

Challenges to Interprofessional Education: will e-Learning be the Magical Stick?

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Purpose: In Egypt, the main challenges to interprofessional education (IPE) implementation are complexity of the required curricular design, the attitudinal barriers between professions, and the needed resources. Action research work was planned and implemented to identify alternative solutions to overcome barriers to IPE in the local Egyptian context.

Methods: -An 8-week e-learning elective course was developed, implemented, and evaluated. A mixed group of 30 nursing and medical students was enrolled voluntarily in the course. Female to male ratio was 3:2. Four faculty members were assigned to manage the course. Based on the EMRO-WHO guidelines, ethics content was selected and organized. A closed Facebook group was created and utilized as the e-learning platform. Facilitated large-group and case-based discussions were the main instructional methods. Scoring of mixed small group assignments was the main assessment tool. Course evaluation was conducted using the Interprofessional Socialization and Valuing Scale (ISVS) and an Online-Course Evaluation Questionnaire (OCEQ).

Results: ISVS results revealed that students' perception of ability, comfort and value in working with others, were all positive. The OCEQ provided additional evidence regarding the satisfaction of students with the Facebook group as a learning platform. Assignment submission rate was 90%. Success rate of small group assignments (scores $\geq 60\%$) was 100%. Response rate to the open online discussions was 63%. Through peer evaluation as well as direct observation of online discussions, there was evidence of distinct contributions by females and by medical students compared to nursing students.

Conclusion: As evidenced by the students' perception and performance, our IPE distance learning experience was valuable. Motivation of medical students as well as females was evident. IPE is a challenging process. The elective approach and using DL can offer solutions. Conducting relevant practical sessions as well as sustainability of this IPE e-learning experience remain key challenges.

Keywords: adult learning, distance education and online learning, cooperative/collaborative learning, teaching/learning strategies

Introduction

Interprofessional education (IPE) is an important and widely used pedagogical approach for preparing students of different health professions to provide collaborative and quality patient care. The idea behind using IPE is that once health care professionals study together they can work together in a cooperative manner with the common goal of providing quality health care to their patients.¹

IPE used to be simply defined as "learning together in order to practice together".² Nowadays, the definition of the Centre for the Advancement of Interprofessional Education (CAIPE) is being more widely accepted. This definition

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indicates that IPE occurs when two or more professions learn with each other in order to establish collaborative and quality care. It includes all learning opportunities in academic or workplace-based settings, before or after qualification.³ IPE occurs when health professionals are educated together in multiprofessional or mixed educational settings. Accordingly, they will learn to work as a team while they are studying. The end result will be effective and efficient health care provision.^{4,5}

IPE implementation can lead to benefits for health care users, students, and professionals. Concerning health care, IPE guards against occurrence of communication failures and “unhelpful protectionism”. For health professions education institutions, IPE can help in the development of the skills needed to operate successfully in teams toward achievement of the institutional goals. Meanwhile, IPE experiences can help students to come across work difficulties and barriers of real life settings.⁶

When trying to refer to theoretical background for IPE, systematic reviews highlighted that few studies directly focused on a particular theoretical framework.⁷ Therefore; the combination of the following teaching methods was suggested when applying IPE courses: exchange-based learning in the form of debates and case studies; action-based learning using problem-based cases; observation-based learning, eg, joint visits to a patient by students from different professions; simulation-based learning, using role-play; practice-based, eg, co-location across professions for placements, E-learning and blended learning, all together with the didactic lectures.⁸

Despite the well-known benefits of IPE, there is evidence of a set of barriers or challenges that jeopardize the implementation of this approach in health professions education. These challenges can be categorized under the following categories: professional boundaries, curriculum, resources, leadership, stereotypes and attitudes, teaching, variety of students, different IPE concepts, enthusiasm, and requirements of accreditation.³

In Egypt, as well as in other countries in the region, IPE faces challenges that have guarded against the general implementation of this teaching approach. Examples are: complexity of curriculum design needed for IPE as well as the attitudinal barriers and distinct identities between professions.⁴ Throughout this study, an action research work was planned and implemented to identify alternative solutions to overcome barriers to IPE in the local Egyptian context. E-learning was applied in this study, and is highly

encouraged by health professions institutions, especially after COVID 19 situation.

Materials and Methods

Course Design

A distance learning (DL) 8-week course was designed and implemented on elective basis. Kern et al (2015) Six-Step Approach for curriculum development was followed to guide the process of course design.⁹

The course was introduced for study as a summer course. A mixed group of 30 nursing and medical students were enrolled voluntarily in the course. Female to male ratio was 3:2. Four faculty members were assigned to manage design, implementation and evaluation of the course and worked voluntarily as well. Based on the Eastern Mediterranean Regional Office (EMRO-WHO) guidelines, ethics content was selected and organized over the schedule of 8 weeks.¹⁰ A closed Facebook group was created and utilized as the e-learning platform. Selection of the Facebook interface was based on exploring the views of the targeted group of students regarding utility, feasibility and acceptability of this medium.

Implementation

Teaching of the content was based on two main instructional methods. The first was by facilitated large-group discussions based on case scenarios. The other method of instruction was a small group discussion of another set of case scenarios addressing complex ethical dilemmas. An example of a case scenario is presented, with questions directed to students stimulating discussion, in [Box 1](#). There were 6 students in each group, nursing and medical students divided equally. Each small group was required to submit a report that includes a solution for the ethical dilemmas. Scoring of these IPE assignments as well as the substantial contributions in the large group discussions were the main assessment tools. Self and peer evaluation with feedback were utilized.

Monitoring and facilitation of the ongoing discussions and giving timely feedback and comments were conducted by the four faculty members around the clock.

To ensure motivation of students, financial rewards in the form of incentives as well as selection of the best performing group and appraising their performance through relevant scholarship activities associated with

Box I Case Scenario with Proposed Questions

Case scenario (for small group assignment)

Time: Up to the midnight of

Nada, a fourth-year student who is doing her obstetrics and gynecology rotation, is spending a day in a university obstetrics clinic. After she has seen several patients and observed a couple of procedures, the attending physician, Dr. Omnia, hands Nada a chart filled with background information and a hand-out listing the information she will need to gather and instructs her, "Nada, please go learn this patient's story and see what kinds of questions she has about the procedure."

The first thing Nada notices when she opens the chart are the words "trisomy 21". She knows well what this means — in addition to her medical training, she has an adult brother with Down syndrome. As she continues to read, she learns that the woman, Fouzia, is 33 years old and is 11 weeks pregnant. Fouzia has had a long battle with infertility because she has mosaic Turner's syndrome. She has had seven miscarriages but has a one-year-old son at home.

At eight weeks gestation, Fouzia had an abdominal ultrasound that showed thickening of the nuchal fold. She subsequently had cell-free fetal DNA testing which indicated she had a high chance of having a child with Down syndrome. Nada wonders what kind of counseling Fouzia received prior to arriving in the obstetric clinic, particularly since she has not had a true diagnostic test for Down syndrome, such as a chorionic villus sample, and there were no notes in her health record from any genetic counseling sessions.

Nada takes a deep breath and knocks on the patient's door. Inside the room, she finds a teary-eyed woman, sitting and holding hands with her husband. When Nada asks Fouzia about her story, she explains, "We were so happy to be pregnant again after having so many miscarriages. It was devastating to learn about the Down syndrome. We just...can't imagine putting that kind of burden on our family."

Nada responds, "I'm sorry to hear that you've been through so much. I hope that we can provide the support you need." She goes on, "Do you feel as though you have received adequate information about Down syndrome?" Fouzia nods, tears streaming down her cheeks; her husband stares at the floor.

Fouzia seems to regard the cell-free DNA test as diagnostic of Down syndrome; this worries Nada, particularly since it seems that she has not received any counseling. She's also concerned that Fouzia's and her husband's decision to abort might not be an informed one. Nada feels some obligation to speak up on behalf of the often-underestimated and undervalued population of people with Down syndrome. She wonders whether to speak to Dr. Omnia and to Fouzia and her husband about her concerns, and she wonders what to say.

In no more than 400 words

- Discuss all the potential options for deciding about this pregnancy.
- Explain the role of autonomy, consenting, unbiased information in decision making regarding this pregnancy.
- What is the proper final decision that should be taken in this case? Based on what?

paper were announced. All these act as effective external motivators.

Course Evaluation

Course evaluation was conducted by two means. First was through using the Interprofessional Socialization and Valuing Scale (ISVS) to evaluate the students' attitudinal changes as a result of their involvement in the interprofessional learning process. Second was the Online-Course Evaluation Questionnaire (OCEQ) to evaluate the students' perceptions related to the utilized online interface.

The Interprofessional Socialization and Valuing Scale (ISVS)

The ISVS is a measure to assess levels of interprofessional socialization in both students and practitioners. Also, this measure can relate this interprofessional socialization to some other constructs like interprofessional collaboration and identity that can be developed as result of engagement in an IPE experience.¹¹

The Online Course Evaluation Questionnaire (OCEQ)

To be context-specific for online learning, the OCEQ was adapted from the Student Course Experience Questionnaire (SCEQ). The OCEQ consists of 7 scales to evaluate effectiveness of teaching, learning materials and activities, goals and standards, volume of work, appropriateness of assessment, engagement with the topic, and quality of blended learning.¹²

Ethical Considerations

Prior to starting the study, ethical approval had been obtained from Suez Canal University Ethics committee. Written informed consent had been given by study participants and the guidelines outlined in the Declaration of Helsinki were also followed.¹³

Enrollment in the course was managed on elective basis. Informed consent was taken from each student.

Students were informed that they had the freedom to withdraw themselves from the course at any time, also, they had been informed that their evaluation results as well

as their thoughts and ideas will remain confidential and not be disclosed under any circumstances.

Results

Results of our experience in the development, implementation, and evaluation of the distance learning IPE ethics course were classified as follows: first are the elements of the designed course like goals, objectives, instructional strategies, and assessment tools (Box 2).

Students' Assessment

Study of the course was based on 8 themes. A group of case scenarios, each addressing an ethical dilemma, was developed and introduced for online discussion by the large group of students enrolled in the course. The response rate of students to the case-based discussions was 63% (100% equals at least a substantial contribution of each student x 8 case-based discussions x 30 students = 240 contributions). Through direct observation of online discussions, there was evidence of distinct

contributions by female students compared to male students and by medical students compared to nursing students (Table 1).

Ninety percent of the required assignments (18 out of 20) were submitted. Around 95% of the submitted assignments received more than the pass mark (6/10), around quarter of these assignments had full marks (Table 2).

The ISVS questionnaire is composed of three scales which are: a) self-perceived ability to work with others, b) value in working with others, and c) comfort in working with others. The mean item scores as shown in Table 3 indicate that three constructs measured by the tool were positively perceived as a consequence of participation in the course.

Open-ended questions were included in a separate section and were then analyzed qualitatively to identify students' perception of challenges encountered during their study in the course.

There, the OCEQ provided additional evidence regarding the satisfaction of students with the Facebook group as

Box 2 Course Objectives and Learning Outcomes.

Goals:

By the end of the course, nursing and medical students should:

1. Be familiar with basic concepts and principles of health bioethics in the context of interprofessional practice.
2. Be able to utilize moral reasoning and analytical thinking skills to make decisions about simple ethical dilemmas.
3. Appreciate collaborative and team-based approach in dealing with ethical dilemmas.

Learning Objectives:

By the end of this course nursing and medical students should be able to:

1. Differentiate between professional ethics and regulations.
2. Discuss the concept of "honor of the healthcare professional".
3. Discuss the ethical bases and duties of healthcare practitioners in relevance to: Autonomy, Confidentiality, Consenting, Practitioner-patient relationship, and End of life care.
4. Discuss ethical backgrounds of: documentation and authentication, financial affairs in the healthcare field, conducting biomedical research, dealing with the emergent conditions in healthcare practice, dealing with emergency situations, dealing with life-threatening and incurable diseases.
5. Value interprofessional education as a means for future efficient interprofessional collaboration.

Note: Data from Cheftel.¹⁸

Table 1 Collective Score of Group Members in the Large Group Discussions

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Total
	10	10	10	10	10	10	10	10	80
Group A	2.2	2.7	3.3	1.7	3.4	2	2.7	2	20
Group B	2.5	2	3.3	0.5	2	2	3.3	2	17.6
Group C	2	0.5	2.7	1.5	2	3	2.8	3.8	18.3
Group D	3.5	3.7	5.5	6	5	4.7	4.3	5.2	40
Group E	4.3	5.7	5.3	4.8	5.5	6.3	5.3	5.3	42.5

Table 2 Small Group Assignments

	Assignment 1	Assignment 2	Assignment 3	Assignment 4	Total
Group A	10	10	10	10	40
Group B	7.5	8	7.5	–	24
Group C	8	8.5	5	–	21.5
Group D	7	10	9	6	32
Group E	8.5	9	9	10	36.5
Group E	8.5	10	8	9.5	36

Table 3 Means and Standard Deviation of the Three Scales of ISVS Questionnaire (Scales Were Rated Out of 7)

Scales	Number of Items	Mean	Standard Deviation
Self-Perceived Ability to Work with Others	9	5.81	0.78
Value in Working with Others	9	5.52	1.2
Comfort in Working with Others	6	5.32	0.79

a learning platform. Overall satisfaction of the students with their first online experience was evident (Mean=4.3 (SD=1.1)) (Table 4).

Regarding gender variation, male to female ratio of main satisfaction was 1:1. Significant difference in satisfaction between medical and nursing students was in favor of the nursing students (Medicine= 3.7 and Nursing= 4.9).

Table 4 Students' Satisfaction with the Online Experience as Well as Their Gender and Affiliation Differences (Overall Satisfaction Was Rated Out of 5)

	Mean (SD)	t-Test	Significance
Overall satisfaction of students with the online course			
• Overall course satisfaction	4.2 (0.83)	NA	NA
Satisfaction of the two genders with the online course			
• Male	4.3 (1.11)	0.0	1.00
• Female	4.3 (0.76)		
Satisfaction of students from the two programs with the online course			
• Medicine	3.7 (0.95)	-2.8	0.03*
• Nursing	4.9 (0.38)		

Note: *Significant.

A set of the challenges has been identified through this experience by the students and their faculty staff members (Box 3).

These challenges were identified by means of qualitative analysis of the students' responses to the open-ended questions included in the different tools for evaluation or by direct feedback from faculty and course coordinators.

Discussion

There are three main pillars of this action research work. The three pillars in order of research priority are: IPE, DL, and Ethics. During the phases of development, implementation and evaluation, emphasis paid to each of the three pillars was proportionate to its research priority.

During implementation, there were multiple obtained inferences on the enthusiasm and motivation of the medical and nursing students enrolled in the course. Examples of these inferences include the high level of attendance (either face-to-face or online), active participation in online discussions, and the assignment submission rate. Only "logging in" to the course through the online interface was not counted as attendance.^{14,15}

Studies have reported key factors for improving working practice among them: learners' motivation, satisfaction, expectation, training and support among.^{16,17}

Course Design

The development of the IPE online course was a rich experience. As the course was conducted collaboratively among experts in the three fields of IPE, DL, and Health Bioethics, this led to more interaction between the three fields as well as exchange of thoughts, ideas, and experience. Experts' opinions have enhanced the final implemented version.

The course document including its plan for implementation was benchmarked to the United Nations Educational, Scientific and Cultural Organization

Box 3 Challenges Identified by the Students, Faculty, and Course Coordinators

1. Distinct identity between nursing and medical students
2. Lack of resources for implementation of IPE. These are mainly:
 - Trained and motivated faculty members, and
 - Time in already crowded medical or nursing curricula.
3. The inability to conduct relevant hands-on sessions through the online teaching.
4. The difficulty in maintaining equal opportunities of interaction for the nursing and medical students.
5. Making the IPE e-learning experience sustainable.

(UNISCO) bioethics core curriculum.^{10,18} Benchmarking was conducted by two Health Professions Education experts who have special expertise in the fields of health ethics as well as distance e-learning. Feedback by the reviewers included recommendations to reduce the content, re-distribute themes of the different weeks as well as having student assessment group assessment rather than individual student assessment. This was in line with theoretical analyses stressing active participation and collaboration among students in promoting the effectiveness of online learning. As in the majority of online courses, still traditional tutor individualized is the primary means for assessing student performance, and collaborative learning is marginalized and not the core focus.^{19,20}

Plans for students' assessment and program evaluation were agreed upon accordingly.

Students' Assessment

Students' assessment in the IPE course was conducted through evaluation and scoring of the submitted group assignments as well as individual student participation in discussions. According to Kearn (2012),²¹ written assignments and online discussion are the main categories of student assessment in e-learning courses. Student groups submitted 90% of the required assignments. All the submitted assignments (100%) exceeded the pass mark (score $\geq 6/10$). Response rate to the open online discussions was 63%. Online courses may be labeled as artificial, however, acceptable levels of satisfaction have been reported with emphasis on the importance of interaction in virtual learning settings.^{20,22}

Moreover, positive correlations between overall interaction and student satisfaction were noted; as interaction levels went up, satisfaction and learning scores tended to go up as well.²² Through peer evaluation as well as direct observation of online discussions, there was evidence of distinct contributions by female students compared to male students and by medical students compared to nursing students.^{8,20}

Course Evaluation

Based on the component analysis of the ISVS, the tool is composed of three subscales which are: a) Self-Perceived Ability to Work with Others, b) Value in Working with Others, and c) Comfort in Working with Others.

The mean item scores of the three different subscales revealed the following: 5.32 for Comfort in Working with others, 5.52 for Value in Working with Others, and 5.81 for Self-Perceived Ability to Work with Others. These inferences indicate that self-perceived ability to work with others occurred to a great extent as a consequence of participation in this course. As indicated by results of the ISVS, students' perception of ability, comfort and value in working with others, were all positive. These are similar to the results of Brown et al (2016) who demonstrated an effectiveness and feasibility of their adopted IPE course.²³

The OCEQ provided additional evidence regarding the satisfaction of students with the Facebook group utilized as the learning platform. Main overall satisfaction of the students with their first online experience was 4.3 (SD=1.1). Male to female ratio related to their satisfaction with course was 1:1. Significant difference in the course satisfaction was evident between medical and nursing students where nursing students looked more satisfied with the course (mean satisfaction of nursing students = 4.9, while medical students = 3.7). Meanwhile, similar studies using OCEQ reported students' satisfaction with the overall learning experience and linked that to staff interaction in course delivery.²⁴

Challenges

The main challenges to this IPE experience included: belonging to a group and distinct identity formation, lack of resources particularly trained and motivated faculty members, and shortage of time in an already crowded curricula. These challenges to IPE can be overcome through utilization of e-learning, redistribution of available

human and financial resources, introducing relevant courses on elective basis, and seeking assistance from volunteer and interested faculty members. Most of these challenges are consistent with those defined by Anderson (2017), who considered that these challenges interfere with implementation of IPE.²⁵

Challenges of using the online teaching experience included the inability to conduct relevant practical and hands-on sessions, also the difficulty in maintaining equal opportunities for contribution and active participation between students of different backgrounds. Similar challenges were identified by both Wang (2006) and Mishra and Bartram (2002). As indicated by these two publications using animation, blended learning, and flipped classrooms can overcome these to challenges.^{26,27}

Sustainability or at least reproducibility of this IPE e-learning experience remains the most important main challenge. It indicates political will and support at the higher university and ministerial levels.

Still, there are limitations of this study such as lack of control group, dependence on volunteering students and staff, the sustainability and generalizability of results.

Future research is needed to explore how to increase sustainability and students' internal motivation in the same contexts.

Conclusion

The IPE online course on health bioethics was a valuable experience to overcome the barriers to implementation of IPE on a wider scale in the local Egyptian context. As evidenced by the students' perception and performance, our IPE distance learning experience was valuable. Motivations of medical students as well as females were evident. IPE is a challenging process. The elective approach and using DL can offer solutions. Conducting relevant practical sessions as well as sustainability of this IPE e-learning experience remain key challenges.

Abbreviations

DL, distance learning; EMRO, Eastern Mediterranean Regional Office; ISVS, Interprofessional Socialization and Valuing Scale; OCEQ, Online-Course Evaluation Questionnaire; IPE, inter professional education; UNISCO, United Nations Educational, Scientific and Cultural Organization; WHO, World Health Organization.

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