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# Increasing pre-service teachers' multicultural sensitivity through online learning

Shelanee Theresa P. Ruales<sup>1,2</sup>  · Wim Van Petegem<sup>3</sup> ·  
Josefina M. Tabudlong<sup>4</sup> · Orhan Agirdag<sup>1,5</sup>

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## Abstract

The role of pre-service teacher education is crucial in culturally diverse contexts where conflict exists. Thus, this study examined whether pre-service teachers' multicultural sensitivity can be increased through a Transformative Learning Theory-based online course. The developed course underwent expert evaluation and pilot-testing before its implementation. T-test comparisons of pre- and post-tests with 97 Filipino pre-service teachers show a statistically significant increase in overall multicultural sensitivity. While the effect size is modest based on Cohen's *d*, 84.5% of the pre-service teachers claimed to have experienced positive change. All pre-service teachers who claimed to have experienced positive change identified the individual reflection activities to have influenced their change. This study can be replicated in other contexts. The course design can be adopted, but some of the course content has to be contextualized. The findings of this study can inform both theory and practice on how multicultural sensitivity can be increased and how Transformative Learning Theory can be applied in online course design.

**Keywords** Multicultural sensitivity · Online learning · Pre-service teachers · Transformative learning theory · Teacher education

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✉ Shelanee Theresa P. Ruales  
shelaneetheresa@gmail.com

Wim Van Petegem  
wim.vanpetegem@kuleuven.be

Josefina M. Tabudlong  
josefina.tabudlong@g.msuiit.edu.ph

Orhan Agirdag  
orhan.agirdag@gmail.com

Extended author information available on the last page of the article

## 1 Introduction

Education can transform societies - such as change attitudes, behaviors, and the relations between groups who had to live with conflict (UNICEF 2011). According to UNICEF, since education can either aggravate or reduce conflict, more attention should be given to reforms under the education sector and how these can contribute to social transformation. “In conflict-affected situations, education is more than service delivery because it is a means of socialization and identity development through the transmission of knowledge, skills, values, and attitudes across generations” (Smith 2010, p. 1). Hence, in places experiencing conflict such as the context of this study, education is an essential means to promote an appreciation for cultural diversity and respect for cultural differences to help reduce conflict and foster peaceful coexistence.

Teachers are known as agents of change. Literature has emphasized that teachers play a significant role in helping students become open and accepting of diversity (Van Driel et al. 2016). Pre-service teacher education is crucial since it plays a pivotal role in the success of an educational system (Barrett et al. 2007; World Bank 2012). Therefore, pre-service teacher education should focus not only on content knowledge and methodological competencies but also on values and attitudes that are needed for teaching in diverse classrooms.

Various studies show that pre-service teachers are not adequately prepared to teach culturally diverse students (e.g., Chiu et al. 2017; Lambeth and Smith 2016; Magogwe and Ketsitlile 2015; Skepple 2015). Since cultural diversity calls the need for teachers who can deal with differences, teacher education should foster multicultural sensitivity (MS). MS is an individual’s awareness of cultural differences, being able to respect these differences and respond to it appropriately. As Hughes and Hood (2007) said, this sensitivity is focused on the affective elements which are important in appreciating differences and is considered a foundation in the development of cultural competence. However, there is no exact blueprint on how it can be developed despite that in all aspects of education, concepts of culture and intercultural interaction permeate (Cushner and Mahon 2009).

The use of online learning provides particular opportunities to explore whether computer-mediated learning helps in increasing MS. Since it facilitates computer-mediated communication, interpersonal relation stress is lower and psychological burden is avoided, especially when the topic is sensitive in nature (Mei-Chiung et al. 2015). Asynchronous channels allow the learners to think and reflect before posting anything online (Curtis & Lawson, 2001 in Kelly and Papadopoulos 2009; Kruger et al. 2005). An online learning environment enables students to tackle sensitive issues, such as prejudice and discrimination, that are often inhibited in a face-to-face situation (Merryfield 2003). It can also create more confidence among the students to share their thoughts since everyone has the same opportunity to share their ideas (Kelly and Papadopoulos 2009) and can promote critical thinking since students have more time to study the content posted (Bullen 1998; Ziegahn 2001). Additionally, in places with a fragile security situation, online learning can be an alternative to classroom learning. Almost 92% of the online and distance education studies in [Nosignificantdifference.org](http://Nosignificantdifference.org) show that compared to traditional education, online and distance education is as effective, if not better (Nguyen 2015). Various aid groups (e.g., MBZ Foundation, Norwegian Agency for Development Cooperation, Sawa for

Development and Aid) saw the potential of online learning in conflict zones that they released funds for such purpose (Gordon 2016). Though several studies report on the positive effects of multicultural education courses to pre-service teachers' multicultural attitudes and views (e.g., Nadelson et al. 2012; Edwards & Kuhlman, 2007 and Wiggins, Follo, & Eberly, 2007 in Schoorman and Bogotch 2010), published studies on the use of media and technology in teaching multicultural content and skills are limited. In terms of MS courses, a search online will yield courses that are intended for individuals working in the business and health sectors.

Thus, this study aims to determine whether pre-service teachers' MS can be increased through an online course. An online course is developed for this purpose and the newly designed course will be evaluated and tested. Due to the absence of a blueprint in increasing MS, the concept of Transformative Learning Theory (TLT) is deemed helpful in the course development since TLT's premise focuses on change, which is the aim of the course.

## 2 The context

This study is conducted in Mindanao which is one of the three main groups of islands in the Philippines. The Philippines is home to 182 ethnolinguistic groups (Reyes et al. 2017). Mindanao is considered the most diverse and is known for its tri-people - the Moro or Muslims, Indigenous Peoples (IPs) or the Lumad, and the Christians. The existence of these diverse groups has led to the inevitable issue of conflict on the island. Different reasons were cited for having caused the conflict, but what is clear is that the repercussions of the conflict are social, psychological, and cultural (Lara Jr. and Champain 2009). These influenced the mindsets of people which have led to biases and attitudes of discrimination. With the complex nature of the Mindanao conflict (Adam et al. 2014; Hincks 2017), prejudice and lack of knowledge and MS have played a role in the development of animosities among the tri-people.

In the context of Mindanao, it is crucial that future teachers are prepared to work with culturally diverse students. While the Philippine government is pursuing teacher quality reforms, it is difficult to tell whether the courses prescribed for pre-service teacher training fosters MS. Literature is sparse when it comes to Philippine research on topics related to multiculturalism and cultural diversity. Thus, this study will not only help address the need to increase pre-service teachers' MS but also stimulate academic discourse on issues related to multiculturalism and multicultural education.

### 2.1 Transformative learning theory and its application in online learning

In this study, the Transformative Learning Theory by Jack Mezirow is used as a theoretical framework that guides the design and development of the online course due to its suitability in the context of conflict and the need to increase MS. As previously mentioned, the theory closely relates to the aim of the course, which is to bring change among pre-service teachers. The core concept of TLT is, "one's meaning perspective or frame of reference – structure of meanings – changes through a process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand, and feel about our world" (Mezirow

1990, p. 14). Mezirow said that the process of transformation involves ten phases: “disorienting dilemma, self-examination with feelings of guilt or shame, critical assessment of epistemic, sociocultural, of psychic assumptions, recognition of one’s discontent and the process of transformation are shared and that others have negotiated a similar change, exploration of options for new roles, relationships, and actions, planning a course of action, acquisition of knowledge and skills for implementing one’s plans, provisional trying of new roles, building of competence and self-confidence in new roles and relationships, and reintegration into one’s life on the basis of conditions dictated by one’s new perspective” (1991, p. 168–169). Several researchers condensed the process into three or four steps (Herbers 1998; Merriam and Caffarella 1999; Taylor 2007). Some researchers pointed out that transformation can occur in any stage and at different speeds (Buchan 2011) These claims are in congruence with that of Mezirow (1991) who said that TLT is not a stage theory and its phases are not fixed stages of development. The phases are not linear and not all are required for transformative learning to take place (Cranton 1994; Mezirow 1994). With the aim of increasing MS, the most relevant phases of TLT are to be integrated into the online MS course that we will design: activating event or disorienting dilemma, critical reflection, and discourse. This is based on the consideration that transformation does not always occur in the exact sequence outlined by Mezirow and the phases can be simultaneously experienced by the learner. According to Taylor (2000), studies on transformative learning show that transformation is not always due to one experience but on the accumulation of situations.

According to Raikou (2018), disorienting dilemmas are “trigger events” which can be caused by external factors (other people, life conditions) or internal factors (a discovery, an effect of something). Dilemmas or activating events can be induced by the teacher through an eye-opening discussion, a book, poem, or painting (Mezirow 1990), a conversation and a sudden insight (Raikou 2018), or anything that triggers to assess one’s thinking or perceptions (McGonigal 2005). Another phase of TLT that will be integrated into the course design is critical reflection which is considered a distinctive component of transformative learning (Henderson 2002). Learners critically reflect on their beliefs, convictions, and points of view. Due to critical reflection, perspective change is experienced (Wang and Berger 2010). While Mezirow said that his theory is centered on critical reflection, he did claim that “it is not enough to understand intellectually the need to change the way one acts; one requires emotional strength and an act of will in order to move forward” (1991, p. 171). While critical reflection is the most solitary process of transformative learning, discourse is the most social aspect (McGonigal 2005). As one communicates with other people, one’s new perspective is validated and also gets to see alternative perspectives. As Taylor (1998) said, building relationships is essential in transformative learning.

Although transformative learning is often applied to adult learning (Taylor 2007), some studies applied its significance to younger undergraduate students (e.g., Brock et al. 2012; Curran and Murray 2008; Fullerton 2010; Harris et al. 2008; Kim et al. 2018). The theory has also been applied in online learning (e.g., Cranton 2010; Forte and Blouin 2016; Kim et al. 2018; Wansick 2007). The setting of an online class makes transformative learning effective because of better facilitation of learning through the exchange of information, communication, and collaboration (Meyers 2008). In Smith’s critical review of literature on fostering transformative learning online, she concluded

that it is possible to promote transformative learning with “(1) deliberate attention to a strong pedagogy in the design of the online course, (2) deliberate focus on learner-centered approach by the instructor, (3) deliberate attention to the students’ ability to interact with one another through sustained discussion and through the use of complex problems or issues in a safe environment, and (4) deliberate attention to students’ ability to engage in self-reflection” (2012, p. 411).

The online course is expected to bring the pre-service teachers to recognize their prejudices or biases, how they come to think and feel that way, and how their immediate environment has influenced their beliefs, attitudes, or actions toward cultural others. The TLT paradigm puts forward that learners do not only acquire new information but go through conditions and processes. When one goes through these processes, it is most likely that revision of perspective will take place (Cranton 2002).

## 2.2 Present study

Despite being a culturally diverse country, topics related to multiculturalism are quite understudied in the Philippines. On a similar note, the role of teacher education in developing cultural competence is understudied in Asia (Yuen and Grossman 2009). Since most studies on multiculturalism and multicultural education are conducted in the United States, there is a need to conduct these studies in other culturally diverse countries (Agirdag et al. 2016). While there are existing courses on MS, these were developed in contexts different from that of the Philippines and were mostly intended for people working in the health and business sector. Also, few studies have focused on how MS can be increased among pre-service teachers. Similarly, research on fostering transformative learning in an online environment is limited compared to face-face educational settings (Smith 2012).

A distinctive characteristic of this study is that to increase MS, different perspectives are combined – multiculturalism, TLT, and online learning. If found to be effective, the online course developed would help teacher training institutions produce more culturally sensitive teachers. These teachers could help promote cultural understanding in the classroom, which would then be translated into society. In the absence of a blueprint on developing MS, this study would help fill the gap in the literature. It can also add to the literature on how technology can be used to teach multicultural skills and how TLT can be applied in online course design.

In this paper, the following research questions are considered: a) How is the online course evaluated by experts and pre-service teachers? b) Did pre-service teachers’ MS increase after taking the online course?

## 3 Method

### 3.1 Participants

The first group of participants was involved in the study before the design and development of the online course. As part of the needs and target user analysis, two focus-group discussions (FGDs) were conducted - the first group was composed of ten pre-service teachers with an ethnic minority background and the second group was

composed of six pre-service teachers with an ethnic majority background. The pre-service teachers were in their last year of pre-service teacher training. Interviews were also conducted with five teacher educators. Participants of the FGDs and interviews were from different schools in Iligan City, which is one of the most diverse cities in Mindanao.

After the course was developed, five experts evaluated the course - three teacher educators who are practitioners and advocators of online learning, a professor in English with experience in developing audiovisual materials and is conducting research on culture, and a director of the multimedia center in an open university in the Philippines.

After the expert evaluation, the course was pilot-tested by ten pre-service teachers - four from ethnic minority groups and six from ethnic majority groups. The participants of the pilot-test were all volunteers. Following the pilot-test was the course implementation with 144 pre-service teachers involved. The study employed a one-group pre- and post-test design. The participants were purposively selected based on ethnicity and gender to ensure a heterogeneous sample. Among the 144 pre-service teachers, 97 (67.36%) completed the course. This rate is comparably high in contrast to the completion rate of MOOCs which is usually between 0.7% and 52.1% (Jordan 2015). There were 33 completers from the ethnic minority group and 64 from the majority group; in terms of gender, 21 are male and 76 are female. The 47 (32.64%) participants who were not considered as course completers were not able to finish all the modules or failed to submit some required outputs. After the course implementation, 14 completers were interviewed and the data are included in the analysis.

Participants of the pilot-testing and implementation of the course are pre-service teachers from Mindanao State University - Iligan Institute of Technology (MSU-IIT) who are in their first year of teacher training. They are members of the first batch of pre-service teachers who completed K-12 education since the Philippines recently implemented this system which also resulted in the revision of the teacher education curriculum. The age range of the participants is 17–22.

FGDs and interviews were audio-recorded while Google Forms was used to collect data during the expert evaluation, pilot-testing, and course implementation. All the participants of this study signed an informed consent.

### 3.2 Instructional design

The ADDIE model was used as a guide in the process of creating the MS course. ADDIE has five stages - analysis, design, development, implementation, and evaluation (Ghirardini 2011). The entire process is not linear because a succession of iterative steps were incorporated. Each stage was reviewed before proceeding to the next stage. It can be said that evaluation was repeatedly done before the course implementation.

**Analysis** The goal was to increase pre-service teachers' MS. With this, the analysis of the needs, target users, and topics were done. As part of the needs and target user analysis, FGDs with pre-service teachers and interviews with teacher educators were conducted. Topic analyses then followed to ensure that it lead towards the attainment of

the goal. To determine the topics to be included in the course, we looked into the literature on multicultural education and diversity teaching. Data from the FGDs and interviews and the factors of the MS scale (ethnocentrism, intercultural effort, intercultural stress, exhibiting multiculturalism, and monocultural orientation) we developed also served as guides in determining what topics to include in the online course. The focus of the course is on cultural diversity awareness and positive beliefs and attitudes towards people of different cultures.

**Design** In the design stage, the desired learning outcomes or objectives were formulated, objectives and topics were sequenced, and media, instructional strategies, and evaluation strategies were selected. The five modules are: discovering one's identity, history and diversity of the Philippines, cultural diversity in different contexts, multicultural sensitivity, and managing student diversity. A module on discovering one's identity was included since it has been found that before being able to work with diverse learners, it is important that one examines his/her identity as this can potentially impact how one deals with his/her students (Hollins 1996; Schmidt 1999). Having a better understanding of oneself can improve one's capacity to better understand others (Böckler et al. 2017). The module on the history of the Philippines and its diversity aims to develop an understanding on the development and description of diversity in the Philippines. It is expected that this will lead one to reflect on one's beliefs and attitudes towards other ethnic groups. As Guyton and Wesche (2005) said, consciousness of history is an aspect that multicultural teacher education should address. A module on the cultural diversity of different countries intends to show how cultural diversity is managed in other countries and what makes the Philippine context different. Topics on ethnocentrism, stereotype, prejudice, and discrimination were included and pre-service teachers are to examine their feelings and thoughts towards people from other ethnic groups, decide how to respond to cultural differences and certain cultural issues, as well as develop empathy towards those coming from a different group. Lastly, a module on managing student diversity was included since it is deemed important for pre-service teachers to realize the value of being able to effectively manage a culturally diverse student group.

With the aim of increasing MS, activating event or disorienting dilemma, critical reflection, and discourse were integrated into every module of the course. Each module started with an activating event, such as, identity chart activity, polls, picture activity, discussion board activity, and a video. In the middle part of the module, a reflection question is given. Questions such as how they perceive and interact with cultural others and interest in teaching in a culturally diverse classroom were asked. Since some may not be comfortable sharing their reflections, these are to be submitted directly to the course facilitator. For discourse to take place, pre-service teachers are to work in groups to analyze identity charts, make a position statement, discuss a poem about diversity, create a poster or flyer, and a photo essay. All group discussions are to be done in Google Hangouts and all the group outputs are to be posted in Padlet. There are also forums where pre-service teachers are encouraged to comment on the posts made. There is also a short time-pressured quiz at the end of each module. Including the group activity, each module can be completed in 4 h.

**Development** In this stage, the course materials (slide presentations, videos, readings) were produced and the online classroom was prepared. The course testing by the experts and pilot-testing by the pre-service teachers are part of this stage. Results of the tests and feedback from the experts and pre-service teachers served as a basis for revising some aspects of the course.

**Course Materials Development and Online Classroom Preparation** The majority of the course materials had to be developed from scratch since materials specially made for the Philippine context are limited. The development took place for a year and a half. The course materials were uploaded in an online classroom in the Moodle-based online learning environment of MSU-IIT. The activities were put in place and all the necessary instructions were indicated within the modules. An introductory video and a How-To section were also prepared to serve as references on how to go about the different activities in the course.

**Course Testing by Experts** Experts tested the course and utilized a rubric to evaluate it. The 23-item rubric is divided into five subscales (course objectives, course presentation, course design, interaction, and assessment). It has three levels of descriptors (unsatisfactory, sufficient, exemplary) for each item and were scored 1, 2, and 3 respectively. The items in the rubric were adopted/adapted from Anstey and Watson (2018), California Community Colleges (2016), Rogers and Van Haneghan (2018), Ternus et al. (2007), and University of Arkansas (2012). Aside from the rubric, the raters also gave suggestions on how to improve the course. Revisions were done to the course prior to pilot-testing.

**Pilot-testing by Pre-service Teachers** Participants in the pilot-test were given a maximum of 3 weeks to work on the course at their own pace. While the participants had the option to use their personal computers or phones, they were given access to two of the computer laboratories in the university if they found it difficult to access the course outside the university. Participants of the pilot-test evaluated the course using a four-point Likert. This scale will be further discussed in the Evaluation section. Based on the data from the pilot-test, revisions on the course were done before its implementation.

**Implementation** The researchers were able to secure approval from MSU-IIT's Research Ethics Committee and a Special Order from the Chancellor to allow the pre-service teachers to participate in the course implementation. Information sheets

containing instructions on how to access the course, a timeline, and a checklist were distributed to the participants. Since the selected pre-service teachers have different class schedules, we had to visit the classes they were attending to give an orientation and to have the informed consent signed. For this version, the online course was paced, that is, one module per week. Each week, a new module was opened but the preceding modules remained accessible. Completion tracking was activated – beside the course material or activity name is a checkbox that indicates whether the section was completed. The restricted access feature for course materials and activities was not activated since the participants might find it too constraining. Heterogeneous groups were created for the group activities and these were posted in the online classroom. The course was facilitated by one of the authors of this paper. Figure 1 is a sample module of the course.

**Evaluation** To determine whether an increase in MS is found, the Multicultural Sensitivity Scale for Pre-service Teachers (Ruales et al. [forthcoming](#)) was used in the pre- and post-tests. The 28-item seven-point Likert scale is composed of five factors - ethnocentrism, intercultural effort, intercultural stress, exhibiting multiculturalism, and monocultural orientation. Based on the given statements, respondents are to choose (very untrue of me, untrue of me, somewhat true of me, neutral, somewhat true of me, true of me, and very true of me) whether it best describes them or not. Items under ethnocentrism, intercultural stress, and monocultural orientation are negatively stated and thus are reverse coded. A higher score means more sensitivity (i.e., less or not ethnocentric) and a lower score means low sensitivity (i.e., highly ethnocentric). This scale has adequate internal consistency and is invariant for both ethnic majority and minority.

Participants during the implementation also evaluated the course using the same instrument used by the pilot-group. The course evaluation scale is a four-point Likert with four subscales (access and navigation, resources, activities, and self-directed and deep learning). Some of the items were adopted/adapted from the scale by the University of New South Wales ([2018](#)). The respondents are to indicate their level of agreement or disagreement (strongly agree, agree, disagree, strongly disagree) with the given statements. Aside from the Likert scale rating, pre-service teachers were also asked to identify whether they experienced change after taking the course, aspects of the course that influenced their change, other means of interaction with groupmates, best features of the course, difficulties encountered, and suggestions for improvement.

One limitation of the study is that it employed a one-group pre- and post-test design. Therefore, the degree of certainty to conclude that the treatment is responsible for the increase in MS needs to be supported with other data. Thus, after the course, participants were asked about their experience when they took the course and whether the online course changed them or not. Interviews with some course completers were also conducted. Results of all the evaluations are presented in the section that follows.

## MODULE 5. Managing Student Diversity



A multicultural society calls the need for teachers who are prepared to effectively teach a culturally diverse student group. This need shows that mastering the subject matter is not enough to become truly effective. In this module you will learn about the conceptual repertoires of diversity and multicultural education. You will also look into different programs that aim to make Philippine education more inclusive and responsive to diversity.

In this module, you are expected to: identify the conceptual repertoires of diversity; analyze the instructional consequences of the conceptual repertoires of diversity; define multicultural education; differentiate the dimensions of multicultural education; analyze how to manage a culturally diverse student group; realize the importance of improving students' understanding and respect towards others coming from a different ethnic group or culture; and identify programs and initiatives that aim to make Philippine education inclusive and responsive to diversity.

Start working on the module by participating in the polls. Click the links below.

-  The statement "I see all my students as the same" is...
-  Schools built for certain ethnic groups should not be allowed because students will develop extremism.
-  Presentation on the Conceptual Repertoires of Diversity
-  Reflection
-  Presentation on Multicultural Education and Philippine Educational System's Response to Diversity
-  Videos
-  Module 5 Quiz
-  Group Work
-  Answer the post-test

Fig. 1 Sample Module

## 4 Results

### 4.1 Research question 1: How is the online course evaluated by experts and pre-service teachers?

**Course evaluation by experts** Table 1 shows the mean ratings of the evaluation. Looking at the values, the course was rated high. To determine internal consistency or reliability, Cronbach's Alpha was computed, and the result was .746, which can be interpreted as "good". Inter-rater reliability was calculated using a two-way mixed, absolute agreement, average-measures intra-class correlation coefficient to determine the degree of agreement among the raters and the result was negative. One of the possible reasons for the negative value can be attributed to the background of the raters. The subjective nature of the scoring process is one of the reasons why ratings vary among individuals (Hornig et al. 2010). Another possible reason may be due to the restricted range of the rating instrument used (Hallgren 2012). However, the aim of the course evaluation was to check its quality and since no major issues were identified by the raters, revisions of the course were made. Some questions and instructions were

**Table 1** Descriptive Statistics and Reliability (Course Evaluation)

|                                 | N  | Min  | Max  | Mean  | SD   | Cronbach's Alpha | Intra-class correlation coefficient |
|---------------------------------|----|------|------|-------|------|------------------|-------------------------------------|
| Experts                         |    |      |      |       |      | .746             | -.650                               |
| Objectives                      | 5  | 2.33 | 3.00 | 2.800 | .298 |                  |                                     |
| Presentation                    | 5  | 2.67 | 3.00 | 2.833 | .118 |                  |                                     |
| Design                          | 5  | 2.33 | 3.00 | 2.767 | .325 |                  |                                     |
| Interaction                     | 5  | 2.60 | 3.00 | 2.760 | .167 |                  |                                     |
| Assessment                      | 5  | 2.00 | 3.00 | 2.667 | .408 |                  |                                     |
| Grand Mean                      | 5  | 2.57 | 3.00 | 2.774 | .172 |                  |                                     |
| Pilot Group                     |    |      |      |       |      | .832             | .423                                |
| Access and Navigation           | 10 | 2.67 | 4.00 | 3.500 | .478 |                  |                                     |
| Resources                       | 10 | 3.33 | 4.00 | 3.733 | .263 |                  |                                     |
| Activities                      | 10 | 3.20 | 4.00 | 3.760 | .310 |                  |                                     |
| Self-Directed and Deep Learning | 10 | 3.00 | 4.00 | 3.800 | .313 |                  |                                     |
| Grand Mean                      | 10 | 3.19 | 4.00 | 3.719 | .262 |                  |                                     |
| Implementation Group            |    |      |      |       |      | .929             | .909                                |
| Access and Navigation           | 97 | 2.00 | 4.00 | 3.072 | .574 |                  |                                     |
| Resources                       | 97 | 1.67 | 4.00 | 3.320 | .529 |                  |                                     |
| Activities                      | 97 | 2.20 | 4.00 | 3.260 | .500 |                  |                                     |
| Self-Directed and Deep Learning | 97 | 2.60 | 4.00 | 3.478 | .432 |                  |                                     |
| Grand Mean                      | 97 | 2.25 | 4.00 | 3.304 | .437 |                  |                                     |

revised for comprehensibility, rubric descriptors for group outputs were improved, and some presentations had to be divided for conciseness.

In general, the raters found the course to be well-designed and the course content to be very good. They indicated that the presentation of the content and technology being used supports the attainment of the learning objectives and therefore it could help in increasing pre-service teachers' MS. One of the raters explicated that *“The course will validate and/or invalidate what they have experienced, felt, think, how they would want to act, and how they chose to act (because they have to choose what is right in the eyes of the society despite the impulse to do otherwise). The activities allow the learner to interact with other learners and in his/her interaction with others, one is also given the opportunity to go on a personal journey — a journey in which one looks within and acknowledges one's struggles in dealing with others who he/she considers different from him/her”*.

**Course evaluation by pre-service teachers** It can be seen in Table 1 that the pre-service teachers rated the course fairly high. Looking closely at the ratings, access and navigation consistently incurred the lowest rating while self-directed and deep learning received the highest. The Cronbach's Alpha for the pilot and implementation group are both high. In terms of intra-class correlation coefficient, the value of the pilot group is considered “poor,” while that of the implementation group is “excellent”. Similar to the expert group, inter-rater reliability was computed using a two-way mixed, absolute agreement, average-measures intra-class correlation coefficient.

More than one-third of the participants in the implementation group identified the course materials (videos and slide presentations) as the course's best feature. This is followed by the topics discussed, reflection activities, and online mode of learning. About one third encountered difficulties with internet access and less than one-fourth experienced difficulties with time management and group activities. Some participants found working on the course challenging because they did it in addition to their required schoolwork. Suggestions for improvement widely vary— such as, implementing on blended mode, making course materials downloadable, simplifying some activities, adding and reducing course materials, and extending the time frame. Some recommended implementing the course without revision and several suggested that all pre-service teachers should be required to take the course.

Pre-service teachers who were interviewed found the course important because it is informative, extensively discusses the context of Mindanao, and greatly emphasizes the need to learn to accept and respect cultural differences. They believe it can help prepare pre-service teachers for cultural diversity in the classroom. The interviewees also found the progression of the topics to be well-thought and found themselves able to relate with the course since it reflects the realities that they encounter in their present context. Some also had personal experiences that are similar to what was shown in the course—being biased, being discriminated against, or ignored for being an ethnic minority.

All of the interviewees recommend making the online course a required component in the teacher training. Making the course a required component for pre-service teachers would help make them realize its importance and create more interest, thus leading the pre-service teachers to give more time and effort working on the course.

**Table 2** Descriptive statistics, reliability analysis, paired samples test, and effect size

|  | N  | Min  | Max  | Mean  | SD    | Cronbach's Alpha | Mean difference | Std. deviation | Std. error mean | t     | Significance (2-tailed) | Cohen's d |
|--|----|------|------|-------|-------|------------------|-----------------|----------------|-----------------|-------|-------------------------|-----------|
| <b>Ethnocentrism</b>                     |    |      |      |       |       |                  |                 |                |                 |       |                         |           |
| Pre                                      | 97 | 1.60 | 6.60 | 3.984 | .856  | .613             | .227            | 1.028          | .104            | 2.173 | .032                    | .244      |
| Post                                     | 97 | 1.00 | 7.00 | 4.210 | .992  | .743             |                 |                |                 |       |                         |           |
| <b>Intercultural Effort</b>              |    |      |      |       |       |                  |                 |                |                 |       |                         |           |
| Pre                                      | 97 | 2.25 | 7.00 | 5.833 | .855  | .783             | .219            | .875           | .089            | 2.465 | .015                    | .267      |
| Post                                     | 97 | 3.25 | 7.00 | 6.052 | .783  | .779             |                 |                |                 |       |                         |           |
| <b>Intercultural Stress</b>              |    |      |      |       |       |                  |                 |                |                 |       |                         |           |
| Pre                                      | 97 | 2.00 | 7.00 | 5.208 | .916  | .708             | .066            | 1.016          | .103            | .639  | .524                    | .068      |
| Post                                     | 97 | 1.00 | 7.00 | 5.274 | 1.015 | .793             |                 |                |                 |       |                         |           |
| <b>Exhibiting Multiculturalism</b>       |    |      |      |       |       |                  |                 |                |                 |       |                         |           |
| Pre                                      | 97 | 3.63 | 7.00 | 5.871 | .691  | .822             | .233            | .710           | .072            | 3.237 | .002                    | .335      |
| Post                                     | 97 | 3.63 | 7.00 | 6.104 | .698  | .865             |                 |                |                 |       |                         |           |
| <b>Monocultural Orientation</b>          |    |      |      |       |       |                  |                 |                |                 |       |                         |           |
| Pre                                      | 97 | 3.17 | 7.00 | 5.182 | .906  | .688             | -.046           | 1.004          | .102            | -.455 | .650                    | .049      |
| Post                                     | 97 | 1.00 | 7.00 | 5.136 | .982  | .771             |                 |                |                 |       |                         |           |
| <b>Overall Multicultural Sensitivity</b> |    |      |      |       |       |                  |                 |                |                 |       |                         |           |
| Pre                                      | 97 | 3.86 | 6.71 | 5.263 | .571  | .857             | .160            | .656           | .067            | 2.400 | .018                    | .258      |
| Post                                     | 97 | 3.48 | 7.00 | 5.422 | .660  | .904             |                 |                |                 |       |                         |           |

The interviewees believe that the course can help prepare pre-service teachers in dealing with diverse students which leads to eliminating ethnocentrism and increase of awareness on the need to understand cultural differences. Furthermore, they found the course valuable since it showed the importance of multicultural sensitivity not only in the classroom but in the society at large.

The majority of the interviewees suggested that in the next implementation of the course, individual activities remain online while group activities should be face-to-face with a common schedule set by the facilitator. Other suggestions include allowing participants to choose their groupmates, placing subtitles and minimizing the length of some videos to 7 or 8 min, making course materials downloadable, extending the time for quizzes, and setting the system to block late submissions. A face-to-face in-depth orientation session was also recommended to improve course implementation.

#### 4.2 Research question 2. Did pre-service teachers' MS increase after taking the online course?

T-test was conducted to determine significant differences between pre- and post-test MS scores. The figures in Table 2 show that with a significance level of 0.05, there was a significant increase in the scores for MS (overall). Positive effects are found for the following subscales: ethnocentrism, intercultural effort, and exhibiting multiculturalism. No significant difference was found between pre- and post-test scores for intercultural stress and monocultural orientation.

To determine the effect size, Cohen's *d* was computed. An effect size will tell whether the difference is significant or how substantially the pre-and post-test scores differ (Madsen et al. 2016). The suggested effect size values are: .2 for small, .5 for medium, and .8 for large (Cohen 1988). The Cohen's *d* values shown in Table 2 are

**Table 3** Subjective Data (Implementation Group)

| <i>N</i> = 97  | n  | %    |
|--|----|------|
| Experienced positive change  | 82 | 84.5 |
| Questioned their attitudes and behaviors towards other ethnic groups                                       | 62 | 63.9 |
| Thought about changing the way they relate or deal with other ethnic groups                                | 31 | 32   |
| Tried to act more positively towards other ethnic groups   | 48 | 49.5 |
| Became more careful on the way they deal with other ethnic groups  | 45 | 46.4 |
| Noticed that their group mates also questioned their own beliefs and attitudes towards other ethnic groups | 49 | 50.5 |
| Influenced their Change  |    |      |
| Polls  | 35 | 36.1 |
| Individual / Personal Reflections  | 82 | 84.5 |
| Group Activities   | 31 | 32   |
| Forums   | 57 | 58.8 |
| Lessons / Course Materials (slide presentations, videos, readings)   | 76 | 78.4 |
| Structure of the Course  | 37 | 38.1 |

less than .5 and thus interpreted as a small effect size. While a statistically significant increase in some of the scores were found, the differences are modest based on Cohen's *d* values. However, it is actually important that in the first implementation of the course, a modest effect size was found. Future research will determine whether the effect size differs across engagement levels.

The values in Table 3 show that 82 or 84.5% of the pre-service teachers claimed to have experienced a positive change in their values, beliefs, opinions, or attitude. All of the participants who claimed to have experienced change identified reflection as the aspect or one of the aspects of the course that influenced their change. Lessons/course materials came in second while forums ranked third. It can also be seen in Table 3 that only 31 participants (32%) see the group activities as having an influence on their change. Other experiences of the pre-service teachers when they took the course are also shown in Table 3.

The participants who were interviewed identified the reflection activity as the most liked activity. This is due to the reason that they were able to examine their existing beliefs and attitudes as well as make meaning out of what they learned from the course and how it applies to them. Some mentioned that they were comfortable with the idea that their peers will not read their output for this activity. For the group activities, it was surprising that while difficulties have been repeatedly mentioned, a number of the interviewees liked the said activities because they found it interesting and had the chance to collaborate, hear different perspectives, and even showcase the skills of the group members in creating group outputs.

Since it was not a required course for pre-service teachers in the university where the course was implemented, several challenges were met. Even with the reminders posted in the online classroom, a huge drop in the user statistics was observed in the second week of the course. Certificates of completion were offered and professors supervising the pre-service teachers assisted in the tracking of the participants' progress. Though heterogeneous groupings were created by the researchers, the participants requested to be given the liberty to form their groups. This was allowed by the researchers, but a maximum of seven members for each group was set. The Google Hangouts Chat Groups created were not widely used since the participants found it more convenient to communicate with each other through Facebook or text messaging. While the course was designed to be purely online, the majority of the groups met face-to-face for the group activities. On the other hand, in terms of commenting on forums and group outputs posts, this was observed to be quite low. As one participant said, most participants may not regularly log-in to the online classroom, thus missing the posts' notifications. Lastly, almost all of the messages that the course facilitator received from the course participants were concerns regarding the groupings and group activities.

## 5 Discussion

This study aimed to determine whether pre-service teachers' MS can be increased through a Transformative Learning Theory (TLT)-based online course. This study is essential since there is no blueprint on how to increase MS despite the need to prepare pre-service teachers to teach culturally diverse students.

In this study, the majority of the participants claimed to have experienced positive change through the online course. This is consistent with the results of the pre- and post-test scores wherein a significant difference was found in overall MS and some of the factors of MS particularly, ethnocentrism, intercultural effort, and exhibiting multiculturalism. Therefore, we can say that integrating phases of the TLT into the design of the online course provided the participants an experience that increased their awareness of their biases and assumptions which brought them to question their beliefs and attitudes and thus resulted in its change. This finding is similar to the claim of Bennett (1986) and the Waitemata District Health Board (2010). They said that MS could increase if there is an awareness of one's biases and assumptions as well as a desire to change one's attitude. Some of the participants who were interviewed claimed that their perception towards people from other cultures changed and that they are trying to be more understanding, accepting, and more mindful when dealing with people from other ethnic groups to avoid offending them. Therefore, we can say that integrating selected phases of the TLT into the design of the online course contributed to the increase in MS.

Considered a distinctive component (Henderson 2002) and the center of TL (Mezirow 1991), the reflection activities brought the participants to examine one's thinking and feelings while creating meaning based on the knowledge gained from the course and reflecting its applicability in their personal contexts. When participants were asked about the aspect of the course that influenced their change— reflection activities, lessons/course materials, and forums were the top three identified. This shows the importance and impact of reflection on the transformation of the pre-service teachers. The 82 pre-service teachers who claimed to have experienced positive change due to the course all said that the reflection activity influenced or was one of the activities that influenced the change. It can also be said that the online nature of the course helped in the process of reflection since students have more time to think and reflect before making a post, especially when they had to answer questions that are sensitive in nature. Students were also able to go through the course materials at their own pace and have the opportunity for more time to study the content. While each module can be finished in 4 h, only one new module per week is made available on the platform. However, students also have the opportunity to return to the preceding modules since those remain available for student access.

Based on the interviews and participants' responses to open-ended questions, emotions played a role in their transformation. Some participants mentioned experiencing feelings of shame and guilt as they were exploring the course materials and performing the activities. There were narratives of great empathy and emotions since they were able to associate their own experiences and context with what is reflected in the course. While transformation cannot be taught (Cranton 2002), targeting not only the cognitive but also the affective aspect helped in bringing about transformation to the majority of the participants.

Polls, self-evaluations, forums, and a video served as activating events. However, these were not explicitly identified to the participants as such; hence, one cannot be conclusive whether they (as a collective) had an impact on the transformation process. Upon individually examining these activities, it was found that these activities have influenced their change: some respondents claimed that answering the polls and seeing its results were meaningful since it made them reflect on their stand in some issues

while analyzing the reasons why others think differently from them; the video used for “activating event” was also identified by almost all of the interviewed participants as the most impactful because of the message implied; and over half of the participants identified the forums as having an influence on their change. We can, therefore, say that the activities triggered changes in one’s beliefs and attitudes.

Almost 25% of the participants encountered difficulties with the group activities, while a majority saw its importance and did not recommend their removal. Instead, participants recommended changes for the implementation to facilitate the conduct of the activity. While the group activities were set to be done online, the participants chose to meet face-to-face; thus, it is impossible to analyze their discussions and instead depend on their narratives. The interviewees expressed that the group activities allowed them to listen to the perspectives of others, share realizations, and discuss issues. Their preference to choose who to work with during group activities is not solely rooted in convenience to arrange meetings, but they also felt that they would be less inhibited, more open, and comfortable in sharing their thoughts. As Smith (2012) said, the feeling of a “safe” environment helps foster transformative learning.

While the findings are supported with the results of the T-test, Cohen’s *d* values indicate that the effect size is modest. The amount of the increase in scores might have been affected by the circumstances of the course implementation based on the pre-service teachers’ statements on the difficulties they encountered when they took the course. Since it was not a required component of their pre-service training, commitment cannot be compelled from them. While they may have understood the need to change, the important components of transformation according to Mezirow (1991) which are emotional strength and act of will may have been hampered by the necessity to finish the course since they have been chosen to participate and were also endorsed by the university’s administration. Another notable aspect is the possibility that the participants rated themselves too high in the pre-test. The small Cohen’s *d* values should not lead to hasty conclusions that the course failed to provide a transformative learning experience since pre-service teachers’ accounts about their experience say otherwise. Implementing the course with a different group would prove to be helpful.

The absence of a statistically significant change in intercultural stress and monocultural orientation may be attributed to a lack of emphasis in the course or changes in these aspects takes time before a significant change can be found. In the case of monocultural orientation, participants may have rated themselves too high during the pre-test and had realizations while and after taking the course. Monocultural orientation deals with the ways and practices that manifest cultural and linguistic homogeneity in schools. After taking the course, they may have felt that dealing with students in the real context is different from what they perceived. This section of the scale may have also drawn mixed reactions because in the Philippines, mother tongue is used as the medium of instruction from kindergarten to Grade 3 while English and Filipino are used from Grade 4 to Grade 10. In college, English is used as the primary medium of instruction except in specific courses.

The findings of this study show that not all phases of TLT are needed for transformation to take place. It is possible to only integrate TLT’s most relevant phases. As Smith (2012) said, giving attention to a strong pedagogy in the course design can help

foster transformation. The findings of this study support the statement of Cranton (2010) about the possibility of transformative learning in an online class. However, it should be noted that the circumstance of the course implementation may have affected the modest effect size.

## 6 Conclusions and recommendations

The online MS course designed and developed in this study has a strong potential for a transformative learning experience for pre-service teachers. The results of this study show that transformative learning is possible through an online course and an online learning environment can be utilized to change MS or teach multicultural skills. While it is difficult to quantify the extent of the effect of the online environment on the increase in MS, we can conclude that the synergy of selected course content, integration of selected phases of TLT, and affordances of online learning fostered the increase of MS.

A higher increase is probable if the course is made a required component of the pre-service teacher training. This will ensure commitment and effort on the pre-service teachers' part when taking the course. It would also be beneficial if the course is implemented a semester prior to practice teaching because it is the period in which pre-service teachers start their classroom exposure. While there are limitations in the design and implementation of the course, the findings of this study are useful and significant as it adds to the literature on the application of TLT in online course design and how to increase the MS of pre-service teachers to prepare them for culturally diverse classrooms. In future studies, it is recommended to use randomized control groups to control history, maturation, test effects or regression to the mean effects.

Before deploying a course online, it is important to conduct needs and target audience analysis since the characteristics of the context may be entirely different from this study. It is essential to consider the computer skills of the target learners and determine their access to a computer with Internet so that a schedule to use the school's computer laboratory can be arranged. It is advised that the course can be accessed through a smartphone (with Internet) because it is more likely that students own one. It is recommended to prepare a guide on how to go through the course and perform the different activities. Giving a face-to-face orientation is also helpful. There should also be consideration on the type and length of course materials, such as, presenting information in different formats and by chunks.

While the course activities and integration of TLT may be adopted, it is essential that the course content is tailored for the context. This will enable students to associate their own experiences and context with what is reflected in the course. Making the course materials downloadable is also helpful so that students can go through the content without the need to go online, except for group activities, discussion board activities, and submitting reflections. However, with this option, the amount of time spent studying the course content cannot be tracked. While this course is loaded in a Moodle-based online learning environment, the use of other learning management systems is possible. Lastly, it is of paramount importance that the course facilitator is knowledgeable about the course and teaching online and can give prompt feedback.

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**Availability of data and materials** The datasets used and analyzed and online course developed in the current study are available from the first author on reasonable request.

**Authors' contributions** The online course was designed, developed, and implemented by Shelanee Theresa P. Ruales as part of her Ph.D. research. Orhan Agirdag, Wim Van Petegem, and Josefina M. Tabudlong assisted in the design of the online course. Shelanee Theresa P. Ruales and Orhan Agirdag performed the data analysis and interpretation. All of the authors significantly contributed in the preparation of this paper.

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## Compliance with ethical standards

All of the research participants were made aware of the purpose of this research and signed an informed consent.

**Competing interests** The authors declare that they have no competing interests.

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## Affiliations

Shelanee Theresa P. Ruales<sup>1,2</sup> · Wim Van Petegem<sup>3</sup> · Josefina M. Tabudlong<sup>4</sup> · Orhan Agirdag<sup>1,5</sup>

<sup>1</sup> Laboratory for Education and Society, KU Leuven, A. Vesaliusstraat 2, 3000 Leuven, Belgium

<sup>2</sup> College of Education, Mindanao State University – Iligan Institute of Technology, Iligan City, Philippines

<sup>3</sup> Faculty of Engineering Technology, KU Leuven, Willem de Croylaan 56 / 00.16, 3001 Leuven, Belgium

<sup>4</sup> College of Education / College of Arts and Social Sciences, Mindanao State University – Iligan Institute of Technology, Iligan City, Philippines

<sup>5</sup> Department of Educational Sciences, University of Amsterdam, Amsterdam, The Netherlands