Readiness for inter-professional education at Health sciences: A study of educational technology prespectives

Soe Soe Aye[1], Asia Metropolitan University - Johor Bahru, Faculty of Medicine, Johor Bahru , Malaysia
https://orcid.org/0000-0001-7528-6056

Marzo Roy Rillera, Asia Metropolitan University - Johor Bahru, Faculty of Medicine, Johor Bahru , Malaysia
https://orcid.org/0000-0001-9414-4010

Abstract

Background: Interprofessional Education (IPE), provides an integrative and rewarding learning platform for different healthcare professions to engage with each other in a cooperative basis to ultimately improve healthcare services for patients. Throughout the years, IPE has established itself as an indispensible tool in cultivating the necessary skills, mindset, and understanding to enhance interprofessional collaboration among healthcare providers. That being said, as with many other educational approaches, the success of IPE hinges on the readiness of healthcare professions students to learn and apply the concept; and yet, despite having been readily explored in numerous Western institutions, such readiness among healthcare students in Asian universities remains largely unknown. *Methods:* We measured attitudes related to interprofessional education & collaboration using a questionnaire called Readiness for Interprofessional Learning Scale (RIPLS). A total of 158 students from three faculties of health sciences at Asia Metropolitan University participated in this study. Cumulative result, as well as results from individual faculties were analyzed using Descriptive and non-parametric statistics. *Results:* Medical students overall, reported a higher rating for the perceived benefits of working together to solve patient problems compared to other students from other health sciences faculties. They are more receptive to working with other students from different healthcare professions in small-team projects and also seem to value the importance of mutual learning when dealing with patients' problems. On the other hand, nursing students were more uncertain of how they will fit into a cross-disciplinary team in a professional capacity and felt the need to acquire much more knowledge and skills when compared to students from other health sciences faculties. The total RIPLS score among all three faculties of health sciences at Asia Metropolitan University was in the high range.

Conclusion: Students from three faculties of health sciences offered at Asia Metropolitan University namely Faculty of Medicine, Faculty of Healthcare Management, and Faculty of Nursing, were deemed IPE ready.

Recommendations: The university needs to consider how to integrate IPE into the curricula, define learning outcomes and/ or competencies, develop and utilize the 4-dimensional curriculum development blueprint in line with health professional accreditation standards to promote collaboration and competence among all students ,whereby upon graduation, they as healthcare professionals, will in turn, optimize health services, strengthen health systems, and improve health outcomes.

Keywords: four dimensional curriculum;inter-professionaleducation; inter-professional learning; medical education;

[1]ADDRESS FOR CORRESPONDENCE: Soe Soe Aye, Faculty of Medicine, Asia Metropolitan University, Johor Bahru, Malaysia
Email address; profsoe@amu.edu.my / Tel:+60126101538

1. Introduction

The Interprofessional Education (IPE) approach in healthcare training, is essential in enabling healthcare professionals to deliver high quality health services to patients (Buring, 2009). In 2010, the World Health Organization (WHO) stated that IPE is an experience that "occurs when students from two or more professions learn about, from, and with each other".This engagement between healthcare professions cultivates collaboration and improve the quality of healthcare delivered to patients.(WHO,2010).

1.1 Theoretical perpectives of educational technology

Educational technology is the effective use of technological tools in learning. Learning can occur in or out of the classroom. It can be self-paced, asynchronous learning or may be instructor-led, synchronous learning. There are many updated trends in Educational Technology

1. Collaborative Learning. In a classroom learning model, teachers encourage collaboration by assigning group activities and tasks. This collaborative learning approach helps students to interact with their peers and build their interpersonal skills. 2. Learning Outside the Classroom Environment. Mobile-based devices have taken learning outside of the classroom. With mLearning and eLearning, students can learn at their own pace and time. 3. Social Media in Learning. The teachers have found a way to utilize this trend and turn it into a powerful tool for enhancing the learning process. 4. Interactivity in Classroom Bringing technology into the classroom has made classrooms lively and interactive. 5. Data Management & Analytics. Teachers can now have complete analytics of a student's performance, such as the number of tests attempted, chapters completed etc. 6. Immersive Learning with AR and VR -with the introduction of augmented realityand virtual reality into the education system, learning has become much more immersive than traditional methods. 7. Gamification in Education This trend has been gaining popularity for the simple reason that it increases student engagement. 8. Online Data and Cybersecurity The need for data security is at an all-time high. While cloud storage has become the norm these days, it could prove disastrous at times.

1.2*Education technology link with IPE*

 In IPE there are many initiatives taken where technology is a crucial part of the learning process. A core concern of IPE however is forming professional identities in a way that is open to collaboration with others in the interest of providing care.(Barr,2005)

Current technology practices in IPE comprise eLearning modules on collaborative practice skills, reusable learning objects centred towards concepts, and real life cases and a creative patient journeys (CIPE 2009, Jonsson et al 2006) as well as technology that connects people in virtual communities. However to be beneficial for practitioners and patients, introduction of technology in IPE needs to be driven more by everyday challenges in education and practice. These challenges consist of answering how technology can contribute in core areas of IPE: values, communications and social processes.To improve IPE there is need for reflections on how today and tomorrow's technology can contribute.

1.3 Current State of Research

There have been numerous IPE systematic reviews conducted over the years. (Cooper H, et al., 2001; Hammick M, etal., 2007; Reeves S, et al., 2008). A synthesis review of these 6 reviews compiled and analyzed over 200 individual IPE studies in the last 30 years. IPE studies that were included in these 6 reviews differ in their methodological characteristics and have also reported a wide range of IPE associated outcomes, yet they share a common definition forIPE (" two or more professions learning with, from and about each other to improve collaboration and the quality of care").

In the last three decades, IPE has played an ever-increasing role in the global improvement of health care services and outcomes. (WHO 1976; WHO 2010); And in the last ten years, IPE has been a particular focus of much global research, policymaking, and regulatory undertaking. (Institute of Medicine, 2013). The reason behind such global demand for IPE, stems from 5 core factors: (1) A coordinated interdisciplinary effort is required to address patients' health and social care needs which are inherently complex and multi-dimensional (Institute of Medicine, 2013); (2) Research showing the importance of effective cooperation between health care providers from different disciplines to deliver the best possible outcome for patients (Barr H et al, 2005); (3) Studies in North America, showing how communication failure scan have detrimental and sometimes fatal effect on patients' health (Williams RG. et. al., 2007; Brock D. et al., 2013); (4) Policy documents supportive of improving cross-functional collaboration skills through the application of IPE (The Interprofessional Curriculum Renewal Consortium Sydney, 2013 & Interprofessional Education Collaborative Expert Panel, Washington (DC) 2011); (5) World Health Organization's reinforced commitment to IPE (WHO, 2010).

Numerous studies have also been conducted to determine the most effective time to implement IPE. One study suggested that IPE help diminish the effects of negative professional culture such as hostile stereo typing when delivered in the first year of a pre-qualification program (Barr H et al., 2005). In contrast, some studies have suggested that the effectiveness of IPE is more apparent when delivered post-qualification, because the parties involved will have possessed a better understanding of their professional role and responsibilities. Other studies, namely Rees D et al., 2007 and Wilhelmsson M et al., 2009 have also presented some compelling evidence about the effects of Faculty Development and Organizational factors on IPE.

Likewise, studies on the readiness for IPE have been a subject of scrutiny in the global health care community these past few decades. Most Notably, (1) the effectiveness of an interprofessional education program using team-based learning for medical students: a randomized controlled trial (Hamada S et al., 2019) in which they concluded that learning in multi-professional groups enhanced medical students' level of readiness for team-based interprofessional learning and (2) Readiness for interprofessional learning among health care professional students (Talwalkar JS, 2016) in which they concluded that important differences in baseline readiness emerged but noted that the findings are different from those studies done outside the United States.

1.4 Gaps in research related to IPE

Although IPE has been a subject of extensive research over the years, a wide range of gaps still invariably persist. One such example revolves around how to ensure future IPE research studies lean towards meaningful research linking IPE interventions with sustained changes in practice and patient outcomes. Other gaps include methodological limitations in proposed studies; effective planning and implementation in relation to developing collaborative competencies that can positively affect the delivery of patient care and health outcomes. Another one involves critical knowledge gaps that exist around how management, leadership, and teamwork procedures can bring together the know-how from different disciplines and make cross-disciplinary research more efficient. Ultimately, it is necessary to keep promoting global health related cross-disciplinary research among academic institutions, individual researchers, research team leaders, and research sponsorsto address these gaps (Ding Y, Pulford J, Bates I, 2020).

Aside from the more commonly discussed challenges facing our global healthcare systems such as rapidly aging population, multidimensional health issues, and chronic illnesses; A major but oftenly overlooked is the issue of the quality of education for health professionals. In 2010, the Lancet Commission deemed the current education approach inadequate to prepare graduates of various health professions in tackling modern health challenges worldwide, the rigid and antiquated nature of the

curricula offered by many health professions institutions today, was largely to blame for this phenomenon. A study by Lennon-Dearing et al, (2009) further stated that each discipline has historically been too focused on themselves, they disregard the value of interprofessional interactions. As such, a collaborative education model like IPE, that nurtures team-centered mentality and robust communication skills among healthcare providers is desperately needed, if we are to address this issue.

Despite being popular, IPE is by no means a recent phenomenon. A 1969 paper entitled "Interprofessional Education in the Health Sciences" stated that limited human resources are woefully wasted by health professionals who inappropriately utilize their talents. Evidence of poor communication, isolation, and segmentation between healthcare providers were also reported. More recently, an IPE committee on health sciences was created to promote and experiment with interprofessional education programs, as well as give recommendations concerning the how and what students should learn together within the framework of IPE [Gilbert GH, 2010].

In conclusion, there is a pressing need to redesign our health professions curricula to accommodate interprofessional and systemic approach into training. IPE creates training synergies across healthcare professions and equips students with the collaborative skills necessary for today's complex healthcare environment.

1.5 Purpose of the study

This study aims to determine IPE readiness of students from three faculties of health sciences offered at Asia Metropolitan University namely Faculty of Medicine, Faculty of Healthcare Management, and Faculty of Nursing.

2. Methodology

We obtained ethical and research approval for this study before data collection and utilized convenience sampling method to pick the sample population, recruiting a total of 158 respondents. Our study fulfilled the required minimum sample size for a descriptive study (sample size of 10 to 20% of the total population). We collected data through questionnaires called Readiness for Interprofessional Learning Scale (RIPLS). The study was conducted from June to December 2019.

Students who are willing to participate in this study were given the informed consent form to sign as well as the questionnaire to fill in, approximately 15 to 20 minutes is required to complete all these tasks. To maximize accuracy, our researchers were present in close proximity to the respondents at all times to clarify and answer any questions that might arise during the session. We then employ quantitative assessment, specifically descriptive statistical distribution, to analyze the data that measure students' perceptions of IPE readiness. Fischer Exact test was used to analyze RIPLS items, while ANOVA test was used to compare the group means among faculties.

2.1 Study instrument

There are two parts to the questionnaire used in this study. The first part, contains demographic data, including age, sex, ethnicity, religion, and the faculty to which the respondent belongs.The second part, contains the RIPLS, or the Readiness for Interprofessional Learning Scale (McFadyen, 2005), with 4 subscales (as shown in Table 3) and a total of 19 items (as shown in Table 2).

Like the 5-point Likert scale, the RIPLS questionnaire also includes five responses that correlates directly with a respondent's level of agreement or disagreement, with a higher score indicative of a stronger agreement and vice versa. High scores on the subscales involving Teamwork and Collaboration and Positive Professional Identity are indicative of the respondent's agreement on the importance of

working together with other healthcare professionals and the benefits of inter-disciplinary sharing of knowledge and experience. Conversely, a high score on the Negative Professional Identity subscale indicates disagreement with collaborative learning among health professionals, while a high score on the Roles and Responsibilities subscales indicates a respondent's poor understanding of their own professional role, as well as the roles of others. The content validity index stands at 0.916 with a Cronbach's alpha of 0.86.

2.2 Data analysis

IBM SPSS Version 22 was used for statistical analysis. Based on the valid RIPLS, we performed a Fisher exact test, non-parametric test to measure association based on factorial formula. This is an alternative test in cases where chi-square test is made invalid due to low expected frequencies. One way ANOVA was used to compare three or more group means.

3. Results

A total of 158 respondents were recruited for this study. Respondents were mainly female (80.4%), Indian (38.6%), Hindu (37.3%), and nursing students (46.2%), as shown in Table 1.

Table 1: Sociodemographic Characteristics of the Respondents

Characteristics	Frequency n =158	Percentage (%)
Age		
Mean = 19.44 years		
Gender		
• Male	31	19.6
• Female	127	80.4
Ethnicity		
• Malay	51	32.3
• Chinese	16	10.1
• Indian	61	38.6
• Others	30	19.0
Religion		
• Islam	58	36.7
• Hindu	59	37.3
• Buddhist	21	13.3
• Christian	17	10.8
• Others	3	1.9
Faculty		
• Nursing	73	46.2
• Medicine	57	36.1
• Healthcare Management	28	17.7

Table 2 summarizes respondents' responses to RIPLS items of the questionnaire. Medical students overall, reported a higher rating for the perceived benefits of working together to solve patient problems compared to other students from other health sciences faculties. They are more receptive to working with other students from different healthcare professions in small-team projects and also seem to value the importance of mutual learning when dealing with patients' problems.

On the other hand, nursing students were more uncertain of how they will fit into a cross-disciplinary team in a professional capacity and felt the need to acquire much more knowledge and skills when compared to students from other health sciences faculties.

Table 2: Respondents'Responses to RIPLS Items(Fischer Exact Test)

No	Statement	Faculty (n=158)					p-value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	Learning with other students will help me become a more effective member of a health care team	2	0	17	89	50	0.155
2	Patients would ultimately benefit if health care students worked together to solve patient problems	0	0	18	86	54	***0.050**
3	Shared learning with other health care students will increase my ability to understand clinical problems	0	0	14	74	70	0.212
4	Learning with health care students before qualification would improve relationships after qualification	0	2	35	72	49	0.126
5	Communications skills should be learned with other health care students	1	1	25	75	56	0.660
6	Shared learning will help me to think positively about other health care professionals	0	1	16	78	63	0.197
7	For small-group learning to work, students need to trust and respect each other	0	1	5	51	101	0.181
8	Team-working skills are essential for all health care students to learn	1	1	10	65	81	0.159
9	Shared learning will help me to understand my own limitations	3	1	14	91	49	***0.018**
10	I don't want to waste my time learning with other health care students	0	3	17	72	66	0.085
11	It is not necessary for undergraduate health care students to learn together	4	7	39	60	48	0.718
12	Clinical problem-solving skills can only be learnt with students from my own department/ school / organisation	29	47	50	26	6	0.107
13	Shared learning with other health care students will help me to communicate better with patients and other professionals	0	3	19	74	62	0.399
14	I would welcome the opportunity to work on small-group projects with other health care students	0	4	29	75	50	***0.029**

15	Shared learning will help me to clarify the nature of patients' problems	0	0	26	81	51	***0.028**
16	Shared learning before qualification will help me become a better team worker	1	1	24	82	50	0.108
17	The function of nurses and therapists is mainly to provide support for doctors	2	17	43	62	34	0.163
18	I am not sure what my professional role will be	59	40	31	23	5	***0.002**
19	I have to acquire much more knowledge and skills than other health care students	8	14	59	45	32	***0.017**

*p-value of <0.05

Table 3 shows the differences in readiness for IPE among respondents respective of their faculties, expressed through the mean value of total RIPLS scores as well as scores of its subscales. Our analysis found no statistically significant mean score differences among faculties. This outcome indicated an equal level of readiness for IPE among different faculties and with total RIPLS scores ranging from 83.34 to 84.56; we can conclude that generally speaking, students were ready for IPE.

Table 3: RIPLS p-value Scores in Each of the ThreeFaculties(ANOVA test)

RIPLS ITEM/subscale	*p-value*scores	Nursing	Medicine	Healthcare Management
		Mean(SD)	Mean(SD)	Mean(SD)
Subscale 1: Teamwork and collaboration	0.459	4.73 (0.36)	4.81(0.29)	4.76 (0. 33)
Subscale 2: Negative Professional Identity	0.259	4.19 (0.28)	4.22 (0.34)	4.17 (0.35)
Subscale 3: Positive Professional Identity	0.200	4.26 (0.45)	4.31(0.37)	4.25(0.40)
Subscale 4: Roles and Responsibilities	0.263	3.72(0.30)	3.79 (0.33)	3.70 (0.28)
Total RIPLS Score		83.34	84.56	83.45

3.1   Discussion

A cross-disciplinary oriented health care system approach, especially in terms of communication and team-work is crucial to ensure efficient and effective delivery of healthcare services. The determination of readiness for IPE helps facilitate and encourage integration of IPE into the current curricula. Our current study showed readiness for interprofessional learning within all faculties and benefits from the absence of a multi-site conflict, which makes it feasible for the design, development, and

utilization of the 4-dimensional curriculum which highlights on the following: The first dimension a s k "what is this curriculum for?", "What is the professional and scope that it aims to prepare students for, now and in the future?". The second dimension considers the necessary knowledge, skills and capabilities needed to define competency in a particular area. The third dimension looks at how to deliver the curriculum through the practice of teaching, learning, and evaluation. And the fourth dimension focuses on frequently ignored aspects of how cultural norms and practices, institutional protocols, procedures, and, inevitably, the politics of local institutions shapes curricula at the local level (Buring S.M, Bhushan A, 2009).

4. CONCLUSION

The results of our study demonstrated the apparent readiness of students from the three health sciences faculties for IPE. That being said, the integration of IPE at numerous institutions remains in its nascent stages. Expanding opportunities for IPE that bridges both academic and practice environments is key and can be facilitated through interactive teaching methods embracing partnerships where the fundamentals and state-of-the-art practices of IPE are seamlessly incorporated within existing policies, plans, and evaluation of outcomes in the clinical setting. Apart from creative scheduling coordination, IPE requires a buy-in among faculties' administrators above all else. IPE tends to develop most favorably in programs whose leadership endorses and represents the desired change. Therefore, it is critical to actively nurture administrative enthusiasm in IPE at our university.

4.1 Recommendations

The university needs to consider how to integrate IPE into their curricula in line with health professional accreditation standards. We recommend that the learning outcomes, competencies, and all the other components be developed and implemented according to the 4-dimensional curriculum development blueprint.

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