]PSL06	The instructional materials contributed to the achievement of the stated learning objectives.
			[4]PSL07	The relationship between the use of instructional materials in the course and completing learning activities was clearly explained.
			[4]PSL08	The course models the academic integrity expected of you by providing both source references and permissions for the use of instructional materials.
			[4]PSL09	The instructional materials represented up-to-date theory and practice in the discipline.
			[4]PSL10	A variety of instructional materials was used in the course.

			[8]PSL11	Course navigation facilitated ease of use.
			[8]PSL12	The course design facilitated readability.
			[8]PSL13	The course provided accessible text and images in files, documents, LMS pages, and web pages to meet the needs of diverse learners.
			[8]PSL14	The course provided alternative means of access to multimedia content in formats that met the needs of diverse learners.
			[8]PSL15	Course multimedia facilitated ease of use.
			[8]PSL16	Vendor accessibility statements were provided for all technologies required in the course.
5 & 6	*Perceived Student Engagement (PSE)*	.892	[5]PSE01	The learning activities promoted the achievement of the stated learning objectives.
			[5]PSE02	Learning activities provide opportunities for interaction that support active learning.
			[5]PSE03	The lecturer's plan for interacting with learners during the course was clearly stated.
			[5]PSE04	The requirements for learner interaction were clearly stated.
			[6]PSE05	The tools used in the course supported the learning objectives.
			[6]PSE06	Course tools promoted learner engagement and active learning.
			[6]PSE07	A variety of technology was used in the course.
			[6]PSE08	The course provided you with information on protecting their data and privacy.
7	*Perceived Students Support (PSS)*	.923	[7]PSS01	The course instructions articulated or linked to a clear description of the technical support offered and how to obtain it.
			[7]PSS02	Course instructions articulated or linked to the institution's accessibility policies and services.
			[7]PSS03	Course instructions articulated or linked to the institution's academic support services and resources can help learners succeed in the course
			[7]PSS04	Course instructions are articulated or linked to the institution's student services and resources that can help learners succeed.

[1, 2. 3. 4. 5. 6. 7 & 8] Quality matters standard

The dependent variable (DOC), recorded the highest overall mean (Mean= 3.13, SD=0.415) amongst the four latent variables. This is a suggested indication of a high use of QM-rubric for the designed online courses. Consequently, the results suggested that participants had a high perception of effective design and instructional strategies for the online courses. Of all the measured items for the four variables, the dependent variable reported the highest measure item, *DOC02: You were introduced to the purpose and structure of the course (M= 3.35)* as well as the lowest measure item DOC09: *You were asked to introduce yourselves to the class (M= 2.67).* It is worth noting that the majority of mean scores for the items of the four latent variables reported mean scores of 3.0 or more as shown in Table 4.

Table 4
Descriptive Statistics of Latent Variables Measured

Latent Variable		Measured Item	Mean	SD	Overall Mean (SD)
Design Online	[1]DOC01	Instructions by your lecturers made clear how to get started and where to find various course components.	3.25	.596	**3.13(.415)**

Courses (DOC)					
	[1]DOC02	You were introduced to the purpose and structure of the course.	3.35	.627	
	[1]DOC03	Communication expectations for online discussions/forums, email, and other forms of interaction were clearly stated.	3.21	.633	
	[1]DOC04	Course and institutional policies with which you were expected to comply were clearly stated within the course, or a link to current policies was provided.	3.19	.610	
	[1]DOC05	Minimum technology requirements for the course were clearly stated, and information on how to obtain the technologies was provided.	3.01	.674	
	[1]DOC06	Computer skills and digital information literacy skills expected of you were clearly stated.	.298	.658	
	[1]DOC07	Expectations for prerequisite knowledge in the discipline and/or any required competencies were clearly stated.	3.10	.604	
	[1]DOC08	The self-introduction by the instructor was professional and was available online.	3.13	.681	
	[1]DOC09	You were asked to introduce yourselves to the class.	2.67	.838	
	[2]DOC10	The course learning objectives described measurable outcomes.	3.14	.558	
	[2]DOC11	The module/unit-level learning objectives described outcomes that were measurable and consistent with the course-level objectives.	3.16	.554	
	[2]ODOC2	Learning objectives were stated clearly, were written from the learner's perspective, and were prominently located in the course.	3.18	.553	
	[2]DOC13	The relationship between learning objectives and learning activities was clearly stated.	3.19	.554	
	[2]DOC14	The learning objectives were suited to the level of the course.	3.24	.553	
Perceived Students Learning (PSL)	[3]PSL01	The assessments measure the achievement of the stated learning objectives.	3.22	570	**3.12(.415)**
	[3]PSL02	The course grading policy was stated clearly at the beginning of the course.	3.28	.591	
	[3]PSL03	Specific and descriptive criteria were provided for the evaluation of your work, and their connection to the course grading policy was clearly explained.	3.13	.616	
	[3]PSL04	The assessments used were sequenced, varied, and suited to the level of the course.	3.19	.554	
	[3]PSL05	The course provided you with multiple opportunities to track your learning progress with timely feedback.	3.05	.660	
	[4]PSL06	The instructional materials contributed to the achievement of the stated learning objectives.	3.14	.553	
	[4]PSL07	The relationship between the use of instructional materials in the course and completing learning activities was clearly explained.	3.12	.567	
	[4]PSL08	The course models the academic integrity expected of you by providing both source references and permissions for the use of instructional materials.	3.08	.586	
	[4]PSL09	The instructional materials represented up-to-date theory and practice in the discipline.	3.11	.572	
	[4]PSL10	A variety of instructional materials was used in the course.	3.10	.632	
	[8]PSL11	Course navigation facilitated ease of use.	3.09	.546	
	[8]PSL12	The course design facilitated readability.	3.17	.563	

	[8]PSL13	The course provided accessible text and images in files, documents, LMS pages, and web pages to meet the needs of diverse learners.	3.20	.633	
	[8]PSL14	The course provided alternative means of access to multimedia content in formats that met the needs of diverse learners.	3.10	.612	
	[8]PSL15	Course multimedia facilitated ease of use.	3.06	.643	
	[8]PSL16	Vendor accessibility statements were provided for all technologies required in the course.	2.89	.698	
Perceived Student Engagement (PSE)	[5]PSE01	The learning activities promoted the achievement of the stated learning objectives.	3.19	.540	**3.11(.450)**
	[5]PSE02	Learning activities provide opportunities for interaction that support active learning.	3.18	.571	
	[5]PSE03	The lecturer's plan for interacting with learners during the course was clearly stated.	3.18	.629	
	[5]PSE04	The requirements for learner interaction were clearly stated.	3.12	.607	
	[6]PSE05	The tools used in the course supported the learning objectives.	3.17	.608	
	[6]PSE06	Course tools promoted learner engagement and active learning.	3.17	.592	
	[6]PSE07	A variety of technology was used in the course.	2.95	.675	
	[6]PSE08	The course provided you with information on protecting their data and privacy.	2.91	.714	
Perceived Students Support (PSS)	[7]PSS01	The course instructions articulated or linked to a clear description of the technical support offered and how to obtain it.	2.99	.625	**3.07(500)**
	[7]PSS02	Course instructions articulated or linked to the institution's accessibility policies and services.	3.05	.619	
	[7]PSS03	Course instructions articulated or linked to the institution's academic support services and resources can help learners succeed in the course	3.11	.595	
	[7]PSS04	Course instructions are articulated or linked to the institution's student services and resources that can help learners succeed.	3.11	.633	

[1, 2. 3. 4. 5. 6. 7 & 8] Quality matters standard

3.2. *A predictive model for well-designed online courses using PSL, PSE, and PSS latent Variables*

The study hypothesized DOC (dependent variable) as related to students' reported PSL, PSE, and PSS (the independent variables). The study also attempted to investigate the extent to which the relationships between PSL, PSE, and PSS reflected on participants' levels of evaluation of the designed online courses. As a result, a predictive model of the designed online courses, using the latent variables: PSL, PSE, and PSS was conducted. A bivariate correlation was employed among PSL, PSE, PSS, and DOC to promote insight into their connections and the outcome of the model more accurately. Regression analysis was conducted after. Table 5 presents an overview of the results.

Table 5

Bi-variate correlation among latent variables

Latent Variable	OCD	PSL	PSE	PSS
OCD	1.00			
PSL	0.804 (0.000)	1.00		
PSE	0.753	0.849	1.00	

	(0.000)	(0.000)		
PSS	0.656	0.778	0.760	1.00
	(0.000)	(0.000)	(0.000)	

3.3. All correlations were significant at a 0.01 level of significance

The outcome of the study revealed a direct, strong, and significant correlation among the independent latent variables. There was a significant correlation between PSS and PSE (r=0.760, p< 0.001) and PSL (r=0.778, p<0.001) with the strongest recorded between PSE and PSL (r=0.849, p<0.001). This outcome thus suggests that PSS, PSE, and PSL are connected to a higher degree and function closely however the extent of the connection between PSE and PSL was much greater. The results also reported a significant correlation between the dependent variable, DOC and PSL (r =0.804, p < 0.001), PSE (r=0.753, p< 0.001), and, PSS (r=0.656, p< 0.001) at a significance level of 0.01. Evidence from Table 5 reveals a direct linear association between the independent variables and dependent variables. Thus, suggesting that, the strong correlation coefficients of PSS, PSL, and PSE as plausible predictors of an effectively designed online course. Further analyses were conducted to explore how well PSL, PSE, and PSS could predict an effectively designed online course using a regression analysis model. The results are summarized in Table 6.

The F test: F = (3,526) = 343.84 (p <0.001) related to PSL, PSE and PSS were significant. Suggesting that the PSL, PSE, and PSS predicted the DOC when all the items of the latent variables were taken into account in the model. The significant values of the independent variables (PSL= 0.000, PSE= 0.000; PSS=0.011) were all less than 0.05; suggesting that they had a significant effect on designed online courses and as a result can be employed in a predictive model. The analyzed R square of the study confirmed an estimated 77.6% of the variance in the effectively designed online courses was a result of all three independent variables: PSL, PSE, and PSS. This revealed that PSL, PSE, and PSS together accounted for almost 78 percent of the variance perceived in the student's evaluation of the designed online courses. Furthermore, the extent to which each of the three measures was reflected in the evaluation of the designed online courses was determined. The estimated standardized coefficients (PSL= 0.580, PSE= 0.249, PSS=0.216) provided the answers. These coefficients can be described as the degree of increase in students' evaluation of designed online courses when there is a unit gained in each of the three independent variables.

Table 6

Coefficients of Predictor measures (PSL, PSE, PSS) against Level of Online Course Design (OCD)

Model	Co-efficient			F-test	
	Unstandardized	Standardized	Sig.	F	Sig.
(Constant)	.567		.000	343.836	.000
PSL	.579	.580	.000		
PSE	.230	.249	.000		
PSS	.202	.216	.011		

Significant at P < 0.05; Multiple R =0.881; R^2=0.776; Adjusted R^2=0.743

The output of the standardized coefficients revealed the regression model below:

$$DOC_{predicted} = 0.58PSL + 0.25PSE + 0.22PSS$$

With the above model, PSL seemed to be the most powerful predictor of student's evaluation of the designed online courses. The outcome implied that every unit gained in PSL will increase a student's evaluation of the designed online courses by 0.58 units. PSE and PSS followed as second and third predictors respectively.

4. Discussion

The study attempted to gain an understanding of the degree to which a slightly adapted QM-Review standard; students' engagement, support, and learning reflected on students' perception of

designed online courses. A practical approach for implementing instructional strategies to promote positive effects on the quality of online education for better learning outcomes through student engagement and support in designed online courses has been well documented (Fiock, 2020; Richardson, et al., 2017). While online education continues to evolve in developing countries, especially in Africa (Kotouaa, et al., 2015), understanding factors such as well-designed online courses for effective learning outcomes is paramount (Palvia, et al., 2018). Ghana has been cited as one of the most progressive countries in Africa with the availability of online accredited courses yet, doubt remains on its impact on better learning outcomes (Kotouaa et al., 2015). The study reported on one such online education initiative by a public university in Ghana due to the ravaging nature of the COVID-19 pandemic on the global education calendar. In the study, members of the faculty ced a workshop that emphasized standards (QM) for designing online courses. These faculty members were introduced to the QM standards for the first time. Consequently, the study hypothesized students' perceptions of designed online courses (dependent variable) as a function of their perceived online learning, engagement, and support (the independent variables) which aimed to promote understanding of these four latent variables and the association that subsist between them.

A high positive perception was reported on the three independent latent variables (learning, engagement, and support) of the designed online courses. The most reported amongst participants students' perceived learning. This outcome suggested that the designed online courses enhanced students' assessment and measurement, delivery of instructional materials, and, accessibility and usability due to easy navigation and interaction with courses' components. Next, the participants reported a high perceived engagement of the designed online courses; an indication that the designed online courses enhanced learner activities and interaction as well as enabling course technology for the various course components to facilitate better learning outcomes. Perceived support, though the lowest ranked amongst the three, was reported quite at a high level. The result therefore suggested students support in technical, accessibility, academic services, and student services when engaged in the designed online courses. The results, thus suggested that respondents did not have to struggle to obtain diverse support services for better learning outcomes.

The above results reiterate several studies that emphasized that a well-designed online course (Castro & Tumibay, 2021; Duvall, et al., 2020) can result in student learning (Piña, 2018; Sadaf, et al., 2019) by incorporating student engagement (Martin & Bolliger, 2018; Sadaf, et al., 2019) and support (Elaasri & Bouziane, 2019; Varonis, 2014). The findings of the study reiterated the importance of essential designed features and pedagogical applications that stimulate the construction of knowledge. For instance, Duvall, et al., (2020) emphasized that designed online course features must promote students working privately, sharing and discussing their work with the class. In line with the findings of the study also, Martin et al., (2019) purported that an effective designed online course not only considers learner needs and interaction but is driven by a quality assurance process. Furthermore, the study outcome does resonate with Martin et al., (2018) assertion on online facilitation strategies to include instructor presence, instructor connection, engagement, and learning. Castro and Tumibay (2021) also emphasized the importance of instructional design and the active role an institution plays in terms of infrastructure for educators and students in online courses.

The extent to which the three independent variables; PSL, PSE, and PSS contributed to predicting participants' views on the designed online courses was further reported. The overall model of fit obtained revealed that the model explained approximately 78% of the total variance in students' views on the designed online courses; indicating a desired predictability and explanatory power for the designed online courses. The model's comparatively noticeable R-Square reiterated the essential role of the independent variables. This suggests that instructors of online courses should use LMS features that promote engagement and support to elicit better learning outcomes. The study further revealed that perceived learning is significant and the strongest predictor of students' perceptions of the designed online courses. This outcome resounds the assertion that online learning complements the traditional face-to-face approach (Araka, et al., 2021), promotes more student-centered learning

(Shivangi, 2020), improves students' grades as well as interaction with course materials (Hollowell, et al., 2017) and, motivation to gain knowledge (Young, 2014). A significant influence was also reported on students' views on designed online courses as a result of perceived engagement and support.

Additionally, the correlation analyses emphasized the dominance of learning over engagement and support. The output revealed that perceived learning had the strongest relationship to students' perception of the designed online courses compared to that of perceived engagement and support of the designed online courses. The stronger correlation analyses between PSL and PSE further reiterated Sadaf et al., (2019) assertion that the role of QM learner activities and interaction in promoting students learning and engagement cannot be overstated. These two variables appeared to be strong determinants of the perceived designed online courses and should not be disregarded by instructors. Another significant finding that was consistent with the works of Legon (2015) and, Robinson and Wizer (2016) was that perceived learning correlated positively with perceived support.

Furthermore, perceived engagement was significantly linked to support. Thus, supporting the assertion that learner support is vital to students' learning and engagement (Sadaf, et al., 2019). These results indicate that the more learning was perceived, the more students viewed the designed online courses to be engaging and supportive. This finding, therefore, seems to suggest that the designed online courses will be successful if emphases are placed foremost on promoting student engagement and supportive systems. This result contradicts some studies that have overemphasized the disadvantages of online education (De Paepe, et al., 2018; Hiranrithikorn, 2019) but reiterated the role QM plays in effectively promoting an online course environment that rivals or complements traditional face-to-face instructions. For instance, a study conducted by Astani et al., (2010) reported students as rating the standard of online learning as useful as conventional classroom learning.

5. Conclusion

The students reported a high positive perception of the overall design of online courses based on a modified QM-Review standard; student engagement, support, and learning. The strongest predictor of students' perceived designed online courses among the three independent variables was perceived learning. The study outcome also seemed to suggest that the success of designed online courses is dependent on the provision of student engagement and supportive systems. Thus, emphasizing that the designed online courses based on the modified QM-Review were highly perceived as beneficial for the students in terms of engagement, support, and learning. These results leave no doubt about the potential and benefits of adopting a QM-Review rubric for designing online courses. Considering that the majority of the participants (n=513, 97.5%) own smartphones, the institution under study's regular and distant programs could benefit from considering strategies for the implementation of guidelines or policies to promote the usage of the QM rubric for their online/blended instructions.

With keeping up with pedagogical standards of best practices and current trends in delivering online learning, training of faculty of the various Colleges of the institution under study on how to incorporate QM-rubrics into teaching and learning would be vital. Further, having a clear online education policy in place that can sustain and keep pace with an evolving world of digital infrastructure that enhances pedagogical practices can assist faculty in effectively designing online courses. Policies that will progressively institute a quality assurance online learning office to monitor and support the application of these standards can promote instructors' course design capabilities.

This study was not without limitations. First, the paper assumed that all the courses that participants took were designed following QM guidelines as providing training to the faculty does not guarantee that faculty followed the guidelines in designing their courses. Second, the paper could not inform whether students' perceptions were low during the 2019/2020 academic. A longitudinal study could have provided a more valid insight into the differences in students' perceptions. Third, the study was limited to only one faculty within a college or a university; thus, limiting the generalization of the study findings to the larger faculty population. Hence a need for a future longitudinal study among

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the larger faculty population within the study area about the QM adoption for instructions. Finally, the self-reported nature of the study measured individuals' beliefs which might been exaggerated or elicited based on social desirability bias. Despite these limitations, the outcome of the study draws attention to one of the best online pedagogical practices and strategies on how to implement guidelines for designing online courses for better learning outcomes, especially in the study's institution of the study and other institutions within a similar context.

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