Transforming future public health professionals through open and distance learning (ODeL)

Case study of UPOU's International Health Program in the Philippines

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Abstract

Purpose – Open and distance e-learning (ODeL) practices have substantial contributions to make in achieving societal development goals. The challenge however remains with enhancing skilling, training and educating professionals who will contribute to this progress. The purpose of this paper is to illustrate how transformative education and training in global health can be undertaken through ODeL in increasing the quality, quantity and relevance of health professional education and training.
Design/methodology/approach – This paper is based on a descriptive qualitative case study of the International Health and Development Course offered by the University of the Philippines Open University and is thus limited in its scope from other courses in the program.
Findings – Transformative education and training through ODeL has the potential of increasing the quality, quantity and relevance of health professionals training. However more critical assessment of transformative learning outcomes is needed via rigorous methods of objectifying such outcomes. Achieving transformative health education and training requires rigorous engagement in constructivist-oriented experiential learning that allow learners to be accustomed to significant interactions achieved by involvement in problem-based methods accomplished through small group e-tivities in order to demonstrate applicability in the real work context.
Originality/value – The outcome of this paper is relevant to institutions in Asia that offer ODeL-based global health programs through open knowledge systems in order to produce graduates who are more responsive to the evolving health needs amid twenty-first century global health challenges.

Keywords Public health, The Philippines, Constructivist pedagogy, ODeL,
Transformation and scaling up training
Paper type Research paper

Introduction: the "crisis in health human resources" and need for new professional education and training

The World Health Organization (WHO) warns that the world is short of 7.2 million health care workers and where this is expected to rise to 12.9 million by 2035 (World Health Organization (WHO), 2014). In this regard, a basic threshold of 23 skilled health

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professionals per 100,000 people is required. Many countries are steadily progressing toward this target though approximately 83 countries are still lagging behind (WHO, 2014). As a result, the WHO warns of a looming crisis in human health resources in countries below the prescribed threshold given that an estimate 8.9 million health professionals are serving a population of 4.7 billion, translating to a global deficit of 7.2 million skilled professionals (WHO, 2014). Several key causes of this deficit are attributed to an aging health workforce, staff retirements and not enough young people entering the profession or being adequately trained (WHO, 2014). Increasing demands are also being put on the health sector from a growing world population and that of increasing risks of non-communicable diseases. Internal and international migration of health workers is also exacerbating regional imbalances (WHO, 2014, p. 35). Asia records the largest shortages in health care workers in numerical terms. This deficit is smallest in the European regions pegged at 0.07 million or 1 percent of the total deficit and acutely high I Sub-Saharan Africa (WHO, 2014, p. 36). Southeast Asia which has 27 percent of the world's population, accounts for nearly half of this deficit, amounting to 3.4 million (47 percent). Aluttis *et al.* (2014, pp. 1-3) describe this crisis in the health sector as "one of the most pressing global health issues where the shortage of health workers has the greatest impact in low-income countries characterized by insufficient public investment resulting in too few people being trained and further exacerbated by migration of health care workers from low and middle income counties to high income ones." Frenk *et al.* (2010, p. 1923) note in this regard that professional education has not kept pace with the evolving challenges in healthcare training and education due to their "fragmented, outdated and static curricula which tends to produce ill-equipped graduates." The causes of such low level of education and training are attributed to systemic problems attributed to the "mismatch of competencies to patient and population needs, poor teamwork, persistent gender stratification of professional status, narrow technical focus without broader contextual understanding, episodic encounters rather than continuous care, predominant hospital orientation at the expense of primary care, quantitative and qualitative imbalances in the professional labor market, and weak leadership to improve health-system performance" (Frenk *et al.,* 2010, p. 1923). Ergo, without substantial interventions, such trends will create severe implications for the global population health in that "a global under-supply threatens the quality and sustainability of health systems worldwide" (Frenk *et al.*, 2010, p. 1923).

In the age of globalization and international migration, distance learning, especially web and internet based, offers an opportunity for students to scale up their knowledge and skills. E-learning is now regarded as an effective tool in healthcare workforce training and development (Safie and Aljunid, 2013, p. 590). It has in some way positive effect on the learning process by providing the learner with supplementary and updated knowledge that may not otherwise be acquired in a traditional classroom-based instruction. Through e-learning, Safie and Aljunid (2013, p. 590) opine that "healthcare workforce can easily access, monitor and record their learning progress and where if properly executed, the method can be an effective tool to support learning as a collaborative, collective and social experience." In their review of numerous articles about distance learning in healthcare, Knebel (2001) highlighted the major benefits of such approaches to education notably its convenience to both faculty and students alike and in the accessibility of training. The importance of improving accessibility to such learning and knowledge transfer would in effect address issues pertaining to the expertise in the healthcare sector of those developing countries experiencing "crisis in

health human resources" given evidences on the effective use of e-learning in healthcare education in such contexts (Chhibber, 2004). Allegrante *et al.* (2009, p. 427) therefore posit that "the increasing prevalence of infectious and chronic diseases, as well as the deteriorating public health infrastructure in many settings in the world in part requires for renewed interest in the professional preparation and training of the public health workforce." This is because health has become the center of many important global issues, including economic development, global security, effective governance and human rights promotion (Frenk, 2010, p. 1). Frenk *et al.* (2010, p. 5) therefore recommend for a "a redesign of professional health education as necessary and timely in view of the opportunities for mutual learning and joint solutions offered by global interdependence due to acceleration of flows of knowledge, technologies, and financing across borders, and the migration of both professionals and patients." Such efforts can then be geared toward the transformational scaling up of health professionals' education and training in order "to increase the quantity, quality and relevance of health professionals, and in so doing strengthen the country health systems and improve population health outcomes" (WHO, 2014, p. 11).

Ergo, this paper provides a discussion on international health programs in Asia with respect to transforming and scaling up health professionals' education and training aimed at developing more responsive health practitioners in the face of twenty-first century global health challenges. The paper is informed by a descriptive qualitative case study of the University of the Philippines Open University's (UPOU) International Health Program, by assessing the International Health and Development (IH 201) Module. The purpose of this paper is to critically illustrate how transformative education and training through ODeL can aid in increasing the quality, quantity and relevance of health professionals. The outcome of this paper is relevant to institutions in Asia in particular that offer ODeL-based international public health programs which through open knowledge systems can produce graduates who are more responsive to the evolving health care needs of both local and global populations amid twenty-first century global health challenges.

Theoretical framework

According to Swan (2005, p. 4), learning theories are referred to social constructivist when "their main concern is with knowledge construction through social interactions. This theory is drawn from the work of Lev Vygotsky (1978) who opined that all learning is a result from social interaction where meaning becomes socially constructed through communication, activity and interactions with others (Swan, 2005, p. 4). As such, meanings are learned collectively and later internalized individually and where the latter in turn guides social interactions. This schema of learning formed the basis of Piaget's (1952) concept of cognitive construction, an epistemology that attempts to locate individual learning as an outcome of mental construction liked to interactions with the environment (Swan, 2005). According to Gold (2001, p. 37), "constructivism is an alternative epistemology [to objectivism] of how people learn and assimilate new knowledge" through a process that produces "cognitive structures that are similar to the experiences of those who are engaged." Gold (2001, p. 38) contends that from this perspective, interpretation constructivism can include different types of knowledge construction where the goal is for the learner "to build, or re-invent knowledge." Learning by the student is therefore gained through the ability of focusing "on concrete situations and understand not only the facts but also the context in which these facts are placed) (Gold, 2001). A constructivist approach is therefore one that is learner-centered and based

on "authentic learning" in which problems and scenarios reflect student's lives (Gold, 2001; Carwile, 2007). In the online platform, Thorman *et al.* (2013, p. 297) posit that online constructivist learning requires students to critically engage with new information through problem solving, analysis and the interpretation of new information through prior beliefs, experiences and perspectives where the role of the instructor is de-centered as a facilitator whose essence is to guide learners toward critically engaging with the material and collaborate with peers while rarely imparting knowledge directly (Carwile, 2007). This process of collaborative learning and its ultimate outcome aligns with Bloom's (1956) taxonomy of cognitive learning which starts from general knowledge acquisition to a higher order critical evaluation of synthesized knowledge, a process described as one of "deeper learning and a greater degree of cognitive processing" (Adams, 2015, p. 152). Bloom's (1956) taxonomy was later revised where the level of "synthesis" was placed above that of "evaluation" to become the highest level of cognitive learning a la Anderson and Krathwohl (2001).

It is the contention of Adams (2015, p. 153) that the alteration of Bloom's (1956) original model adds a new dimension across all six cognitive processes where learning activities become specified by four types of knowledge, namely, factual (terminology ad discrete facts); conceptual (categories, theories, principles and models); procedural (knowledge of a technique, process or methodologies); and metacognitive (self-assessment ability and knowledge of various larding skills and techniques). These four cognitive knowledge types aligns with that by Gold (2001) who equally used four components of the constructivist approach, namely, assimilation, accommodation, equilibrium and disequilibrium, originating in Piaget's (1977) theory on knowledge construction, to analyze online education and student learning outcome. The stage of assimilation involves a process by which one associates new events with existing knowledge and prior conceptions, usually done through reviews of empirical literature, the stage of accommodation that involves changing existing structures to new information. According to Hughes *et al.* (2004, p. 264), these two levels of Piaget's cognitive learning relates to Bloom *et al.*'s (1964) lower levels. The intention at the higher levels is to develop student's abilities to analyze their conceptual construct of a subject. Piaget (1977) in this regard adds the following two levels: equilibrium involving the balancing of one's understands with that of others, and disequilibrium, which involves experiencing a new event without necessarily achieving equilibrium (Piaget, 1977). As such, the achievement of disequilibrium as the highest order of cognitive learning relates to both Salmon's (2002, p. 10) "Self-reflection Stage" and Bloom's revised taxonomy placing "synthesis" at the top of the learning order (Anderson and Krathwohl, 2001; Krathwohl, 2002). Salmon's five stages model outlines means by which online learning can be achieved and the role of e-moderators in this process (Salmon, 2003). According to Gash (2012, p. 233), Salmon's pedagogical model adopts a social constructivist perspective in describing the steps through which learners, while aided by their e-moderators, can become acclimatized to their class environment (access and motivation), become acquainted with their peers (socialization), research and share information (information exchange), deliberate on meaning and co-construction of knowledge (knowledge construction) and lastly to condense newly gained knowledge and understanding through self-refection (development). The ultimate outcome is for individuals to become sophisticated in their ability to reflect on and transfer knowledge gained through integration of their online experience (Salmon *et al.*, 2010).

Emphasizing contextual relevance of constructivist models of learning has witnessed other conceptual frameworks such as Wenger's (1998) theory to online

learning context that seeks toward the building of a "Community of Practice", and Moule's (2007) e-learning ladder approach that aims at enhancing Wenger's "Community of Practice" in determining student's ability to interact among peers in "joint enterprise and shared repertoire with knowledge and learning gained within the community" (p. 43). According to Moule (2007), Wenger's (1998) theory has been applied in a number of studies such as that in the evaluation of a virtual learning environment to build support for an undergraduate medical course (Ellaway *et al.*, 2004) to that of analyzing electronic interactions among researchers for a project that sought to consider children's representation of information and communications technology (Somekh and Pearson, 2000). Moule's (2007) e-learning ladder model on the other hand acknowledges a range of learning approaches, "starting at the bottom 'rung' that might be termed as instructivist, and moving through the 'rungs' ending with constructivist, or interactive learning approaches" (Moule, 2007, p. 42). Such pedagogical approaches can therefore be adopted in the online platform in efforts geared toward the transformational scaling up of health professionals' education and training as called for by the WHO (2014).

Methodology

The study seeks to describe means by which transformative learning via a constructivist approach to knowledge construction occurs in the IH 201 Course. This paper is based on a descriptive qualitative case study (Baxter and Jack, 2008; Yin, 2003) of the IH 201 course offered under the DIH program at the UPOU which the author has been the faculty-in-charge (FIC) for the past three years. The paper acknowledges its limitation in its scope by assessing only this particular course in the overall International Health Program offered at UPOU. The course takes into cognizance developments in recent discourse in international health (Appendix 1) and is delivered entirely through e-learning platform via virtual classrooms run in MyPortal, a Moodle-based online learning management system of UPOU (Faculty of Management and Development Studies, 2015). Students have access to open educational resources (OERs) to aide in their learning experience. OER and Open educational practices are strongly fronted and used to train and support professionals in situations where funding and resources are scarce (Coughlan and Perryman, 2015). There were a total of 91 enrolled students in the course but where only 40 who actually took and completed the course. Data for the study were collected principally from student feedback (qualitative), student evaluation of teacher (SET) survey, and from the course guide highlighting samples of tasks done. Data were also gathered from the SET survey received from 14 students (35 percent of the total who completed the course). These scores were based on a Likert scale where 1 is ranked as "strongly agree" and 5 as "strongly disagree" on the following sections: course guide, learning resources, learning activities, discussion forums, student learning, student support, course site and on the FIC. Faculty feedback was however not solicited in informing the study and one that is recommended in future studies in order to add to rigor.

The analytical framework of this case is guided by Piaget's (1977) learning concepts of assimilation, accommodation, equilibrium and disequilibrium which Gold (2001) equates to a process of transformative learning as pedagogically rooted in Mezirow's (1991) transformative learning theory, the latter which views learning as a collaborative process in critical reflection to develop new perspectives, skills and behaviors (Cranton, 2006). According to Wittich *et al.* (2010, p. 1791) in reference to Piaget's (1977) constructs, the transformative learning process begins with experiencing a

"disorientating dilemma", like a life event, which causes the learner to pause and question underlying beliefs and assumptions and ends with critical reflection on the "disorientating dilemma" to expose the learner's limitation and areas for improvement (Piaget, 1977). Beckman and Lee (2009) contend that the learner can in such a process address these limitations by acquiring new knowledge, skills and or attitudes. Transformation therefore occurs when learners are provided with fresh perspectives and powerful means for enacting improvement (Wittich *et al.*, 2010, p. 1791).

Results

To aid students in constructive learning in an enquiry-based manner, the IH 201 course generally comprises of student-led discussion forums complemented by self-gauging multiple-choice quizzes. Further discussions are aided by faculty moderated discussions. Timed online multiple-choice midterm and final exams also constitute part of overall student assessment evaluation of student learning is done by gauging their development of critical viewpoints on topical issues as drawn from both personal experiences and from reading the literature. Table I aligns with Piaget's (1977) learning concepts notably: assimilation, accommodation, equilibrium and disequilibrium and their respective instructional principles with module tasks in order to illustrate the constructivist component in the IH 201 course. According to Gold (2001, p. 39), the aim of a constructivist approach to learning is not outcome *per se*, but rather aiding students in their own ability to acquire knowledge.

Discussion

The transformative learning process in the IH 201 course

In an ODeL context, a constructivist syllabus or curriculum is what Gold (2001, p. 36) opines as being "less content-oriented and more learner-centered where the designer goal is to create an information-object rich, and socially meaningful (i.e. communication and collaboration filled) learning environment." The role of the instructor is one of a facilitator (Salmon, 2002) in aiding the learner understand multiple perspectives through reflection of authentic tasks (Flavell, 1993). In such a setting as highlighted in Table I, the learning environment allows to students to start with observations within a world of authentic artifacts rooted in authentic (professional practice) situations. Students while in the process of accessing various OERs, construct ongoing interpretations of their readings and experiences, and collaborate interactively with their peers via student-led discussions. Small group case-based discussions (SGDs) can aide in this learning process as attested by the work of Hilvano *et al.* (2014). The authors (Hilvano *et al.*, 2014, p. 29) empirically validate that SGDs based on case-based problems can enhance critical thinking skills, improve self-esteem, cultivate a positive attitude toward learning, increase motivation and improve interpersonal skills. In such a structure, the iteration rate is usually set by the students themselves and where the "freedom of this situation can lead to much deeper and wider debate" (Cartwright, 2000; Dysthe, 2002). As such, an increase in the level of deliberations presupposes that the student will be active in their engagement since students are believed to be "capable of assessing their own learning needs and will learn best when given the autonomy to meet them in their own way" (Rogers, 1983) especially when students are allowed to serve as coaches and teachers to each other in order to show mastery of what they learned (Gold, 2001, p. 38).

For illustrative purposes and in light of the case study in discussion in this paper, students were tasked for their first student-led discussion activity (SLDF) (out of six such tasks in the entire course) to undertake a problem solving activity on

Module sessions	Instructional principles	Cognitive learning concepts and indicators
Introduction		
Post your self-introduction in the course site in MyPortal	Orientate the learner to their online learning environment	Assimilation
Introduce yourself, your institutional affiliation, professional background, and your expectations from the course	Assess the learner's prior knowledge and experience	Assimilation
Read the course guide Explore the course site Seek clarification on the content of the course	Solicit problems from the learner and to use these as stimulus for learning activities as an end of program project	Assimilation
Weeks 2-3 Unit I. Overview of international health and development		
Read assigned readings Answer the study guide questions and discuss the answers in the forums Participate in faculty moderated discussion forum (DF) 1 Prepare for faculty marked assignments (FMA) 1	Anchoring all learning activities to a larger task (DF and FMA) so that the learner can perceive and accept the relevance of the specific activities in relation to the larger tasks	Assimilation
	Learning environment is designed to support and facilitate critical thinking	Accommodation
	Encourage testing ideas in discussions against alterative viewpoints and contexts	Accommodation
	Opportunities provided to reflect on both the learning content and process of the unit	Equilibrium
	Challenging misconceptions	Disequilibrium
Submit FMA	Test for reinforcement	Accommodation
Weeks 4-7 Unit II. Major global health issues		
Read assigned readings Answer the study guide questions and discuss the answers in the forums	Learning environment designed to support and facilitates critical thinking	Accommodation
Take self-gauging quiz Participate in Student-led discussion forums and production of group projects (reports, policy briefs, proposals, action plans and iterative essays) Provide group summaries on the module content *vis-à-vis* practice	Encourage testing ideas in discussions against alterative viewpoints and contexts	Accommodation
	Designing a student-led task where cognition is consistent with professional practice in the field	Equilibrium
	Opportunities provided to reflect on both the learning content and process of the unit	Equilibrium
	Challenging misconceptions	Disequilibrium
Submit FMA 2	Test for reinforcement	Accommodation
Week 8		
Mid-term exam	Test for reinforcement	Accommodation

(*continued*)

Table I. Constructivist component of modules in IH 201

Module sessions	Instructional principles	Cognitive learning concepts and indicators
Weeks 9-11 Unit III. Health and development		
Read assigned readings Answer the Study guide questions and discuss the answers in the forums Take self-gauging quiz Participate in student-led discussion forums and production of group projects (reports, policy briefs, proposals, action plans and iterative essays) Provide group summaries on the module content *vis-à-vis* practice	Anchoring all learning activities to a larger task (DF and FMA) so that the learner can perceive and accept the relevance of the specific activities in relation to the larger tasks	Accommodation
	Learning environment is designed to support and facilitate critical thinking	Accommodation
	Encourage testing ideas in discussions against alterative viewpoints and contexts	Accommodation
	Opportunities provided to reflect on both the learning content and process of the unit	Equilibrium
	Challenging misconceptions	Disequilibrium
Submit FMA 3	Test for reinforcement	Accommodation
Weeks 12-14 Unit IV. Strategies for addressing international health challenges		
Read assigned readings Answer the study guide questions and discuss the answers in the forums Take self-gauging quiz Participate in student-led discussion forums and production of group projects (reports, policy briefs, proposals, action plans and iterative essays) Provide group summaries on the module content *vis-à-vis* practice	Anchoring all learning activities to a larger task (DF and FMA) so that the learner can perceive and accept the relevance of the specific activities in relation to the larger tasks	Accommodation
	Learning environment is designed to support and facilitate critical thinking	Accommodation
	Encourage testing ideas in discussions against alterative viewpoints and contexts	Accommodation
	Opportunities provided to reflect on both the learning content and process of the unit	Equilibrium
	Challenging misconceptions	Disequilibrium
International cooperation and partnerships		
Read assigned readings Answer the study guide questions and discuss the answers in the forums Participate in discussion forum 4 Prepare and submit FMA 4 Prepare for final exam	Anchoring all learning activities to a larger task (DF and FMA) so that the learner can perceive and accept the relevance of the specific activities in relation to the larger tasks	Accommodation
	Learning environment is designed to support and facilitate critical thinking	Accommodation
	Encourage testing ideas in discussions against alterative viewpoints and contexts	Accommodation

Table I. (*continued*)

Module sessions	Instructional principles	Cognitive learning concepts and indicators
	Opportunities provided to reflect on both the learning content and process of the unit	Equilibrium
FMA 4		
Submit FMA 4	Test for reinforcement	Accommodation
WEEK 14		
Final exam	Test for reinforcement	Accommodation
Course evaluation		
Complete student evaluation of teacher SET) survey (quantitative component)[a]	Providing an opportunity for altering, modifying and enhancing course content and delivery *vis-à-vis* professional practice requirements	Disequilibrium
Instructor evaluation		
Complete student evaluation of teacher survey (qualitative component)[b]	Providing an opportunity for altering, modifying and enhancing Course content and delivery *vis-à-vis* professional practice requirements	Disequilibrium

Notes: [a]Refer to Appendix 2 IH 201 SY 2015-2016 SET survey; [b]refer to Appendix 3 on qualitative student feedback

Table I.

communicable and non-communicable disease burdens in low and middle income countries. The task required students to deliberate as a group (eight members per group out of five groups) in selecting a particular country that is experiencing a "double burden of disease" and produce a health policy paper highlighting the emerging health issue in a country of choice (Week 4, September 19- September 25, 2015). Presented in Figure 1 are the frequencies of appearance of Group A members who chose the topic on malnutrition among women and children in Bangladesh. This figure does not factor in the time spent doing the activity online or if the deliberations were done external of the

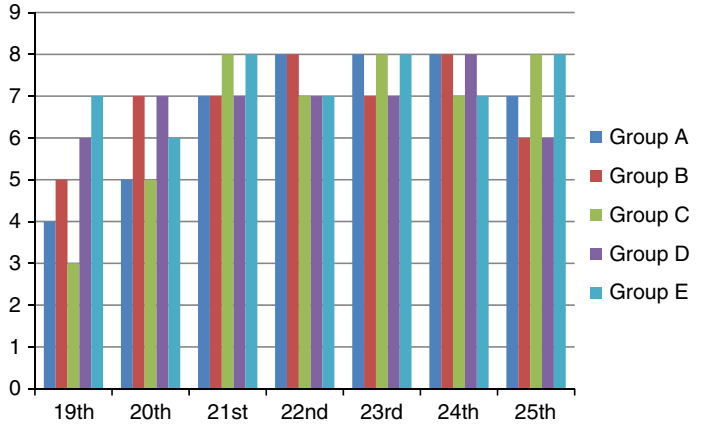

Figure 1.
Frequency of appearance by date, Group A

virtual class. It therefore highlights only the frequency of appearance of students in the virtual classroom on various dates in September, 2015.

From the data presented in Figure 1, students tend to appear more frequently toward the middle and end of the set date for the task. This indicates consistency in undertaking the task assigned collectively. Assessment of students learning outcomes and critical thought in this and other SLDF e-tivities were primarily gauged on the following criteria; that posts provide an engaging basis for further dialogue; that the initial post is made early in the discussion forum to allow for sufficient time for further deliberations from colleagues; submission and additional posts shows the ability of the student to consistently extend dialogues in multiple ways by encouraging and contributing well-supported new/alternative viewpoints, and through the use of probing questions, constructive arguments and critique in response to others' postings and providing relevant additional empirical resources. A separate Forum was created where all the group output was posted to allow for further discussions among students as a peer-review process (equilibrium and disequilibrium). Qualitative comments as highlighted below therefore attest to Gold's (2001) and Roger's (1983) contentions on the abilities of students to assess their own learning needs as peers and where such learning is done best when students are given autonomy:

> Re: Assignment
>
> by RO- Friday, 25 September 2015, 1:11 PM
>
> Hi Vic, I am not the group leader. Mam Weng already assigned Kath to put our inputs as a draft. Kindly help her. Coordinate nalang po sa kanya [with them]. Please consolidate all comments of our groupmates. You can post it in the forum as a word format so that everybody can have the access to edit it. For now, I still have important obligations to do, sorry but I will get back later in the evening and let's finish our assignment before 12mn
>
> RO
>
> Re: Policy Brief_Group 1a
>
> by GB- Saturday, 24 October 2015, 9:04 PM
>
> Congratulations Group 1A for coming up with a very good policy brief. I was observing how you interacted with each other and how you exchanged ideas among yourselves. That was wonderful. Though not everyone participated in the discussion, some of you stood out in the discussions and some showed great leadership. Nice work.

Anecdotally as presented in the data above, engaging in the SLDFs in the IH 201 course aligns with Piaget's (1977) cognitive knowledge category of equilibrium. This form of interactive, collaborative and multidisciplinary learning experience is necessary for transformative learning in line with the following espoused World Health Organisation (WHO) (2013, p. 45) principles deemed important in the design of any inter professional education (IPE)-oriented curricula:

(1) Has relevance to learners' current or future practices.

(2) Uses typical, priority health problems that require inter-professional approaches for their solution.

(3) Inter-professional learning based on work practice.

(4) Learning methods that facilitate interaction between learners from different professions including small group learning. Formats such as case-based and problem-based learning have been shown to be particularly effective.

Student evaluation of the IH 201 course indicates a general agreement that the Course meets their learning expectations (Appendices 2 and 3). From these responses, it comes out that much of the learning a la Piaget's (1977) analytical framework on processes of knowledge production was, or should be, gained through interactive deliberations. From the student feedback, it is subjectively evident that an essence of transformative learning was gained in meeting the above listed WHO recommended IPE principles where learners are able to "construct meaning through sustained communication" through inter-professional learning (Garrison *et al.*, 2001, p. 11). As this was a descriptive qualitative study, there is need for further research to quantitatively assess learning outcomes, e.g. comparative studies such to gauge the effectiveness of enquiry-based transformative learning experiences using small group discussions such as that by Hilvano *et al.* (2014). Doing this may empirically highlight how ODeL-based courses aimed at transformative learning can illuminate student problem solving abilities and critical thinking skills through group tasks (Hilvano *et al.*, 2014).

From a constructivist pedagogical perspective, curriculum or syllabus should be geared toward "solving problems within the context of a person's previous knowledge" (Gold, 2001, p. 40). This is achieved in the online environment by engaging learners in experiential learning with peers and instructors via actual project-based learning accomplished through e-tivities in order to demonstrate applicability in practice (Hilvano *et al.*, 2014; Mastilak, 2012). For the IH 201 course in discussion, the core e-tivities employed included reports, policy briefs, proposals, action plans and iterative essays. A number of studies (Le′gare′ *et al.*, 2015, Blanco *et al.*, 2014) however raise concern over learning objectives in many training programs and curricula that focus overwhelmingly on the lower levels of the taxonomy of cognitive learning, knowledge and comprehension. Ergo, innovative processes to online learning necessitates a pedagogical shift in perspective during which habits of mind become more open, more permeable and better justified (Cranton and Taylor, 2012, p. 3). This I argue is best done "constructively" where transformative learning is achieved through a process of scaffolding (Kass, 2013; Salmon *et al.*, 2010; Salmon, 2002) involving movement from an instructional to constructivist approach via e-tivities or what the WHO recommends, case-based and problem-based learning (WHO, 2013). This form of learning is guided by a pedagogical philosophy that "involves interaction between neutral, cognitive, motivational, affective and social processes" (Azevedo, 2002, p. 31). These occurs when a person, group or larger social unit encounters a perspective that is at odds with the prevailing perspective (Cranton, 2006, p. 2) or disequilibrium as per Piaget's (1977) concept. Indeed the WHO (2013, p. 21) guidelines on transformation and scaling up of health professionals' education and training makes a call "for new approaches in health professionals' education that transform systems and encourage the move away from the traditional focus on tertiary care hospitals and toward initiatives that foster community engagement." I thus reiterate Blanco *et al.*'s (2014) call for health educators to consider such shortcomings if health professionals are to achieve increasing level of skill and function. Doing this requires more critical assessments of transformative learning taxonomies that will in effect enhance the potential of ODeL-based healthcare education and training in offering an alternative approach to health care professionals' education and training through open knowledge systems and thus produce graduates who are more responsive to the evolving health care needs of both local and global populations amid twenty-first century global health challenges.

Conclusion

This paper sought to qualitatively discuss, via a descriptive case study of the course in IH 201 of the International Health Program of UPOU, the means by which transformative education and training in global health can be undertaken through ODeL in the quest for increasing the quality, quantity and relevance of health professionals in the twenty-first century. E-learning is an affordable and credible means to reduce the growing disparity in health between developing and developed countries" and, as such, "may offer a means of extending public health education in deprived areas and developing countries, where access to public health education is limited by lack of teaching facilities and resources" (Angell *et al.*, 2011, p. 552). Ergo, the design, delivery and transformative learner outcomes as illustrated in this case analysis of the IH 201 course aligns with the general literature regarding the alterative solution ODE, and ODeL in particular, offers as "a viable method for increasing the skills of health care workers in low-resource settings. While acknowledging the limitation in the scope of the study, this paper's discussion while supported by empirical literature shows relevance on the transformative learning process in health education and training which can be achieved by engaging students in constructive experiential learning via project-based learning. However more critical assessment of transformative learning outcomes are needed in order to enhance the potential of ODeL-based healthcare education and training in Asia and thus produce graduates who are more responsive to ever growing public health care needs. For future research, there is need to take on board Hilvano *et al.* (2014) proposition for the need to gauge the effectiveness of enquiry-based transformative learning experiences on the following variables: group selection processes, group size, group composition, amount of instructor intervention or consultation and student preferences as to learning styles. Doing this may help in highlighting how online courses aimed at transformative learning can illuminate student understanding and analysis of problem solving, learn critical thinking skills, and in ensuring group tasks of learners (Hilvano *et al.*, 2014).

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Appendix 1. IH 201 International Health and Development Course Syllabus, UPOU

Course outline

Unit 1: Overview of International Health and Development
- Module 1: The Context of International health
- Module 2: The Alma Ata Declaration and social determinants of health

Unit 2: Major Global Health Issues
- Module 3: Non-communicable diseases
- Module 4: Emerging and re-emerging communicable diseases
- Module 5: Women's and Children's Health
- Module 6: Adolescent Health
- Module 7: Aging and Global Health

Unit 3: Health and Development
- Module 8: Health Inequalities and Inequities: a Development Agenda
- Module 9: The Economics of International Health
- Module10: Health in the post-2015 UN development agenda

Unit 4: Strategies for Addressing International Health Challenges
- Module 11: International health policies and systems
- Module 12: International cooperation and partnerships

Appendix 2. Student evaluation of teacher (SET) Semester 1, 2015-2016

Course code: IH 201
Number of students: 91
No of respondents: 14

SECTION		TOTAL MEAN
Part 1	COURSE GUIDE	1.881
	LEARNING RESOURCES	1.927
	LEARNING ACTIVITIES	1.867
	DISCUSSION FORUMS	1.964
	EVALUATION OF STUDENT LEARNING	1.976
	STUDENT SUPPORT	1.786
	COURSE SITE	1.929
Part 2	FACULTY IN-CHARGE	2.095
	Overall Mean	**1.928**

Appendix 3. Student qualitative feedback

For the course in International Health and Development, there were 91 enrolled students, all who were Filipinos. A relatively low rate of student feedback (~8 percent) was received on the course as posted in the main course site as an end of module reflection. These are presented below where initials at the end of statements indicate the coded identities of respondents followed by their occupation and location:

> I am very grateful that I enrolled in this course! I learned a lot and had an amazing learning experience with my classmates especially my groupmates! Thank you Sir Rehal for being a great teacher! D.C. (Filipino Medical Technologist – Al Jubail, Saudi Arabia).

> All good things will come to an end. Indeed, this course has brought me a lot of good things and we already have reached the end of this course. But I learned a lot of new things, interacted with a lot of people from different places, shared a lot of insights and gained a whole lot new of experiences. Thank you Sir for imparting your wisdom to us and for letting us also share the lessons we gained through our discussion forum. I also want to thank my groupmates for the camaraderie we have slowly built through the interactions we have had in our forums. Looking forward to work together with you in the next courses we will have S.L. (Medical Technologist-Philippines).

> I would like to express my sincerest thanks to Prof Rehal and Dr Gen David for the valuable learnings we gained from the course. With all the challenges that I encounter in this course, it added all to my professional growth as health care worker. And to my groupmates, thanks for the great discussion and support for each other. Till the next course! P.C. (Filipino Nurse Inspector-Bahrain School of Royal Medical Services).

> I just want to say that I really enjoyed this course though I must say it is tough. thank you for all of your experiences and knowledge shared through our discussion I've learned a lot from you guys and I hope to hear from you again next semester. Good luck to all of us and God bless! J.A. (Administrative Staff-East Avenue Medical Centre Philippines).

> I love this course. International health has been my passion along with supportive, hospice, and palliative care medicine. It has been my dream to join international health organizations when I was but a child. I promised myself to apply in one of the international health organizations after my residency training, subspecialty training, and masteral course. All in all, I've learned a lot knowledge-wise and attitude-wise in this course E.B.G. (Physician-Philippines).

> At first, I thought I could not make it to the end but I was able to finish the course because I was motivated by you and my classmates, especially my groupmates. They were all great and I learned a lot from them and that's more important to me W.S. (Medical Doctor-Philippines).

Overall, Sir Rehal makes the course interesting with lots of activities such as DF and SLDF making all students interact/debate and in the same time make friends B.R. (Nurse-Jeddah, Saudi Arabia)

I do appreciate that the modules in this course are also related with other DIH subjects that I enrolled in – where supplemental ideas could be learned further R.O. (Inspector for Pharmaceutical manufactures-Philippines).

I think additional FIC, tutor or moderators are needed in order to reduce the number of students in the groupings so that discussions are well-facilitated. Furthermore, other strategies maybe needed to encourage all students to participate in the SLDF (student led discussion forum) so that more learning is gained S.T. (Medical Technologist-Doha, Qatar).

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