

NAVIGATING DIVERSITY: ANALYZING INSTRUCTORS' PERSPECTIVES ON IMPLEMENTING CULTURALLY RESPONSIVE PEDAGOGY IN ONLINE LEARNING ENVIRONMENTS

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Abstract

The rapid rise of different learners in online learning has made it essential for online educators to include multicultural resource curricula and instructional activities. This study sought to understand how educators view culturally responsive pedagogy in online learning, how they apply these approaches in the virtual classroom, and what challenges they encounter when supporting learners from different cultural backgrounds in cross-cultural collaborative learning. Using a qualitative multi-site case study technique, data were collected at 12 American colleges and universities in five academic disciplines: education, social sciences, engineering, physical sciences, and health sciences. A continual comparative analysis technique was used to gather and analyze the 60 in-depth, semi-structured interviews with the instructors (26 female and 34 male). The results demonstrated that the instructors used cross-cultural interactions and culturally responsive education to promote student involvement. The majority of the instructors addressed the impact of multicultural education in online learning, according to the findings, and included a variety of internationalized learning resources to satisfy different student needs. However, it was noted that physical science instructors encountered challenges when attempting to include culturally diverse content into their virtual courses. The study's findings spark debate on the optimal strategies for assisting

instructors in having productive online interactions with a diverse student body.

KEYWORDS: culturally responsive computing, online educators, diversity, online education, and culturally responsive pedagogy

1. INTRODUCTION

The growth of online learning in universities and colleges has seen a much higher trend in terms of diverse student populations (Allen & Seaman, 2018; Jung & Gunawardena, 2014). The increased growth rate of online learning can be attributed to academic leaders' strategic focus to move in-person classes to online/remote learning due to the disruptions caused by the COVID-19 pandemic, the rapid changes in technology as a means of instructional delivery in most universities, access and flexibility afforded by the online courses, rising tuition costs and an evolving workforce seeking lifelong learning options (Allen & Seaman, 2018; Altbach & de Wit, 2020). Furthermore, the growth of online learning has led to situations where both students and instructors are required to cross cultures to share new ideas, collaborate and build new knowledge. Several studies (eg, Kumi-Yeboah, Dogbey, Yuan & Smith, 2020; Petersen, 2015; Yang et al., 2010) have called on instructors to design online education environments that promote cultural inclusivity. These studies found that online instructors must acknowledge students' cultural

experiences, and dimensions that are specific to learning (ie, learning styles, language abilities and past educational experiences in online learning environments). This lack of knowledge has increasingly been reflected in such critical moments where the COVID-19 pandemic has compelled most colleges and universities to embrace online education in the United States and the world at large (Altbach & De Wit, 2020). Consequently, 91% of higher education institutions' in-person teaching has been replaced by remote activities (Marinoni et al., 2020). Critical in this area of online education is the instructor's role in designing instructional strategies to harness diverse students' cultural and social experiences and how these experiences can be used in online classrooms to enhance the academic success of diverse student populations (Baker, 2020; DePietro, 2020; Govindarajan & Srivastava, 2020; Jørgensen et al., 2020). Another critical area involves maintaining awareness of inequities faced by students and the implications for their academic success in online education (Czeriewicz et al., 2019).

There is, however, a dearth of studies on online instructors' perceptions of culturally responsive pedagogy (CRP), specifically with regard to the design, preparation and integration of multicultural learning contents in online education (Gómez-Rey et al., 2016; Hsieh, 2010; Jørgensen et al., 2020; Mittelmeier et al., 2018). This dearth has obscured understandings of how instructors employ CRP strategies in online education to provide a scaffold in online discourse construction and offer opportunities for students to take advantage of the content knowledge as is mostly experienced in face-to-face (F2F) classroom settings (Jørgensen et al., 2020; Mittelmeier et al., 2018; O'Connor et al., 2015). Besides, it is critical for instructors

to incorporate in their online courses, CRP as an instructional change to the online classroom by 'creating an environment that acknowledges, celebrates, and builds upon the cultural capital that learners and teachers bring to the online classroom' (Woodley et al., 2017, p. 470).

This research contributes to the instructors' (we define instructors as faculty who teach online courses) understanding of CRP principles in online spaces that recognize global identities and cultural experiences to meet the needs of diverse students in online learning environments. Furthermore, this research contributes to the context, resources, design and implementation of incorporating diverse materials and culturally responsive pedagogies in the design of future online courses in higher education institutions and fosters pedagogical dialogue and critical reflection in online classrooms (Hodges et al., 2020; Jørgensen et al., 2020; Oliveira et al., 2021). Framed by the culturally responsive computing theory (CRC) (Scott et al., 2015), we aimed to explore instructors' perceptions of CRP in online education, how instructors integrate CRP into online curriculum and the challenges in incorporating cross-cultural collaborative learning for students from different cultural backgrounds.

2. LITERATURE REVIEW

Culturally responsive teaching in online education

According to Gay (2010), culturally responsive teaching (CRT) is significant to teaching and learning for students from diverse backgrounds as it (a) acknowledges the legitimacy of the cultural heritage of different ethnic groups, both as legacies that affect students' dispositions, attitudes and approaches to learning and worthy content to be taught in

the formal curriculum; (b) builds bridges of meaningfulness between home and school experiences of and between academic abstractions and lived sociocultural realities; (c) uses a wide variety of instructional strategies that are connected to different learning styles; (d) teaches students to know and praise their own and other's cultural heritages; and (e) incorporates multicultural information, resources, and materials in all the subjects and skills routinely taught in schools. However, a significant body of literature on CRP focuses on F2F teaching environments which means there is less information on how instructors can incorporate CRP into online curriculum and as a pedagogical practice to provide support for diverse online learners (Thomas & Warren, 2017; Woodley et al., 2017; Zhang, 2013).

Aronson and Laughter (2016) pointed out that in the practice of culturally responsive education, culturally relevant educators use constructivist methods to develop bridges that connect students' cultural frames to academic knowledge. Culturally responsive education builds on the cultural experiences that diverse students bring to the online learning environment. This type of education includes engaging students in critical reflections about their own life experiences and backgrounds, using varied curricula and activities to support diverse students, encouraging students to learn from their own and peers' cultures, taking pride in their cultural backgrounds, and working to promote social justice for all students in the educational system (Gay, 2010; Jørgensen et al., 2020). Though the available literature broadly examines CRT/pedagogy elements of online education, there is a lack of instructors' perceptions on the phenomenon as well as the challenges that impinge the promotion of multicultural content in the online

classroom (Altbach & De Wit, 2020; Ke & Kwak, 2013). A related study on the phenomenon by Jørgensen et al. (2020) highlighted the wrong notion by many that shifting diverse students online automatically makes them acquire intercultural learning. Thus, the dire need to intentionally promote critical interculturality among such learners.

Moreover, Gómez-Rey et al. (2016) examined students' satisfaction in online education using the six-dimensional Hofstede cultural model through multiple correspondence analysis and cluster analysis based on data from students' pre-/post-survey responses across four universities in different countries. Results from their study showed that students with high uncertainty avoidance levels (eg, the United States) were comfortable in a structured learning process, while those from countries with lower uncertainty avoidance levels (eg, Russia and Mexico) were comfortable in an open-minded learning environment. The authors recommended the need for online instructors to recognize cultural differences among international students to facilitate the learning experiences of diverse students in online education. Other studies (eg, Jørgensen et al., 2020; Mittelmeier et al., 2018) found that sociocultural factors such as cultural background and social network circles influence participation when students worked online with peers from other countries. The researchers recommended developing culturally responsive inclusive activities to support diverse students in online education. To address this gap in the literature, this study offers the opportunity for online instructors to describe their viewpoints of CRP and the challenges they encounter to enhance CRT in online education. Gaining such clarity positions universities worldwide to better address

cultural diversity and equity in online education, which is exacerbated by assumptions that online learning inadvertently and equitably meets the needs of all students.

Culturally responsive computing theory

Culturally responsive computing theory is an instructional strategy constructed to engage culturally and linguistically diverse youth (eg, African Americans, Latinos, Native Americans, English language learners) and dwells on the assumption that all students can succeed, make curriculum meaningful and relevant, and connect knowledge and learning to students' strengths, interests and prior experiences (Ladson-Billings, 1995; Scott et al., 2015)

Also, the CRC is seen as an approach for devising technological support and computer education programs informed by the extensive work in the CRT (Gay, 2010; Ladson-Billings, 2000). Based on the tenets of the CRC, students from underrepresented groups are engaged through culturally responsive examples of computing and a clear social purpose to computing with real-world applications (Jørgensen et al., 2020; Scott et al., 2009, 2011; Scott & White, 2013). CRC is categorized into five tenets: (1) all students are capable of digital innovation; (2) the learning context supports transformational use of technology; (3) learning about oneself along various intersecting sociocultural lines allows for technical innovation; (4) technology should be a vehicle by which students reflect and demonstrate understanding of their intersectional identities; and (5) barometers for technological success should consider who creates, for whom and to what ends rather than who endures a socially and culturally irrelevant curriculum. The CRC theory advocates that both instructors and students must

collaborate to reflect on the intersection of their previous experiences and identities within technology environments, discover and create the assets of individual, and create connections with participants within and outside communities.

Despite the proposition of CRC as a tool for enhancing cultural responsiveness in online learning, it is not sufficiently clear how instructors manage the elements included therein or how they might be supported to leverage technological tools for the benefit of students from varied backgrounds. From the preceding, CRC pedagogy is an instructional practice designed to engage diverse students to succeed, considering the rapid growth of student population in online spaces and the need for instructors to structure online courses that meet the needs of all students. CRC thus brings a suitable theoretical framework to structure this research.

Research questions

The following three research questions guided the study: 1. In what ways do instructors describe their perception of CRP in online education? 2. In what ways do instructors describe the use of CRP to support students' intercultural collaborations, engagement and academic achievements in online education? 3. What challenges and/or barriers do instructors encounter as they attempt to incorporate CRP in online education?

3. METHODS

This study adopted the qualitative case study method to explore diversity and inclusion in online learning of instructors from 12 colleges and universities in the United States. The adoption of this method is due to the scarcity of existing knowledge on the phenomenon of interest in this study (Creswell & Creswell, 2020; Mills et al., 2010). That is, incorporating

CRP in online learning. To understand instructors' perceptions of CRP in online education in this study, how they integrate CRP pedagogies into online curriculum, and their challenges in incorporating diverse/inclusive and collaborative learning resources for students, a qualitative study based on semi-structured in-depth interviews were conducted. Within the qualitative approach, the goal of research is to 'rely as much as possible on the participants' views of the situation' (Creswell, 2013, p. 24).

Sample

A total of 60 instructors from (12) universities and colleges in the State University of New York (SUNY) in the Northeastern part of the United States participated in this study. The participants were Full-Time instructors, consisting of 21 Assistant Professors in tenure-track positions, and six Clinical Professors of Practice in professional tenure-track positions. Participants also included 19 Associate Professors and 14 tenured full Professors. There were 26 females and 34 males from different cultures and academic disciplines, including Education (n = 14), Social Sciences (n = 16), Engineering (n = 10), Physical Sciences (n = 8) and Health Sciences (n = 12). Participants' cultural backgrounds consisted of Africa Americans (n = 8), Caucasian [Whites] (n = 21), Hispanics (n = 9) Asian (n = 18) and others (n = 4) (see Appendix A—Table A1 for participants demographic information). Participants were recruited based on their experiences in planning, organizing, teaching and designing online courses with diverse curriculum/learning content. All participants had taught at least two online/blended courses for a minimum of 2years at the university/college level. In the case of those who had taught in the

blended mode, only their online experiences were germane to this study.

Data collection

After securing Institutional Review Board approval, we contacted 20 universities and colleges that offer online degree programs regarding the purpose of the study and assured selected instructors of their confidentiality and identity. Data were collected from 20th February 2019 to 30th January 2020. A total of 12 out of the 20 universities contacted agreed to our request and provided a list of all their instructors who teach online courses and their contact information. We then emailed all participants about the objectives of the study. Overall, 60 participants (instructors) from five academic disciplines (Education, Social Sciences, Engineering, Physical Sciences and Health Sciences) in 12 colleges agreed to participate in the research.

Semi-structured interviews lasting between 40 and 60minutes were conducted with all 60 instructors individually (Creswell, 2013). The research questions and the CRC framework guided the construction of the initial set of interview questions which were sent to four experts in the field of multicultural education and diversity, online education and instructional technology for review. The suggestions received from these experts guided our revision and the selection of the final set of interview questions for the study. The interviews took place on 12 campuses at the offices of the respective online instructors. Each interview was audio-recorded, transcribed and coded using the qualitative method. Pseudonyms were used for the participants to protect their identities and for purposes of confidentiality (Miles & Saldana, 2014). Details regarding interview questions are shown in Appendix B.

Data analysis

The constant comparative analysis method using ‘open’, ‘axial’ and ‘selective’ coding strategies was employed to analyse the data (Strauss & Corbin, 1998). Though the constant

comparative analysis was originally created for grounded theory, it is not restricted to this theory any longer as it has consistently been applied for exploring and analysing data within the various qualitative designs (Turner, 2022). To ensure consistency and dependability of the qualitative study, and to guard against research bias, we listened to the audio-recordings severally to ensure it was consistent with the transcriptions. We also used the code–recode strategy and peer examination (Remler & Van Ryzin, 2011). The first author of this study performed the first level of coding through open coding in collaboration with the second author and identified themes and patterns by breaking up the data sets into separate categories using constant comparative analysis with data transcripts to locate patterns for each interview and instructional activities in online classrooms. The analysis led to the following initial categories: ‘cultures and knowledge construction in online space’, ‘background experiences’, ‘previous content knowledge’, ‘how students bring past educational experiences to online class’, ‘knowledge as a resource’, ‘use of artifacts and visuals’ and ‘lack of experience learning English as a Second Language learner’. This process also involved comparing new coded data with pre-existing codes to promote consistency and achieve accurate codes (Miles & Huberman, 1994). Second, we used axial coding to assemble data to reflect instructors' perceptions of culturally responsive/pedagogy and instructional practices they used to equip students to

succeed in online education. The following categories emerged: ‘online discussion and engagements’, ‘learning engagement’, ‘questions to reflect and share’, ‘group interaction and constant communications’, ‘quick feedback to students questions’ and ‘reflective essays’, ‘incorporate into my lessons’, ‘designing inclusive curriculum’, ‘films and videos of different/diverse populations/groups’, ‘use books’, ‘articles’, and ‘other resources’, ‘communications’, ‘providing accommodations to meet needs of all students’, and ‘issues with language and design of diverse curriculum’. Third, selective coding was used to re-examine the data and address any discrepancies in the data. We compared and examined data, revised categories and deleted categories that were not important—to help establish the final themes. The last stage of this process is the copious use of ‘memos’ (‘code’, ‘theoretical’ and ‘operational notes’) that served to conceptualize raw data throughout the coding process (Strauss & Corbin, 1998). In the end, five themes emerged from the analysed data. These are ‘using students' personal and cultural experiences to build content knowledge’ which appeared 78 times in the data. Next was ‘interactions to facilitate students' academic engagements’ with roughly 80 appearances. The next theme to emerge was ‘incorporating CRT’ with 72 occurrences. The last two themes were ‘integrating diverse and use of international learning content’ and ‘challenges of designing and incorporating CRP in online learning’ with 84 and 76 occurrences, respectively. We then re-examined all data to check for discrepancies to build on the trustworthiness of the data. A draft version of the interview transcripts and the findings were sent to participants as a form of member-check to authenticate the

accuracy of the emerging themes. We corroborated three data sources (ie, interview transcripts, reviewer's comments and field notes) to confirm themes that emerged from the data (Merriam, 2009). See Appendix C for Table on data chats/codes, representative quotations and themes.

4. RESULTS

This study was set out to mainly explore instructors' perceptions of CRP in online education. The study was guided by three research questions and underpinned by Scott et al.'s (2015) CRC theory. After analysing the field data, five themes were distilled are presented in the following. The presentation of the study results is situated mainly in the context of Scott et al.'s (2015) CRC theory. Also, anecdotes from the respondents are presented to support our arguments. This style of presentation is useful in providing theoretical context and focus for the study rather than merely presenting the results emanating from the analysis of the field data.

Using students' personal and cultural experiences to build content knowledge

In the online learning environment, both students and instructors bring their cultural and social backgrounds which influence the construction of knowledge in that learning space and setting. A recurring theme across the interviews was instructors' ability to tap into students' personal and past educational experiences to engage students to participate in online discussions. This is evidenced in the following statement:

The best strategy to use CRP in online learning is to tap into students' cultural knowledge and educational experiences they bring to online classrooms. I use inquiry-based learning activities that allow

students to express their thoughts, feelings, and experiences in creating new knowledge and information. (Education faculty, about CRP in online education)

Gay (2010) defines CRT as 'using the cultural knowledge, prior experience, frame of reference, and performance styles of ethnically diverse students to make learning encounters more relevant to and effective for them' (p. 13). All the instructors in this study understood the need to design online classes to bridge the geographic and cultural backgrounds to give students the chance to share their thoughts and understanding of the concept or subject matter.

I think it is important to connect teaching materials to students' cultural background via comprehensive instructional approaches to teaching and learning that uses the contexts and contents for the cultures and lived experiences of students from diverse backgrounds. (Health Sciences faculty, about CRP in online education).

Moreover, instructors must tap into the cultural knowledge, experiences, contributions and perspectives of students as well as scaffold instruction that builds bridges between cultural experiences of diverse students and curriculum contents to promote higher academic performance (Jørgensen et al., 2020). An instructor in the social sciences noted: 'To promote effective online teaching that meets the needs of all students, I use books, articles, films, music, audio recordings and varied teaching resources to explain and visualize examples of diverse learners and communication'. The preceding aligns with Dover's (2013) statement that culturally responsive educators use constructivist methods to develop bridges to connect students' cultural references to academic skills and concepts. Instructors

agreed with the above statements and articulated that ‘tapping into students’ experiences helped them to connect to teaching materials and concepts in their online learning space

Another instructor in education stated: ‘As a professor of teacher education, I design online courses that tap into students’ cultural and past educational experiences to help them connect to the information or say the learning contents’. This instructor reflected her awareness of using students’ cultural knowledge as a resource to facilitate students’ engagement and participation in the online discussion forums.

Interactions to facilitate students’ academic engagement

All the instructors recognized the importance of communication with students in online learning. For example, they communicated with students via weekly announcements to remind them of upcoming topics, group work formation, due dates and modifications that they may make to the course. For instance, an Instructor shared the following statement as an important way to keep students progressing toward course goals and expectations.

Communication with students is very important to me because sometimes with written academic language at the graduate level, some of them struggle. Especially if they are international students and are not too well informed about what is conventional language and what they should be using. I find it important to inform them about that in the beginning, so that there's no miscommunication or misunderstanding which may become a bigger problem later. (Engineering faculty, about interactions in online learning).

Furthermore, all the instructors indicated the use of digital tools in the Learning/Course Management Systems to create space for students to have consistent communications. They maintained consistent communication and provided feedback to students’ questions in the discussion posts. This highlights the instructors’ awareness of how cultural differences can affect how they communicate (Kim & Park, 2015). Multiple instructors reported creating avenues to establish consistent communication avenues and feedback to students’ questions to enhance intercultural interaction in online learning. Their views are summed up in one instructor’s explanation,

Studies have shown that differences in the communication styles of learners from different cultures have been reported in varying contexts (Yang et al., 2010). Hence, instructors must incorporate strategies that demonstrate interpersonal understanding, and social networking diversity to help students exchange ideas and experiences with each other (Mittelmeier et al., 2018).

Incorporating culturally responsive teaching

Gay (2010) asserts that teachers need to understand that culture and differences are important ideologies for CRT. In that regard, about 50 of the instructors acknowledged that online teaching may focus on social, teaching and cognitive presence to connect with the cultural, social and educational backgrounds of students (Garrison et al., 2000). For instance, one instructor stated:

Furthermore, almost all the instructors emphasized that the inclusion of CRP in the online curriculum helps to create accommodation and caring for student

engagement and participation in an online discussion to achieve higher academic performance. For example, one instructor in engineering noted: ‘Using CRP in my class helps students to do critical dialogue to connect readings to everyday life experiences’. For 90% of the instructors, “CRP in online education allows them to engage students to do critical reflection to understand how cultural and social experiences shape their understanding of the concepts learned.” The interviews revealed that instructors in health sciences, social sciences and education provided students with cultural awareness activity and shared their cultural backgrounds in the early state of the online course. The aim was to provide students opportunities to share their cultural backgrounds with instructors and peers which Jørgensen et al. (2020) believe is the beginning of trusting relationships and to get to know each other's background. An instructor in health sciences illustrated: ‘I have students from different cultural backgrounds, so I respect and honor their cultures, preferences, and opinions. I also let all students practice same to foster effective cross-cultural collaborative learning’. Another instructor added a similar view in the following,

I'm a White male and teach online classes in African American studies. I am cognizant of my attitudes, beliefs, and expectations about different cultural groups [students], so I design instructional strategies that enable students to connect to the learning contents. I use learning activities—cultural awareness activity in the first week that allows students to get to know each other's background and experiences they bring to the online classroom. I believe this promotes CRT in my class. (Social Sciences faculty, about Incorporating CRT)

According to Freire (1998), instructors must create learning environments where students develop voices and perspectives and are allowed to participate (fully) in the multiple discourses available in a learning context. Freire (1998) identifies that the preceding will elevate students from being information consumers to people who are capable of constructing and deconstructing information. Again, recognizing the multiple cultures students bring to the online environment helps instructors to design conducive learning environments that foster students' engagement and critical dialogue that work to connect course contents relatable to their life experiences. Consequently, it is in the right direction that Gómez-Rey et al. (2016) call for instructors to be aware of the advantages of cultural factors in online education and the need to design culturally relevant instruction that is relatable to the needs of diverse online learners.

As an instructor, sometimes you get into the occasion that you see some posts that are not culturally very acceptable, so I think at that time, it's best to isolate and insulate those aspects. Again, it is also important to address issues of sensitivity in my online classes to help students, especially diverse learners. I create a conducive online space that allows students to share their personal experiences and address misunderstandings in the discussion forum. (Physical Sciences faculty, about multicultural education)

The instructors cited above showed in-depth understanding of the relevance of multiculturalism in online education to help them design instructional activities to meet the learning needs of all students. As noted by Bennett (2001), multiculturalism in online learning provides the chance for instructors to recognize the importance of

classroom climate, satisfaction, social interaction, motivation, and issues of culture and language communication.

Integrating diverse and use of internationalized learning contents

Interviews indicated that all instructors agreed on the need to design instructional online learning with a focus on integrated global online learning environments to include multiple cultures and contents that share with the cultures and experiences of students. Examples of incorporating films to promote global curriculum in online courses are Frontline: Ghosts of Rwanda that featured interviews and personal reflections to teach genocide. In the light of the foregoing, an instructor in education remarked:

I integrate global contents in my online course to facilitate intercultural interactions in the discussion forums. I believe this will provide opportunities for international students to share ideas and perspectives on topics based on their cultural and past experiences. Inclusion of global or international contents provides opportunities for students to do collaborative activities via sharing of new ideas from their peers and instructors. Global content promotes critical thinking and dialogue for students in online learning. (Education faculty, diverse learning contents)

For this instructor, incorporating global themes or international curricula into the learning resources and academic assignments for students promote collaborations, increases engagement between students and promotes critical thinking and dialogue in online learning (Jørgensen et al., 2020). An instructor in social sciences also recalled: 'I engage students via instructional activities that comprise global contents like globally

related contents documentaries and films such as 'Taking Root: The Vision of Wangari Maathai' and the 'The Rising Girls' and articles 'Taking on the Taboos That Keep Women Out of India's Workforce' to help students connect to the learning materials and co-construct new knowledge'. Similarly, an instructor shared:

I teach environmental sciences and often use global contents materials to help students get different perspectives on how environmental challenges are solved in other countries—they serve as agents to facilitate cross-cultural collaborations and diverse contributions to build new ideas. (Physical Sciences faculty, diverse learning contents)

On a similar note, an instructor in engineering noted:

To meet the needs of international students and a better understanding of individual cultural differences in my online class, I use diverse cultural contexts by creating an online classroom environment that accommodate, celebrates, and builds upon the cultural capital that students bring to the virtual space. (Engineering faculty, diverse learning environment)

Challenges of designing and incorporating culturally responsive pedagogy in online learning

All instructors in this study described the challenges they faced in designing online learning content to address cultural inclusion in online education. The key challenges related to language and cultural differences, as well as lack of pedagogical skills to present certain content in online classrooms. For instance, an instructor stated:

Instructor's statement above demonstrates the challenges they faced in their effort to

incorporate multicultural content into course materials and facilitate cross-cultural collaborations in online learning. Another challenge instructors faced was their inability to identify students and categorize them based on ethnicity or race within the online environment. Data from this study revealed that instructors, particularly those in the sciences, lacked the skills or awareness of students' cultural differences or experiences to design instructional activities that meet their needs in online learning. Furthermore, they reported having less knowledge and experience in designing culturally relevant pedagogy with a focus on multicultural content to address the learning needs and learning satisfaction of all students.

I have international students who tend to be silent most of the time in discussions while American students tend to be more proactive or active in discussions. They explained that in their culture, when somebody is talking, you listen attentively, and more so when it is the instructor. I had to explain to them that in the U.S. educational system, they have to be proactive in their communication. I believe this aspect of their culture probably restricted them from participating as actively as some American students. (Biology faculty, challenges)

Another instructor from physical science commented: I teach students how to do statistical programming. And for statistical programming, the language itself is a problem, you know, if the student just doesn't understand the language itself, it will be a problem. Other than the language, I feel like it's difficult to design content using culturally responsive teaching to fit with highly technical fields like programming it is difficult as you know... I mean cultural issues really don't

come up that frequently in highly technical fields.

Instructors explained that they lacked the requisite pedagogical skills to design an inclusive instructional activity to help diverse students succeed in online learning as compared to what they can do in F2F learning environments. Overall, instructors in the physical sciences revealed that designing culturally inclusive instructional activities to meet the needs of students in online learning environments is extremely challenging. This corroborates an assertion by Altbach and De Wit (2020) that, unlike the humanities, several laboratory-based courses in the sciences are difficult to be designed for online learning environments as students need to conduct experiments and have the physical and natural feeling of the laboratories.

5. DISCUSSION

This study aimed to explore the perceptions of 60 instructors from 12 colleges and universities on CRP in online education. This study adopted Scott's CRC theory (Scott et al., 2015) to support data collection, data analysis and the discussion of the results. The findings of this study revealed that instructors, particularly, those in education, engineering, health, and social sciences recognized the varied cultural experiences students bring to the online classrooms based on which they developed content that connect to students' experiences and cultural backgrounds. These instructors recognized the cultural experiences students bring to the online classroom as multicultural resources and cultural capital that they could tap into to design dimensional practice to help diverse learners succeed in online education (Du et al., 2015). Instructors used instructional strategies such as collaborative learning activities to help students engage in online discussions and interactions about course

contents with the purpose of becoming active participants in the construction of new knowledge.

Another important finding of this study was that instructors used diverse resources to facilitate students' interactions, preferences and understanding of the course content to help the students succeed in online learning. These included varied reading content, global content and culturally relevant resources to improve the impact of multicultural education in online learning environments. Furthermore, instructors particularly those in education, engineering, health and social sciences used globally related content and readings such as books, articles, audios and films to help diverse students, particularly, international students to connect to course content (Goodfellow & Lamy, 2009; Jørgensen et al., 2020). Instructors indicated that the inclusion of global reading materials/resources and examples provided opportunities for diverse students to contribute to the construction of new knowledge as well as become active learners in online classrooms and connect to the learning materials and contents in online education. Such strategies conform with the CRC theory as the incorporation of diverse content brings more meaning to the curriculum and eventually builds a community of online students (Arkoudis et al., 2013; Jørgensen et al., 2020; Scott et al., 2015).

Another interesting finding from this study was that the instructors used cross-cultural interactions as pedagogical practices to facilitate students' engagement and participation to help students attain academic achievement in online education. According to instructors using cross-cultural interactions empowered diverse students to interact with both peers and

instructors from different socio-cultural backgrounds in online classrooms. This activity helped students contribute to the co-construction of new knowledge via consistent dialogue and sharing of ideas from different perspectives (Scott et al., 2015). Liu et al. (2010) recommended that instructors must incorporate learning activities that 'accommodate different cultural pedagogy' and 'appreciate cultural differences' (p. 182), co-construction, and negotiation with peers (Baker & Taylor, 2012; Schreiber & Valle, 2013), and improve internalization of knowledge with the opportunity to examine personal views, respond to the multiple and challenging views of colleagues, and negotiate shared understandings (Schreiber & Valle, 2013).

On the other hand, interview results showed that instructors in physical sciences lacked the requisite knowledge and skills to develop multicultural instructional activities to promote collaborations for diverse learners in science-related online courses. These findings suggest the need for online instructors, especially, those in the physical sciences to be equipped with the needed skills and knowledge through continuous professional development efforts so they can incorporate multicultural content into their online courses to promote equitable access, participation and achievement of diverse students (eg, Altbach & De Wit, 2020; Ke & Kwak, 2013; Scott et al., 2015; Shadieff & Huang, 2016). It must, however, be noted that while the incorporation of varied instructional strategies and multicultural curricula may be essential in meeting the learning needs of diverse learners, it alone cannot overcome the sociocultural challenges encountered by them in online education. Hence, there is the need to look at their challenges holistically to provide integrated and

bespoke solutions so they can enjoy meaningful online education irrespective of their diversity.

6. CONCLUSION

The purpose of the research was to investigate how 60 online teachers felt about CRP and its application to online learning in order to increase student engagement and academic achievement. It also looked at the difficulties teachers had in integrating varied learning materials and CRP into their online instruction. It is evident that each teacher used CRT, integrated different and internationalized learning materials, and utilized cross-cultural contacts to encourage student participation in order to address the effects of multicultural education. The instructors encountered difficulties while attempting to help diverse students in online education by using CRP techniques. Additionally, instructors were able to accommodate the cultural differences among students in the online learning environment by designing and incorporating multicultural content through collaborative learning activities. This allowed instructors to better meet the needs of students with varying backgrounds in terms of instruction. The situation involving the physical science lecturers, however, was distinct. Their lack of expertise and abilities in developing multicultural instructional activities and the laboratory-based character of their subject areas prevented them from fostering partnerships among heterogeneous learners. In light of the results and the significance of CRC theory for online learning, other educators need to be aware of the need of include multicultural resources in their online courses in order to support a varied student body. The CRC theory, which is based on the premise that all students can succeed if

teachers make their curriculum meaningful and relevant and connect knowledge and learning to students' strengths, interests, and prior experiences, is supported by the researchers. It postulates an instructional strategy designed to engage culturally and linguistically diverse youth (Gay, 2010; Ladson-Billings, 2000; Scott et al., 2015). While not directly derived from the study's findings, we argue that combining the recommendations with policy directives and giving online instructors and their diverse student bodies the necessary technological support and training will enable the latter to have more fulfilling online learning experiences.

7. LIMITATIONS

This study is not without limitations as the results could be more impactful if a larger sample size was involved, and/or if additional studies on instructors' perspectives regarding these issues are conducted via quantitative or mixed methods. Furthermore, the study primarily focused on online instructors' perspectives in four academic programs via qualitative methods and did not seek the perspectives of instructors from other programs, or from instructional designers about the concept of CRP and instructional practices incorporated to facilitate diverse students' academic performance in online learning. Finally, the study did not include the perspectives of instructional designers, who constitute a significant part in the design of online courses, on the best instructional practices that facilitate students' engagement in online learning environments. Lastly, a study of the students' backgrounds could have contributed to understanding their challenges but the present study could not capture that. In this light, we do not anticipate the findings from this study to be generalized to diverse online learners in

contexts outside the setting of this study. However, this study serves as a reference source to provide other online instructors who teach students with diverse backgrounds to be more effective in how they handle and teach such students. Besides, diverse online learners stand to benefit from the recommendations of this study to prepare and go through their online education with much ease.

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