www.ijte.net

Stakeholders' Perspective on the Quality of Virtual Learning Material in Google Classroom

Mary Rose Briones
Samar State University (SSU), Philippines

Maricar Prudente
De La Salle University, Philippines

Denis Dyvee Errabo
De La Salle University, Philippines

To cite this article:

Briones, M.R., Prudente, M., & Errabo, D.D. (2023). Stakeholders' perspective on the quality of virtual learning material in Google Classroom. *International Journal of Technology in Education (IJTE), 6*(4), 736-759. https://doi.org/10.46328/ijte.571

International Journal of Technology in Education
2023, Vol. 6, No. 4, 736-759 https://doi.org/10.46328/ijte.571

Stakeholders' Perspective on the Quality of Virtual Learning Material in Google Classroom

Mary Rose Briones, Maricar Prudente, Denis Dyvee Errabo

Article Info

Article History

Received:
06 April 2023
Accepted:
10 September 2023

Keywords

Virtual Learning Material (VLM)
Google Classroom
Online learning
Open SUNY Course Quality Review (OSCQR) Rubric
Stakeholders' perspective

Abstract

The COVID-19 pandemic stimulated education system worldwide to employ online learning to support learning despite difficult times. To respond to this challenge and to promote Sustainable Development Goal (SDG) 4, advocating quality education, a virtual learning material (VLM) for Biology was articulated in Google Classroom. Accordingly, this study aimed to evaluate its acceptability and conformity to the international standards for online courses using the Open SUNY Course Quality Review (OSCQR) rubric as the questionnaire. Respondents (N=40) involved four stakeholders: Senior High School Students, Pre-service Science Teachers, High School Teachers, and Science Instructors/Professors, with n=10 representatives each group. Their perspectives of the VLM acceptability in terms of Overview and Information, Technology and Tool, Design and Layout, Content and Activities, Interaction, and Assessment and Feedback were obtained through a Google Form by rating the 50-item questionnaire on a 4-point Likert scale together with two open-ended questions. With a grand mean of 3.81(SD=0.40), the findings revealed highly acceptable results. The qualitative responses also substantiated this result. Significant differences in the responses are also discussed, while the Cronbach alpha reliability test is high (α=0.923). Significantly, the VLM conforms with the international standards for online course design, suggesting it can be implemented among target students.

Introduction

The global pandemic brought by the Coronavirus Disease 2019 (COVID-19) has been a driving force for schools worldwide to shift from conventional face-to-face (f2f) classes to online learning. Consequently, many educational institutions turned their instruction into modalities that can prevent the spread of the virus (Tria, 2020; Ukata & Onuekwa, 2020). As of April 2020, more than 1.2 billion students were affected in more than 180 countries worldwide (Li & Lalani, 2020). The World Health Organization (WHO) confirmed on March 11, 2020, that the Philippines recorded more than 60 confirmed cases, all classified as local transmissions (WHO, 2020). On the same day, the Commission on Higher Education (CHED) in the Philippines released a memorandum that stipulates the advisory to mitigate the spread of COVID-19 in Higher Education Institutions (HEIs) by deploying distance learning, e-learning, and other alternative modalities if resources are available (CHED, 2020).

Indeed, online learning is gaining relevance today, not only because of f2f class suspension due to the global pandemic but, more importantly, because of its pivotal role in implementing SDG4, which advocates an inclusive, equitable, and quality lifelong education at all levels. This new vision in education towards 2030 also highlights integrating information and communication technology (ICT) into education to promote an effective and quality education for all (UNESCO, 2016). ICT integration is significant when students and teachers are distant (Ghavifekr & Rosdy, 2015). Before, ICT was a supplementary learning tool through computer-aided instructions (CAI) to help students achieve better learning (Wilson et al., 2018; Aktaruzzaman & Muhammad, 2011). With the health crisis brought by COVID-19, teachers and students are forced to adapt to the new normal and use ICTs as primary instructional materials (Tria, 2020; Bao, 2020; Sintema, 2020; Mulenga & Marban, 2020). Meanwhile, schools implemented classes at all levels and instructional delivery through distance learning modalities (UNESCO, 2020). Consequently, the suggested learning tools include Google, TV broadcasts, video lectures, and online platforms such as Google Classroom, messenger, Facebook, Edmodo, and YouTube, among others (UNESCO, 2020; CHED, 2020). Therefore, teachers are challenged to continue implementing instruction via any of these useful educational technologies.

Google Classroom as Learning Management System (LMS)

In this study, Google Classroom served as the learning management system (LMS) of the VLM for Biology. As an LMS, Google Classroom allows online communication, viewing videos or presentations, and joining collaborative works (Iftakhar, 2016). It helps create questions and assignments, reuse announcements, store files in Google Drive, and send emails to students (Iftakhar, 2016). Operationally, LMS referred to the Google Classroom where a VLM for Biology was articulated, particularly for Cell and Molecular Biology courses in teacher-education college. Studies documented that Google Classroom increases students' participation and active learning, improving classroom dynamics (Heggart & Yoo, 2018). Briones and Errabo (2021) showed that students perceived the use of Google Classroom as highly acceptable, provided the grand mean of 4.79 (SD=0.31) (scale of 5). Specifically, the components studied were ease of access, perceived instruction delivery, perceived usefulness, communication and interaction, and students' satisfaction. The findings coincide with the recommendation of Shaharanee et al. (2016) to use Google Classroom as a pedagogical tool. During the COVID-19 pandemic, the use of Google Classroom was evident even among schools implementing Moodle-based LMS, in which authors observed its implementation under the moderate category (Makruf et al., 2022). Thus, Google Classroom is useful for distance education.

Distance Education and Online Learning

Distance education refers to using technologies and particular institutional organizations so learning can happen at a different place as part of teaching and planning to learn (Siemens et al., 2015). It is used interchangeably with online learning, online course, and e-learning (Sun & Chen, 2016; Simonson & Seepersaud, 2019). Because online learning takes place at a different location, the role of faculty is crucial in knowledge construction in distance education (Markova et al., 2016). They should provide an instructional design that is educationally effective, high-quality programs, and maximize the ICT interaction in an online learning environment (OLE) (Markova et al.,

2016). This quality education is associated with faculty preparation, potentially impacting quality instruction in an OLE because their well-preparation is one factor that makes online learning effective (Gurley, 2018). Their role in designing online material makes distance learning effective while incorporating relevant course content and emphasizing student support and assessment technique (Markova et al., 2016).

Pangeni (2016) suggested that interactive learning tools could enhance the web-based learning environment and student support system to foster quality education in open distance learning. Rapanta et al. (2020) emphasized the aspects a teacher needs to consider in the instructional design for online learning. The study revealed that some of the emergent aspects of online learning activities that teachers should consider in the preparation phase include peer evaluation (under assessment), involvement of stakeholders (under roles), pace, focus on tasks and activities rather than content, peer collaboration and group assignments (under task), awareness on modes of interaction and tools, and infrastructure accessible to students (under tools and resources).

Teachers' Preparations for Implementing an Online Learning Environment

Other studies documented school preparedness for online learning implementation amidst the COVID-19 pandemic. For instance, in China, where various universities offer massive online courses, Chung and Fang (2020) found that factors such as teaching inputs of instructors, platform function, teaching strategy and method, and teachers' training on online learning platforms were some of the main factors that influence the preparedness in the case of instructors. In addition, the problems found were contents that could be more suitable for online instruction, insufficient student participation, insufficient e-teaching resources, insufficient online technical support, incongruent teaching strategy and online instruction, and incongruent assessment evaluation and online instructions (Chung & Fang, 2020). Therefore, gaps are also related to teachers' preparation. In the Philippines, HEIs have closed in the Philippines because schools must prepare to implement an online system (Toquero, 2020). Other authors noted that sudden shifts to new formats, such as online classes without due preparation, negatively affected learning performance (Aqdas et al., 2023). Bao (2020) noted that the preparation for online learning is one of the challenges among faculty members in HEIs because they need to gain experience in online teaching. Besides, the well-equipped preparation of teachers using ICT tools and facilities is a crucial factor in achieving successful technology-based teaching and learning (Ghavifekr & Rosdy, 2015). Inevitably, the COVID-19 pandemic challenges teachers to discern continuous provision for and delivery of quality education despite exceptional times (Tria, 2020).

Research Problem

With the issues and demands discussed in the preceding sections, the researchers considered determining the acceptability of a pre-developed VLM for Biology as a preliminary study before its implementation. In this manner, the researchers can examine the quality of the VLM to address issues on social interaction, student support, content congruency with activities and assessment methods, teaching-learning resources, and feedback mechanisms. Consequently, this may lead to the effective implementation of the VLM among target users, whether in pure online or hybrid classes, to continuously support quality instruction even during exceptional times.

This study aims to assess the acceptability of a pre-developed VLM to determine whether it conforms to the universal quality standards for online material. Specifically, it intends to address the following research questions:

1. What is the perspective of the stakeholders on the acceptability of VLM in terms of:
   1.1 Overview and Information
   1.2 Technology and Tools
   1.3 Design and Layout
   1.4 Content and Activities
   1.5 Interaction; and
   1.6 Assessment and Feedback
2. What is the level of measure of internal consistency of the constructs in the OSCQR questionnaire?
3. Which part of the VLM is easiest or most difficult to understand?
4. Is there a statistically significant difference in the response of the stakeholders?

Null hypothesis (H_0): The responses of the four groups of stakeholders are the same.

Method

Research Design

This study employed descriptive survey research following the explicit mixed method approach. This method is concurrent, inductive, and integrating. It entails the simultaneous collection of quantitative and qualitative data, generating themes through an inductive approach, and integrating two types of data using the other as supportive Information (Creswell, 2003). Consequently, the needed data to determine the acceptability of the VLM was obtained using a numerical data set on the Likert scale together with a qualitative response from the stakeholders.

Research Sampling

Purposive sampling was used in this study considering the selection criteria for each group of stakeholders. Specifically, the stakeholders included Senior High School (SHS) Students, Pre-service Science Teachers, High School Science Teachers, and Science Instructors/Professors. The SHS students must be enrolled in the Science, Technology, Engineering, and Mathematics (STEM) track in either Grade 11 or 12.

Pre-service teachers must be enrolled in the Bachelor of Secondary Education major in Science program and have taken the courses Genetics and Biochemistry (CHED, 2017). Meanwhile, the High School Science teachers must handle either Biology or Chemistry courses in Senior or Junior High in their area of assignment. Lastly, for the Science instructors/professors, qualifications included (a) specialization in Biology or Chemistry and taught or currently teaching related courses, (c) experienced designing instructional materials such as lesson plan, syllabi (with learning plan), or modules, and (d) earned units or graduated with a related masters or a doctorate degree. Furthermore, because this research serves only as a preliminary study before the implementation of the VLM, n=10 individuals from each group were requested to participate in this study, limiting the number to only N=40.

Research Instrument

The Open SUNY Course Quality Review (OSCQR) rubric was used to assess the quality of VLM. Developed by the State University of New York (SUNY) through Open SUNY® Online Teaching and licensed under Creative Commons 4.0, it hopes to provide a set of criteria for online course preparation to establish inclusivity and quality online courses (see Appendix A and B). It covers fifty (50) standards (S): Overview and Information (S1-S10), Technology and Tools (S11-S15), Design and Layout (S16-28), Content and Activities (S29-37), Interaction (S38-S43), and Assessment and Feedback (S44-S50) (access rubric via https://oscqr.suny.edu/). The adopted OSCQR rubric served as the research instrument for the quantitative data, with 50-item questions answerable on a 4.0 Likert scale where 1-not acceptable and 4-highly acceptable. For corroboration, the questionnaire included an open-ended question on which part is easiest or most difficult to understand to get the qualitative data.

Research Ethics

This study observed ethical considerations. Before conducting the survey, the Open SUNY® Online Teaching director granted permission to use the OSCQR rubric. In addition, the researchers identified qualified respondents through the recommendation of colleagues in science teaching. Communication with each of the pre-identified respondents was initially through social media (Facebook Messenger). However, the researchers ensured that all the respondents consented to getting their email addresses. Upon consent, each respondent received a formal letter request sent via email. Noteworthy, the researchers secured an informed consent. The respondents were informed about the nature and objective of the study, their will to withdraw at any time, and the confidentiality of their identity in observance of the Philippine Data Privacy Act of 2012, the non-risky participation, the procedure of evaluating the VLM which includes Do's and Don'ts, and the treatment of the data gathered from them. Thus, the Google Form included an option to tick a box for their voluntary participation.

Data Gathering and Data Analysis

Google Form was used to administer the instrument. The researchers had set the Google Form such that the "Yes" response to participate voluntarily in the study redirects the respondents to the procedure of joining the Google Classroom where the VLM is. The subsequent section provided them with the OSCQR rubric to assess the VLM. Thus, the data gathering procedure was merely online.

All responses obtained from the Google Form were subjected to descriptive and inferential analyses, including frequency, mean, standard deviation, and Chi-square. The descriptive statistics were utilized to assess the acceptability of the VLM, thereby addressing the research question (RQ) 1. Table 1 presents the range, interpretation, and decision relative to the responses.

In addition, the Cronbach Alpha measure of internal consistency helped assess the reliability of the constructs in the questionnaire to address RQ2. Furthermore, because the number of participants from each stakeholder group was limited, the inferential analysis was limited to a non-parametric test, utilizing Chi-square to test for the

significant difference in the responses among the groups to answer the RQ3.

Table 1. Range and Interpretation of Responses in OSCQR Rubric

Likert Scale	Interval	Interpretation
4	3.50 to 4.00	Highly Acceptable
3	2.50 to 3.49	Fairly Acceptable
2	1.50 to 2.49	Least Acceptable
1	1.00 to 1.49	Not Acceptable

The researchers also analyzed the qualitative data to support the quantitative findings. Thematic analysis was followed through an inductive approach, otherwise known as open coding, to provide supportive Information to the quantitative response. Accordingly, it was done manually in Excel to code and identify themes following the protocol Bree and Gallagher (2016), highlighting data that say something in common with the same color. Themes were then identified from the open codes to capture a significant and interesting pattern about the open-ended question to address RQ4

Results

Feedback on the Acceptability of the VLM

The stakeholders' perspectives of the six (6) components shown in Fig. 1, represented by mean scores ranging from 3.64 to 3.90, are interpreted as highly acceptable, indicating that the VLM conforms to the international standards for a quality design of an online course material as measured by the OSCQR rubric.

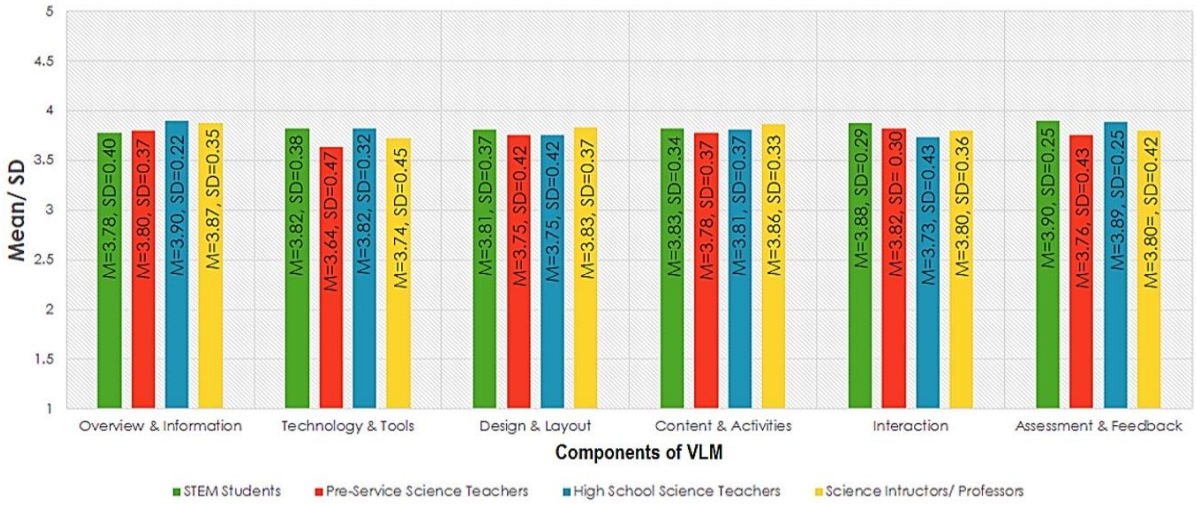

Figure 1. Stakeholders' Perception of the Quality of the VLM

Specifically, the highest mean scores are garnered in the components Overview and Information (M=3.90; SD=0.22) and Assessment and Feedback (M=3.90; SD=0.25), rated by high school teachers and STEM students, respectively. The results indicate more importance credited to course information and learning assessment for teachers and students. Authors suggest ideal online course design for scaffolding activities such as the provision

of technical support and tutorials, the inclusion of a syllabus and other learning resources at the early stage before students proceed with their independent learning tasks as they develop understanding and skills (Jumaat & Tasir, 2014; Lister, 2014; Johnson & Davies, 2014; Belland, 2017; Sartika et al., 2020). That said, the findings on highly accepted Overview and Information are perhaps due to the provision of scaffolding activities as requisite skills and knowledge. In addition to that is a detailed instruction about the use of the VLM with the aid of a printable syllabus with an observance on the congruency of content, activities, and learning resources that are likewise reflected in the VLM, as well as the orientations on how to use learning resources and educational applications to ensure student support. The following set of verbatim substantiate such findings:

> *"The e-module orientation was the easiest to understand because it is explained in detail but also in a precise and concise manner. All necessary materials for understanding how the course works are readily available…." [STEM Student #10]*
>
> *"Part of the VLM were the e-module introduction, overview and orientation, wherein learners have the chance to start exploring with the help of tutorials and technical help, as such exploring and understanding basics and the "new" were easier." [Pre-service Science Teacher #6]*

Based on the findings obtained in this study, the VLM satisfies the ideals for the availability of scaffolding activities specified in the literature. However, future undertaking on the implementation of the scaffolding activities is highly encouraged to make conclusive results on its efficacy. In addition, the assessment and feedback findings may be associated with the different learning assessments, the grading policies and system specified in the syllabus, the grade book in Google Classroom, the rubrics for all graded activities, and the Feedback Form for end-users. The findings suggest that the VLM demonstrates these, supporting the literature about the best practices by excellent performing online teachers providing necessary instructions for various assignments or assessment activities and corresponding rubrics, grading procedures and course policies (Lister, 2014; Baldwin et al., 2018).

The stakeholders' qualitative response corroborates this as stated in the following verbatim:

> *"Assessment and Evaluation tools are easy to understand because every level of assessment has corresponding rubrics to ensure that you follow the standard grading in every activity… By having those rubrics, students can create excellent output." [Pre-service Science Teacher #3]*
>
> *"…the instructions of every activity included. The learners will not find it hard to digest and process the activities since they are provided and guided with a step-by-step process on how they will accomplish the tasks..." [High School Teacher #3]*

Meanwhile, the relatively lower mean score recorded in component Technology and Tools (M=3.64; SD=0.47) rated by Pre-service Science Teachers may be associated with issues with access or the students' unfamiliarity or difficulty adapting to new educational applications, as revealed in their qualitative responses. Some narrated that:

> *"…I struggled to access the orientation of devices for participating in the course…" [Pre-service Science Teacher #4]*
>
> *"…I am not very familiar with it (technology tools), and it is hard to adapt, especially since we are currently doing online." [STEM Student #9]*

Accessibility is also a concern of students using online learning materials, such as time in accessing their LMS (Shanker & Hu, 2008) and technical issues with loading and logging in (Juhary, 2014). However, such a relatively lower mean score is not a demerit to the overall result of the perceived acceptability of the Technology and Tools in the VLM because it is still interpreted as highly acceptable. Hence, the researchers surmise that although some encountered difficulty accessing the VLM, the feedback regarding Technology and Tools is still good. Nevertheless, this suggests revisiting and modifying this aspect of the VLM to address the concerns raised by the stakeholders.

In terms of the other three components—Interaction, Content and Activities, and Design and Layout, the mean scores ranged from 3.75 to 3.88, also interpreted as highly acceptable. The favorable result obtained in the Interaction component could be attributed to the availability of the Students' e-Lounge, where students may post feedback regarding the execution of any given collaborative activities, particularly their active participation in group works. A stakeholder narrated:

> *"The Student's e-lounge personally is the easiest to understand because in this part, you can voice out different questions or opinions about the course." [STEM Student #2]*

Another factor that contributing to this finding is the provision for varied learning activities across the segments in the weekly module in the VLM, in which learners have the freedom to make the comment section in the Google Classroom as a discussion forums thread. Likewise, the findings may have satisfied the recommendation of Siemens et al. (2015), specifying an online teaching strategy characterizing instructional support to collaborative and cooperative work and social interaction among online learners and instructors.

When it comes to Content and Activities, authors suggest that course designers should consider the scrutiny of the electronic content (Al-alwani, 2014) as well as the various activities, such as authentic tasks and reflective activities (Lister, 2014), for effective online learning. Based on the highly acceptable responses of stakeholders, the contents and activities may contribute to effective online learning as specified by Al-alwani (2014) and Lister (2014) when implementing the VLM in Google Classroom.

Finally, the favorable feedback on Design and Layout can be attributed to the straightforward, uniformly formatted weekly module and segmented lesson delivery, as well as the instructions for every learning activity. Significantly, the employed principle of Bao (2020) proposing to divide topics into modules might have contributed to this result. Lister (2014) posited that aside from syllabus and content presentations, another factor that needs considerable attention in the course structure for online learning is the Information and instructions about the assignments. Likewise, Gilbert (2015) noted that one way to increase the understanding and participation of online learners is to provide them with clear directions when providing educational opportunities.

Reliability of Constructs in the Survey Questionnaire

The Cronbach α measure of internal consistency helped assess the reliability of the constructs in the questionnaire. The result shows that the α value is 0.923. An excellent reliable construct is an α value higher than .9 (George &

Mallery, 2005). Therefore, the result has passed the reliability test using the Cronbach α measure of internal consistency on the 50-item questionnaire in this study.

Stakeholders' Qualitative Response on the Quality of the VLM

In the earlier presented results for each component, Components 1 (Overview & Information) and 6 (Assessment & Feedback) gained the highest overall mean (M=3.84). Likewise, the overall feedback revealed the highest mean (M=3.90) for both components, as shown in Figure 1. In addition, the design and layout (M=3.78) are also perceived as easy to understand. These quantitative findings are interpreted as highly acceptable based on the stakeholders' perspectives—the thematic analysis's generated themes in Table 2 support such quantitative findings.

Table 2. Stakeholders' Qualitative Response on the Easiest Part of VLM

Themes	**Category**	**Code**	
		Latent Code	***Semantic Code (response excerpts)***
Information or detailed instructions in the introduction and orientation are understandable and clear to the VLM users.	Clear and easy-to-understand information and detailed instructions	Step-by-step instructions for every activity	*Instructions for every activity are provided and guided with a step-by-step process.*
		Clearly and correctly stated instructions for efficient use of learning material.	*Instructions/procedures were clearly stated and instructed correctly.*
			Clear instructions significantly contributed to the efficient use of the learning materials.
		Easy-to-understand instructions	*Words used in instructions are easy to comprehend*
			Instructions are very literal and easy to understand
		Simple and student-friendly Information	*VLM is student-friendly, with Information that is simple to comprehend*
		Detailed and understandable orientation	*e-module orientation was the easiest to understand because it is explained in detail*
		Clear and factual Information is well-presented	*Overview and Information are clearly stated, and factual data are presented well*
The availability of rubrics and clarity of instructions in	Assessment methods with clear instructions	Clarity and availability of rubrics for every activity	*rubrics are clear and well thought of*
			Every level of assessment has corresponding rubrics.

Themes	Category	Code	
		Latent Code	***Semantic Code (response excerpts)***
assessment activities provide ease and make assessment methods easy to understand	and rubrics	Assessments with clear instructions	*The assessment tool gives clear instructions.*
		Rubrics make assessment easy	*Provides specific rubrics that will assess work easily*
Uncluttered topics or instructions and well-organized classwork provides an ease to understand the modules	Consistent and well-arranged course information and modules/topics in the classwork	Itemized classwork makes work easier	*Itemizing which activity comes before or after another helps students track their classwork with lesser effort.*
		Uniformly formatted topics	*Module proper itself, where there are topics, has a uniform format.*
		Consistent material	*Consistency of the material from the very beginning down to the last part*
		Properly sequenced classwork	*The outline of the VLM can be easily understood because it is arranged in sequence in the classwork portion.*
		Well-organized course information presentation	*Course information was well-organized and presented*
		Organized chunks of topics	*The structure of the topics and the way they are divided are organized*

The following are the verbatim of the stakeholders' responses on which part is easiest to understand, thereby addressing RQ3:

> *"The easiest part to understand on the VLM are the instructions for every activity included. The learners will not find it hard to digest and process the activities since they are provided and guided with a step-by-step process on how they will accomplish the tasks for each activity on the modules". [High School Science Teacher #3]*

> *"The instructions/procedures were the easiest to understand; everything was clearly stated and instructed properly". [High School Science Teacher #9]*

> *"The course information was well-organized and presented, and I understood everything on it. Furthermore, the VLM is student-friendly, with Information that is simple to comprehend for any learner. There is a prior announcement for any activity, preventing pupils from being confused. Furthermore, the course is presented straightforwardly and accurately, ensuring that pupils are not distracted from*

the material they should be studying. As a result, using VLM will be a successful tool for learning more, particularly in this age of technology." [Pre-service Science Teacher #1]

"Modular presentation of learning materials gave students the most convenient and encouraging learning environment. Itemizing which activity comes before or after another helps students track their classwork straightforward and with lesser effort" [Science Instructor/Professor #2]

"The e-Module Introduction was the easiest to understand since it is where the instructions and guidance as how to navigate the Google classroom; it also includes the e-module overview…." [STEM Student #6]

"The e-module orientation was the easiest to understand because it is explained in detail but also in a precise and concise manner. All necessary materials for understanding how the course works are readily available, so I believe this was the easiest part to understand." [STEM Student #10]

Meanwhile, the findings showed that the least overall mean (M=3.76; SD=0.45) is recorded in the component Technology and Tools. Simultaneously, gained the lowest mean (M=3.64; SD=0.47) in the overall feedback among pre-service teachers presented in Figure 1. Table 3 presents the result of the thematic analysis to support the said findings.

Table 3 Stakeholders' Qualitative Response on the Difficult Part of VLM

Themes	**Category**	**Code**	
		Latent Code	***Semantic Code (response excerpts)***
Difficulty in understanding educational apps begins with struggle in accessing devices, improperly functioning navigation buttons, and inability to use due to unfamiliarity and inadaptability.	Struggle in navigation and accessing contents and devices	Navigation is not correctly working	*Navigation is not presented the moment the cursor is pointed to the title.*
		Accessing the technical part is a struggle	*Technical part because I had some struggle in accessing the orientation of devices*
	Technical tools require familiarity, adaptability, and skills	Self-implementation of technical tools are difficult	*Instruction for technical tools was difficult for me; implementing it on my own is certainly difficult*
		Inability to handle/utilize technologies	*Not all students have the technological abilities required.*
			Difficult for students who are not well-versed in using Google Classroom
		Unfamiliarity and inability to adapt to	*Technology tools because I am not very familiar with it and it is hard to adapt*

Themes	Category	Code	
		Latent Code	***Semantic Code (response excerpts)***
		technical tools	
		Learning to utilize apps is time-consuming.	*Learning how to utilize the apps may consume so much time.*
	Difficulty in understanding contents and several educational apps	Varied educational apps are difficult to understand	*Tutorials and Technical help are the most difficult to understand because it is composed of different educational apps*
		Video tutorials are difficult to understand	*The content of the video tutorials is sometimes difficult to understand*
Overwhelming lessons and activities may lead to an inability to quickly understand the modules	Overwhelming lessons and activities	Too many topics in classwork are overwhelming	*Classwork presentation was somehow overwhelming, with a lot of topics.*
		Too many activities	*Many activities were posted, and it took much work to tell which to finish.*

The verbatim responses excerpted below indicate that some stakeholders perceived some aspects of the *Technology and Tools* could be easier to understand.

> *"Tutorials and Technical help are the most difficult to understand because it is composed of different educational apps that are difficult to utilize. Every educational app has different technical properties that are difficult to handle..." [Pre-service Science Teacher #3]*

> *"I think the technical part is because I struggled to access the orientation of devices for participating in the course. The technology accessibility." [Pre-service Science Teacher #4]*
> *"...I think it would be difficult for students who are not well versed in using Google Classroom and other apps." [Pre-service Science Teacher #9]*

> *"The most difficult part for me to understand was about technology tools because I am not very familiar with them, and it is hard to adapt…use technology to access some school-related activities. Any technology tools, especially computers and other technical stuff, are difficult to understand and need skills and knowledge to adjust and learn more about technology tools." [STEM Student #9]*

Hence, scaffolding activities are necessary before online education activities require various applications. While the findings are still interpreted as highly acceptable, the researchers may still consider reviewing and refining

these aspects of the VLM in Google Classroom. According to Johnson and Davies (2014), online course designers should consider links and help features, online tutorials, and communication tools to support students in the virtual learning environment. Likewise, Bao (2020) posited that teaching assistance provided through online video tutoring to students leads to effective online learning. In this manner, teachers could help develop students' digital literacy necessary for their learning encounters using virtual learning materials.

Digital literacy enables an individual to independently apply digital skills, such as using internet resources and other digital technologies to communicate and interact with various cultures, find and select Information, and think critically and evaluate Information (Hague, 2010). Thus, teachers should have a quality check of the tutorial videos and other technical help features to ensure that the contents are of the level of the students so they would understand the learning resources that could also facilitate their digital literacy. Hence, they can apply their learning as they execute the activities while utilizing online educational applications, whether in a pure online modality or simply incorporating educational technologies in classroom activities.

In addition, other stakeholders were concerned about the presentation of some lessons and activities at a glance of the VLM. Some narrated:

> *"However, I find the Classwork Presentation somehow overwhelming with many topics included aside from the Class Lessons. The class lessons/topics are the most important classwork content. So maybe, sending the e-module introduction, e-module training & tutorials, and student's e-lounges, among others, to the Stream Page will de-clutter the Classwork Page…." [Science Instructor/Professor #2]*

> *"The part of the VLM that is difficult to understand is the learning activity. There were many activities posted, and it was hard to tell which one to finish, but its instructions were stated well". [STEM Student #4]*

This aspect in the VLM could be addressed by critically following the suggestion of Bao (2020) in dividing contents into manageable chunks, and online instructors should also present the lessons in the classwork one at a time. Consequently, students must focus on which lessons to go through and what activities to prioritize in a specific module which could make their online learning more manageable while making their experience meaningful and engaging.

Response Differences

The result of the Chi-square test shows that 29 of 50 standards (1, 3, 4, 5, 7, 9, 12, 17, 18-20, 22, 24, 26, 28, 30-34, 36, 37, 39, 40, 41, 44, 46, 48-50) revealed similar perception on the acceptability of the VLM among the four groups of stakeholders because the chi-square test result is less than the computed critical value. The results are not significant to reject the H_0. Perceptions differ in the remaining 21 standards (2, 6, 8, 10, 11, 13-16, 19, 23, 25, 27, 35, 38, 42, 43, & 45) because the computed critical value is less than the Chi-square test result. This supports the relatively more spread responses based on the standard deviation results observed in these standards. Hence, the results are significant enough to reject the H_0.

Discussion

This study reports on the quality of the VLM for Biology as an online instructional material. Based on the findings, stakeholders put great importance on the online material's overview and detailed instruction necessary for using such virtual learning material so students can understand how to proceed with the learning activities and meaningfully experience their online learning. Noteworthy, considering that not all are accustomed to using Google Classroom as the educational technology may pose difficulty among the students who are end-users of the VLM; such might explain why Technology and Tools garnered the relatively lower mean among other components based on the feedback. Significantly, scaffolding before an encounter with online learning is necessary to ensure students will be successful with minimal or no teacher presence because they have to be independent and actively learn using the online material. Likewise, Bradley (2021) has covered the students' autonomy to self-regulate their progress using essential learning resources (i.e., syllabi, assignments, discussion forums, and others) in a review paper.

Specifically, this study adheres to the principles of Belland (2017), in which scaffolding activities are presented through ICT tools that can extend and enhance students' capabilities as they engage in their learning tasks using the VLM. This makes the VLM engaging because it ensures that students have prior experience of the learning resources to be used in the actual activities of the students. If not, it would only reflect the errors of other online learning resources in which students do not find technologies easy to use because of their lack of experience on how to utilize them before their online courses (Alharthi, 2020).

The stakeholders also valued the Assessment and Feedback, as well as the Content and Activities of the VLM. Such is evident in their feedback on the detailed instructions on each activity with corresponding assessment rubrics to ensure that students are well-guided as they go through the learning tasks, thereby ensuring quality performance and outputs as expected. Indeed, the findings substantiate the authors' assertion on best practices for online learning such as grading procedures, information or instructions about assignments (Lister, 2014), provision of rubrics for all graded assignments, an assessment aligned with learning objectives, and course policies for behavior expectation among students (Baldwin et al., 2018). In contrast, assessment activities become problematic in terms of students' inability to properly execute because of less facilitation from instructors or insufficient orientation for e-learning strategies that could guide them well, for instance, in their formative assessments (Ndibalema, 2020).

Likewise, the stakeholders appreciated Interaction in the VLM, given the provisions for social interaction through the Student e-Lounge, the class comment section, group dynamics, and the instructions for doing so across the e-segments in their learning experience. Bolliger and Martin (2018) considered the provision of a virtual lounge as one of the essential online teaching strategies that can support student engagement has been demonstrated to be true in this study. Findings further manifest one of the principles that online instructors should consider, according to Bao (2020), about the principle of high-quality participation in improving students' online learning. Furthermore, Altowairiki (2021) specified that one necessary strategy to prepare students for online collaboration is to provide clear expectations and requirements set for their learning tasks to achieve desirable learning

outcomes. Otherwise, students would experience sense of isolation that could negatively impact their intent to effectively use their online learning resources due to lack of socialization or interaction (Mokhtar et al., 2020; Bruso et al., 2020; Biwer et al., 2021).

Conclusion

In conclusion, the VLM in Google Classroom is highly acceptable regarding all the components investigated in this study. This shows that the VLM addresses the issues on the necessary course information, the congruency of content and activities/learning assessments, availability of channels for feedback and teaching-learning resources, activities with detailed information and corresponding rubrics for graded assessment, and the provisions for student support and social interaction. Significantly, the findings showed that the respondents highly accepted the VLM in the six (6) components, reflecting the quality standards for an online material as specified in the OSCQR rubric. Henceforth, the VIM may offer quality online learning for its intended end-users once it is adopted and implemented in the teaching-learning activities for the Cell and Molecular Biology course.

Recommendations

Given the fewer representatives from each group of stakeholders, future studies may consider more research participants to establish a better picture of factors ensuring the quality and efficacy of virtual instructional materials. This study recommends that future studies consider determining its affordances and efficiency in a pilot study before its actual utilization in Cell and Molecular Biology courses. Furthermore, quality assurance of instructional materials in any online learning environment is encouraged. In this manner, one can ensure that students understand the content, that lessons are in manageable chunks to prevent confusion, and finally, assess the familiarity and adaptability of students of any online educational applications such that ease of use, navigation, and access not compromised.

Acknowledgements

The OSCQR Online Course Quality Rubric (OSCQR) was developed by the State University of New York (SUNY) through Open SUNY® Online Teaching (https://online.suny.edu/onlineteaching), and is made available under the Creative Commons Attribution 4.0 International License (CC By 4.0). To view a copy of this license, visit https://creativecommons.org/licenses/by/4.0. The authors would like to extend heartfelt thanks to all the evaluators of the VLM who served as stakeholders and contributed to the success of this study.

References

Aktaruzzaman, Md., & Muhammad, K. (2011). A comparison of traditional method and computer-aided instruction on students' achievement in educational research. *Academic Research International*, *1*(3). ISSN 2223-9553. http://www.savap.org.pk/journals/ARInt./Vol.1(3)/20122(1.3-26).pdf

Al-alwani, A. (2014). Evaluation criterion for quality assessment of e-Learning content. *E-Learning and Digital Media, 11*(6). http://dx.doi.org/10.2304/elea.2014.11.6.532

Alharthi, M. (2020). Students' attitudes toward the use of technology in online courses. *International Journal of Technology in Education (IJTE), 3*(1), 14-23. https://files.eric.ed.gov/fulltext/EJ1264084.pdf

Altowairiki, N. (2021). Online collaborative learning: Analyzing the process through living the experience. *International Journal of Technology in Education (IJTE), 4*(3), 413-427. https://doi.org/10.46328/ijte.95

Aqdas, S., Ahmed, A., & Soomro, M. A. (2023). Exploring the impact of online classes on students' performance during Covid-19: Voices from Pakistan. *International Journal of Instruction, 16*(1), 753–766. https://doi.org/10.29333/iji.2023.16142a

Baldwin, S., Ching, Y.-H., & Hsu, Y-C. (2018). *Online course design in higher education: A review of national and statewide evaluation instruments*. *Tech Trends*. Springer. https://doi.org/10.1007/s11528-017-0215-z

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies, 2*, 113–115. https://doi.org/10.1002/hbe2.191

Belland, B. R. (2017). Instructional scaffolding in STEM education, strategies and efficacy Evidence. *Springer Open*. https://doi.org/10.1007/978-3-319-02565-0

Biwer, F., Wiradhany, W., oude Egbrink, M., Hospers, H., Wasenitz, S., Jansen, W., & de Bruin A (2021). Changes and adaptations: How university students self-regulate their online learning during the COVID-19 pandemic. *Front. Psychol*., *12*, 593-642. doi: 10.3389/fpsyg.2021.642593

Bolliger, D. U., & Martin, F. (2018). Instructor and student perceptions of online student engagement strategies. *Distance Education, 39*(4), 568-583. https://doi.org/10.1080/01587919.2018.1520041

Bradley, V. M. (2021). Learning Management System (LMS) use with online instruction. *International Journal of Technology in Education, 4*(1), 68-92. https://doi.org/10.46328/ijte.36

Bree, R. T., & Gallagher, G. (2016). Using Microsoft Excel to Code and thematically analyze qualitative data: a simple, cost-effective approach. *All Ireland Journal of Higher Education*, *8*(2). http://ojs.aishe.org/index.php/aishe-j/article/view/[281]

Briones, M.R.B, & Errabo, D.D.R. (2021). Student's voice of e-learning: implication to online teaching practice. *Proceedings of the 2021 3rd International Conference on Modern Educational Technology (ICMET 2021)*. Association of Computing Machinery (ACM) New York, NY, USA. https://doi.org/10.1145/3468978.3468987

Bruso, J., Stefaniak, J., & Bol, L. (2020). An examination of personality traits as a predictor of the use of self-regulated learning strategies and considerations for online instruction. *Educational Technology Research and Development, 68*(5), 26592683. https://doi.org/10.1007/s11423-020-09797-y

Commission on Higher Education. (2020, December 15). CHED COVI1-19 Advisory No. 3. Retrieved from https://ched.gov.ph/wp-content/uploads/CHED-COVID-2019-Advisory-No.3.pdf

Chung, C., & Fang, M. (2020). E-Learning and online instructions during the 2019 novel coronavirus disease (COVID-19) epidemic. *Journal of Physics: Conf. Series.* 1574 012166. Retrieved from https://iopscience.iop.org/article/10.1088/1742-6596/1574/1/012166/pdf

Commission on Higher Education. (2020, December 5). CHED Memo 75 s. 2017. Retrieved from https://ched.gov/cmo-75-s-2017/

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approach* (2nd ed.). Thousand Oaks, CA: Sage.

George, D. & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference*. 11.0 update (4th ed.). Boston: Allyn & Bacon.

Ghavifekr, S. & Rosdy, W. A. W. (2015). Teaching and learning with technology: effectiveness of ICT integration in schools. *International Journal of Research in Education and Science, 1*(2). Retrieved from https://files.eric.ed.gov/fulltext/EJ1105224.pdf

Gilbert, B. (2015). *Online learning reveals the benefits and challenges*. Education Masters. Retrieved from Fisher Digital Publications. Paper 303. https://fisherpub.sjfc.edu/education?_ETD_masters/303

Gurley, L.E. (2018). Educators' preparation to teach, perceived teaching presence and perceived teaching presence behaviours in blended and online learning environments. *Online Learning, 22*(2), 197–220. https://doi.ord/10.24059/olj.v22i2.1255

Hague, C., & Payton, S. (2011). Digital literacy across the curriculum. *Curriculum Leadership, 9*(10). (2022, January 9) http://www.curriculum.edu.au/leader/default.asp?id=33211&issueID=12380

Heggart, K., & Yoo, J. (2018). Getting the most from Google classroom: a pedagogical framework for tertiary education. *Australian Journal of Teacher Education, 43*(3). http://dx.doi.org/10.14221/ajte.2018v43n3.9

Iftakhar, S. (2016). Google Classroom: what works and how. *Journal of Education and Social Sciences,* 3, ISSN: 2289-9855. Retrieved from http://jesoc.com/wp-content/uploads/2016/03/KC3_35.pdf

Johnson, G., & Davies, S. (2014). Self-regulated learning in digital environments: Theory, research, praxis. *British Journal of Research, 1*(2), 1-14.

Juhary, J. (2014). Perceived usefulness and ease of use of the learning management system as a learning tool. *International Education Studies, 7*(8). http://dx. doi.org/10.5539/ies.v7n8p23

Jumaat, N. F., & Tasir, Z. (2014). Instructional Scaffolding in Online Learning Environment: A Meta-Analysis. In *International Conference on Teaching and Learning in Computing and Engineering*. https://doi.org/10.1109/LaTiCE.2014.22

Li, C., & Lalani, F. (2020, November 15). T*he COVID-19 pandemic has changed education forever*. World Economic Forum. Retrieved from https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/

Lister, M. (2014). Trends in the Design of E-Learning and Online Learning. *MERLOT Journal of Online Learning and Teaching*, *10*(4).

Markova, T., Glazkova, I., & Zaborova, E. (2017). Quality issues of online distance learning. *Procedia - Social and Behavioral Sciences, 237*, 685-691, https://doi.org/10.1016/j.sbspro.2017.02.043.

Makruf, I., Rifa'i, A. A., & Triana, Y. (2022). Moodle-based online learning management in higher education. *International Journal of Instruction, 15*(1), 135-152. https://doi.org/10.29333/iji.2022.1518a

Mokhtar, S., Hilaluddin, T., & Nik Nazli, N. N. N. (2023). Challenges impacting students' intention to effectively use e-learning method in a virtual learning environment. *International Journal of Technology in Education (IJTE), 6*(2), 310-325. https://doi.org/10.46328/ijte.40

Mulenga, E. M., & Marban, J. M. (2020). Is COVID-19 the gateway for digital learning in mathematics education? *Contemporary Educational Technology, 12*(2), ep269. https://doi.org/10.30935/cedtech/7949

Ndibalema, P. (2021). Online assessment in the era of digital natives in higher education institutions. *International*

Journal of Technology in Education (IJTE), 4(3), 443-463. https://doi.org/10.46328/ijte.89

OSCQR (2016). *SUNY Online Course Quality Review Rubric*. Open SUNY Online Teaching. Retrieved from https://oscqr.suny.edu/

Pangeni, S. (2017). Open and distance learning: cultural practices in Nepal. *European Journal of Open, Distance, and e-Learning, 19*(2).

Rapanta, C., Boturi, L., Goodyear, P., and Guardai, L. (2020). Online university teaching during and after the COVID-19 crisis: refocusing teacher presence and learning activity. *Postdigital Science and Education, 2*, 923-945. https://doi.org/10.1007/s42438-020-00155-y

Sartika, R.P. et al. (2020). The development of scaffolding-aided learning tools using the 5E learning cycle model. *Jurnal Pendidikan Indonesia (JPI)*, 9(3), e-ISSN: 2541-7207. DOI: 10.23887/jpi-undiksha.v9i3.15712

Shaharanee, I.N.M., Jamil, J.M., & Rodzi, S.S.M. (2016). The application of Google classroom as a tool for teaching and learning. *Journal of Telecommunication, Electronic and Computer Engineering, 8*(10).

Shanker, M., & Hu, M. (2008). *Improving teaching effectiveness using distance education tools.* IGI Global. Retrieved from http://personal.kent.edu/~mshanker/personal/Zip_ files/06.pdf

Siemens, G., Gasevic, D., & Dawson, S. (2015). *Preparing for the digital university: A review of the history and current state of distance, blended, and online learning*. Retrieved from http://linkresearchlab.org/PreparingDigitalUniversity.pdf

Simonson, M., & Seepersaud, D. J. (2019). *Distance education: definition & glossary of terms* (fourth edition). (pp. 1–3). Information Age Publishing.

Sintema, E. J. (2020). E-learning and smart revision portal for Zambian primary and secondary school learners: a digitalized virtual classroom in the COVID-19 era and beyond. *Aquademia, 4*(2), ep20017. https://doi.org/10.29333/aquademia/8253

Sun, A., & Chen, X. (2016). Online education and its effective practice: a research review. *Journal of Information Technology Education: Research, 15*, 157-190.

Toquero, C. M. (2020). Challenges and opportunities for higher education amid the covid-19 pandemic: The Philippine content. *Pedagogical Research, 5*(4). https://doi.org/10.29333/pr7947

Tria, J. Z. (2020). The COVID-19 pandemic through the lens of education in the Philippines: the new normal. *International Journal of Pedagogical Development and Lifelong Learning, 1*(1), ep20001. https://doi.org/10.30395/ijpdll/8311

Ukata, P. F., & Onuekwa, F. A. (2020). Application of ICT towards minimizing traditional classroom challenges of teaching and learning during COVID-19 pandemic in Rivers State Tertiary Institutions. *International Journal of Education and Evaluation, 6*(5).

UNESCO. (2020, December 5). *Education 2030: Incheon declaration and framework for action for the implementation of sustainable development goal 4- ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*. Retrieved from https://www.google.com.ph/url?sa=t&source=web&rct=j&url=https://uis.unesco.org/sites/default/files/documents/education/2030-icheon-framework-for-action-implementation-of-sdg4-2016-en_2.pdf

UNESCO. (2020, December 6). *Education in the time of COVID-19*. United Nations. Retrieved from https://www.google.com.ph/url?sa=t&source=web&rct=j&url=https://repositorio.cepal.org/bitstream/handle/11362/45905/1/S2000509_ed.pdf&ved=2ahUKEwibqMKJ7dvtAhXTPXAKHTo7AMg4ChAW

MAR6BAgEEAE&usg=AOvVaw0p7E9MJS8Hdqk7wQArW_Zb

Wilson, A. B. et al. (2018). *Breaking the tradition: a scoping meta-analysis analyzing the effects of student-centered learning and computer-aided instruction on students' performance in anatomy. American Association of Anatomists*. Anatomical Science Education: Wiley Online Library. https://doi.org/10.1002/ase.1789.

World Health Organization (2020). *Coronavirus disease (COVID-19) situation report 2*. Philippines March 11 2020. WHO, Representative office for the Philippines. (2020, November 24) https://www.who.int/docs/default-source/wpro---documents/countries/philippines/emergencies/covid-19/who-phl-sitrep-2-covid-19-11mar2020.pdf?sfvrsn=82d59fa2_2&download=true

Author Information

Mary Rose Briones

https://orcid.org/0000-0001-6376-6001

(corresponding author)

Samar State University (SSU)

Catbalogan City, Samar

Philippines

Contact e-mail:

mary_rose_mabini_briones@dlsu.edu.ph

Maricar Prudente

https://orcid.org/0000-0003-1156-0380

De La Salle University

Taft, Manila

Philippines

Denis Dyvee Errabo

https://orcid.org/0000-0002-4084-5142

De La Salle University

Taft, Manila

Philippines

Appendix A. The OSCQR Rubric

Note: The instrument in Google Form (where consent form is incorporated) can be viewed at this link: https://docs.google.com/forms/d/e/1FAIpQLSf60aoDhN1rytWNKg51nLqON288yg9UpYZvqf_lBwZZ7fy4Ew/viewform

Criteria	Rating			
	Not Acceptable (1)	**Acceptable (2)**	**Very Acceptable (3)**	**Highly Acceptable (4)**
I. Overview & Information				
1. The course includes Welcome and Getting Started Content				
2. An orientation or overview is provided for the course overall, as well as in each module. Learners know how to navigate and what tasks are due.				
3. Course includes a Course Information area that deconstructs the syllabus for learners in a clear and navigable way.				
4. A printable syllabus is available to learners (PDF, HTML).				
5. Course includes links to relevant policies on plagiarism, computer use, filing grievances, etc.				
6. Course provides access to learner success resources (technical help, orientation, tutoring).				
7. Course information states whether the course is fully online, blended, or web-enhanced.				
8. Appropriate methods and devices for accessing and participating in the course are communicated (mobile, publisher, websites, secure content, pop-ups, browser issue, microphone, webcam)				
9. Course objectives/outcomes are clearly defined, measurable, and aligned to learning activities, and assessments.				
10. Course Provides contact information for instructor/department/program.				
II. Technology and Tools				
11. Requisite skills for using technology tools (websites, software, and hardware) are				

clearly stated and supported with resources.	
12. Technical skills required for participation in course learning activities scaffold in a timely manner (orientation, practice, and application-where appropriate).	
13. Frequently used technology tools are easily accessed. Any tools not being utilized are removed from the course menu.	
14. Course includes links to privacy policies for technology tools.	
15. Any technology tools meet accessibility standards.	
III. Design and Layout	
16. A logical consistent and uncluttered layout is established. The course is easy to navigate (consistent color scheme and icon layout, related content organized together, self-evident titles)	
17. Large blocks of information are divided into manageable sections with ample white space around and between blocks.	
18. There is enough contrast between text and background for the content to be easily viewed.	
19. Instructions are provided and well written.	
20. Course is free of grammatical and spelling errors.	
21. Text is formatted with titles, headings, and other styles to enhance readability and improve the structure of the document.	
22. Flashing and blinking text are avoided.	
23. A sans-serif font with a standard size of at least 12 pt. is used.	
24. When possible, information is displayed in a linear format instead of a table.	
25. Tables are accompanied by a title and summary description (if any).	
26. Tables header rows and columns are assigned (if any).	

27. Slideshows use a predefined slide layout and include unique slide titles.	
28. For all slideshows, there are simple non-automatic transitions between slides.	
IV. Content and Activities	
29. Course offers access to a variety of resources that facilitate communication and collaboration. deliver content, and support learning and engagement.	
30. Course provides activities for learners to develop higher-order thinking and problem-solving skills, such as critical reflection and analysis.	
31. Course provides activities that emulate real-world applications of the discipline, such as experiential learning, case studies, and problem-based activities.	
32. Where available, Open Educational Resources, free, or low-cost materials are used.	
33. Course materials and resources include copyright and licensing, clearly stating permission to share where applicable.	
34. Text content is available in an easily accessed format, preferably HTML. All text content is readable by sensitive technology, including a PDF or any text contained in an image.	
35. A text equivalent for any non-text element is provided ("alt" tags, captions, transcripts, etc.)	
36. Text, graphics, and images are understandable when viewed without color. Text should be used as a primary method for delivering information.	
37. Hyperlinked text is descriptive and make sense when out of context (avoid using "click here").	
V. Interaction	
38. Expectations for timely and regular feedback from the instructor are clearly stated (questions, emails, assignments).	
39. Expectations for interaction are clearly stated (netiquette,	

grade weighting, models/examples, and timing and frequency of contributions).	
40. Learners have an opportunity to get to know the instructor.	
41. Course contains resources or activities intended to build a sense of class community, support open communication, and establish trust (at least one of the following- Icebreaker, Bulletin, Meet Your Classmates, Ask a Question discussion forums).	
42. Course offers opportunities for learner to learner interaction and constructive collaboration.	
43. Learners are encouraged to share resources and inject knowledge from diverse sources of information in their course interactions.	
VI. Assessment and Feedback	
44. Course grading policies, including consequences of late submissions, are clearly stated in the course information area or syllabus.	
45. Course includes frequent and appropriate methods to assess learner's mastery of content.	
46. Criteria for assessment of a graded assignment are clearly articulated (rubrics, exemplary work).	
47. Learners have opportunities to review their performance and assess their own learning throughout the course (pre-test, automated self-tests, reflective assignments, etc.).	
48. Learners are informed when timed response is required. Proper lead time is provided to ensure there is opportunity to prepare an accommodation.	
49. Learners have easy access to a well-designed and up-to-date gradebook.	
50. Learners have multiple opportunities to provide descriptive feedback on course design, course content, course experience, and ease of online technology.	

Appendix B. The Interface of OSCQR (can be viewed at https://oscqr.suny.edu/)