Original research

A study to determine the educational objectives and outcomes for pre-registration Diploma nursing program: A modified Delphi

Katherine Tan[a], Mei Chan Chong[a],*, Li Ping Wong[b]

[a] Department of Nursing Science, Faculty of Medicine, University of Malaya, 50603, Kuala Lumpur, Malaysia
[b] Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, 50603, Kuala Lumpur, Malaysia

1. Introduction

Institutions, schools and colleges which provide nursing training programs are critically reviewing their curriculum to ensure their program of studies will equip future nurses with the competencies to adapt and respond effectively to the challenging 21st century healthcare environment and to overcome the preparation-practice gap (Slaikeu, 2011; Meyer et al., 2017; Khan et al., 2015; Fawaz et al., 2018). Hickerson et al. (2016, p.17) referred to the preparation-practice gap as *"the deficits in knowledge and skills that novice nurses may demonstrate on entry into the clinical setting"*. Employers will seek nurses who have knowledge, skills and attitudes that are aligned with the requirements of their practice environments, can work effectively in inter-professional teams to provide traditional nursing services and other needed services (The National Advisory Council on Nurse Education and Practice, 2010).

As highlighted by Wolff et al. (2010), educational preparation becomes a primary concern as nurse graduates were expected to be "ready for practice" (p.187) and "hit the ground running" (p.187) upon completion of their nursing course. According to Walker and Campbell (2013), work readiness not only entails having a generalist foundation with some job-specific capabilities and competencies but also possessing generic industry related skills such as: teamwork, time management, communication skills and emotional intelligence.

The inadequate preparedness of new nurses could lead to work-related stress, influencing many to quit the profession (Wu et al., 2012). Nursing shortages is still a concern in Asia as discussed in the recent International Council of Nurses Forum [ICN], (2018), thus Asian countries are urged to strengthen their nurse retention strategies and to improve on the training of in-country nurses to address this concern.

However, preparing nurse graduates ready for the workplace is still a challenge primarily due to the non-alignment of theoretical knowledge and clinical application (Kandasamy and Vijayakumar, 2010; Bvumbwe, 2016; Bennett et al., 2017; Ajani and Moez, 2011) and the lack of collaboration and differences in expectation between nursing education and nursing practice on the professional competencies and educational outcomes of novice nurses (Numminen et al., 2014;

Bjerknes and Bjork, 2012). Stronger collaboration between nursing education and nursing practice and redesigning the way we teach and train our future nurses can facilitate in narrowing the preparation-practice gap (Bennett et al., 2017; Meyer et al., 2017; Slaikeu, 2011).

Therefore, the move towards outcome-based education (OBE), a learner-centred educational philosophy is an appealing and powerful approach in the designing of nursing curriculum (Singh and Ramya, 2011). In OBE, the primary aim is to achieve intended learning outcomes thus the identification of outcomes is critical and it is the initial step of the curriculum development process (Hesook Suzie, 2012; Singh and Ramya, 2011).

1.1. Background of the study

Studies have found that nurse administrators and nurses in clinical practice were not confident with the capabilities of the new nurse graduates as they entered the nursing profession (Bennett et al., 2017; Numminen et al., 2014) and they were considered simply not ready for all aspects of their job (Hickerson et al., 2016). Similarly, in Malaysia, the preparation-practice gap remains wide with the constant criticism of inadequately prepared nurse graduates from nursing administrators and senior nurses in practice. In addition, the alarming number of 8,000 unemployed Diploma nurse graduate reported in the year 2010 were mainly due to the low quality of nurses, their lack of nursing skills and training (The Star Online, 2012) and poor language proficiency (Arumugam et al., 2014). These reports had caused a great concern that needed remedial actions. Although several ad-hoc solutions were carried out, an overdue paradigm shift of nursing education was much more required.

For many years nursing education in Malaysia has remained teacher-centred, didactic in its approach with content-saturated curriculum. (Task Force Committee for Nursing Education, 2010). The traditional nursing curriculum have failed to prepare nurses for the practice of 21st century healthcare, thus a call for radical transformation for pre-licensure nursing education was needed (Benner et al., 2010; Institute of Medicine [IOM], 2011). Furthermore, traditional nursing curriculum could not appeal to the learning styles of the current

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* Corresponding author.
E-mail addresses: katherine74@siswa.um.edu.my, kathtan74@gmail.com (K. Tan), mcchong@um.edu.my (M.C. Chong), wonglp@um.edu.my (L.P. Wong).
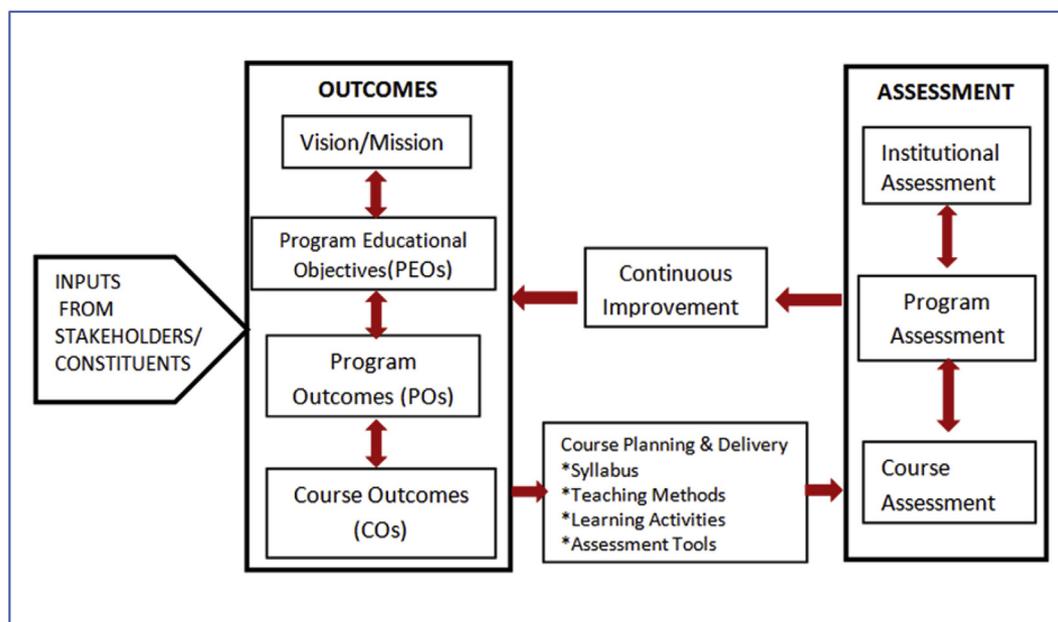
Fig. 1. Obe framework (Oreta and Roxas, 2013).

Millennium nursing students who prefer active teaching and learning approaches (Chung and Fitzsimons, 2013; Battersby, 2017).

It was timely that the Malaysian Nursing Board (MNB) had mandated all nursing programs to be restructured according to the OBE framework and accreditation guidelines (Standard Criteria for Approval/Accreditation of Nursing Programs, 2018). Embracing OBE concept in curriculum development involves designing backwards the curriculum, starting with clarifying the outcomes that students are to achieve followed by aligning the curriculum, instructions, and assessment (Singh and Ramya, 2011) as illustrated in Fig. 1. Clearly stated educational outcomes is critical as it helps students understand what is expected of them (Ossenberg et al., 2015) and the competencies of student nurses improved when predetermined learning outcomes were made explicit to them at the starting of a course (Tan et al., 2018). Literatures on the adoption of outcome-based approach in nursing education were mostly centred on the exploration of the concept itself (Wittmann-Price and Fasolka, 2010; Singh and Ramya, 2011; Hesook Suzie, 2012), on the evaluation of achieving intended learning outcomes or competencies (Fan et al., 2015; Valizadeh et al., 2009), on effectiveness of OBE (Tan et al., 2018) and on describing and comparing educational outcome indicators for nursing (Oh et al., 2011; Lee et al., 2011). However, the process of reaching consensus on educational outcomes for basic nursing education was not explicitly described in published literature.

Therefore, the aim of this paper is to present, discuss and draw important implications from the findings of a Modified Delphi study that seeks the consensus of a panel of experts in determining the required Program Educational Objectives (PEOs) and Program Learning Outcomes (PLOs) of the pre-registration (Diploma) in Nursing Program in Malaysia. In this study, PEOs are broad statements that describe the nursing career and professional accomplishments that the Diploma program is preparing nurse graduates to attain within a few years after graduation. It encompasses employability attributes, specific goals consistent with the mission and vision of the institution, contains the eight Malaysian Qualification Framework (MQF) Learning Domains (Fig. 2) and is responsive to the expressed opinions of program stakeholders. PEOs are not directly measurable but serve as an aim of what nurse graduates will be many years after graduation. Comparatively, PLOs are narrow outcome statements that describe the specific knowledge, skills, abilities and values that nursing students are expected to know and be able to perform or attain by the time they

complete their nursing Diploma program. It can be directly measured but are usually indirectly measured through achievement of outcomes at the lesson and course level.

2. Research methodology

2.1. Study design

This study employed a descriptive survey design using the Modified Delphi technique. The Delphi technique is useful to identify group consensus of professional opinion on a given area of interest where a previous consensus does not exist (Keeney et al., 2006) and it can be used in nursing education to extract the "tacit" knowledge of experts (Foth et al., 2016, p.119).

2.2. Delphi expert panel selection

Expert panel were purposefully selected by the first two authors to represent key stakeholders' groups involved in nursing education particularly the Diploma in Nursing program. This included Nurse Academicians from private institutions – 3 members; Nurse Academicians from public institutions – 3 members; Head of Diploma nursing program – 3 members; Director/Head of Nursing from private hospital – 3 members; Nurse Managers from private hospitals – 3 members; Matrons from public hospitals – 3 members; Nursing Board of Malaysia – 3 members; Nurses Association/Council members- 3 members; medical practitioners – 3 members and recent nurse graduates – 3 members. The 30 targeted expert panel was selected from major public and private nursing institutions and hospitals in the urban central region of the capital city of Malaysia. Majority of the experts are policymakers for the national nursing education.

The selected experts were each given a letter of invitation either by post, by hand or via email to participate in the study with the aims of the study explained and the initial questionnaire for Delphi Round 1 attached. Informed consent was obtained at the start of the Delphi Round. Those who did not agree to participate were given the opportunity to nominate another expert whom they recommend could answer the aims of the study.

The selection of the experts was based on the following inclusion criteria: Is willing to participate in all Rounds of the Delphi study; possess more than 10 years of working experience in their respective
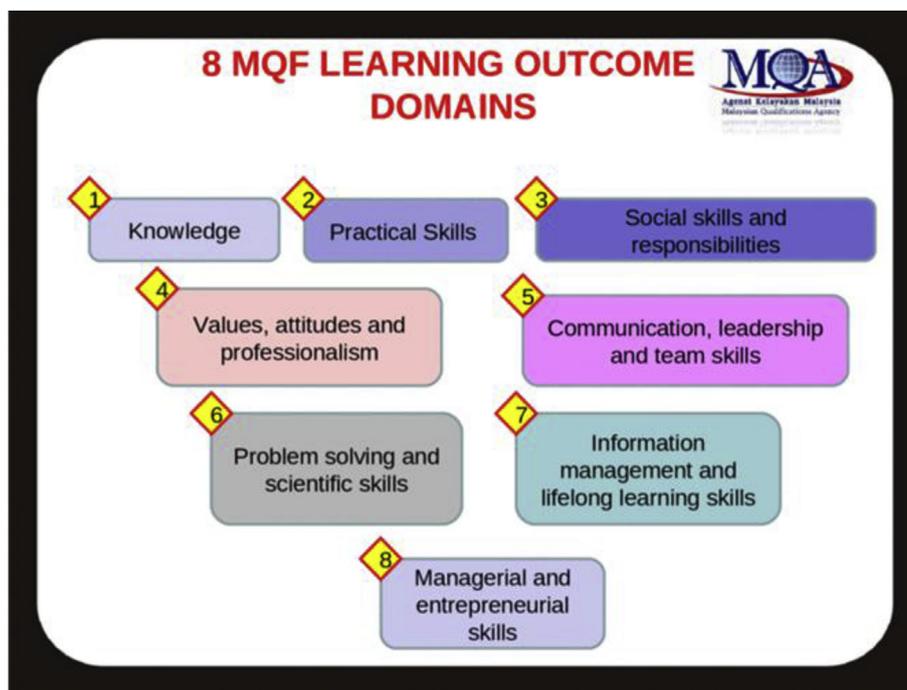
Fig. 2. Malaysian qualification framework (MQF) learning outcome domains (2011).

field except for the recent nurse graduates; must be involved in the nursing Diploma Program and has the knowledge of OBE except for the recent nurse graduates. Although ex-nurse graduates may not be experts in their opinions of nursing education, their past experiences as student nurses would give valuable insights into the desired outcomes for a Diploma in Nursing program (Marshall et al., 2007). Medical practitioners were selected as they work in close partnership with nurses and were involved in nursing education, thus their opinion and expectation of nurses were important.

The researchers' role was to select the panel members, send out Delphi questionnaire, analyzing and consolidating consensus and feedback of the data. The panel members had given their consensus independently and each panelist remained anonymous one with another. Participation was voluntary and informed consent was obtained without any incentive given to the panel members.

2.3. Construction of Delphi Round 1 questionnaire

The initial Round 1 questionnaire was developed by the researchers through a wide range of literature search as opposed to the qualitative approach in the classic Delphi (Hsu and Sandford, 2007). Several sources including academic nursing literature, existing Program Objectives and Outcomes from various public and private institutes of nursing in Malaysia, international literature on the current trends in nursing education, websites of local and international nursing governing bodies and accreditation agencies (Nursing Board Malaysia, National League for Nursing, Malaysian Qualification Agency) were searched.

The results of this initial efforts were a questionnaire consisting of ten PEO and 36 PLO statements for the Diploma in Nursing Program in Malaysia. Spaces were provided for any comments and additional suggestions. The final Round 1 questionnaire was checked for its' face and content validity by the researchers and pilot tested by three Nurse Tutors who were not included as expert panel for the actual study. The initial questionnaire has the appropriate level of detail and validity, instructions were clear, thus no revision was needed.

2.4. Delphi data collection

2.4.1. Delphi Round 1

The data were collected from January 2017 to August 2017 via 2 Rounds of Delphi iteration. The selected experts were individually given a letter of consent to participate in all Rounds of iteration and a cover letter to explain on the aims and the significance of the study. The Round 1 questionnaires were sent to the selected panel of experts via e-mail and by hand and they were given one month to complete. They were required to rate their level of agreement on each of the PEO and PLO list of statements on a 5 point Likert Scale (1 – Strongly disagree; 2-Disagree; 3- Neutral; 4- Agree and 5- Strongly agree) and give comments and to suggest additional PEOs and PLOs. The researcher sent out reminders through email, phone call and met with the experts to enhance timely return of responses. However, the return of responses took an additional two months. Data were analysed and discussed by the researchers after the completion of the first Delphi Round.

2.4.2. Delphi Round 2

The results of the first Delphi Round were returned to all Delphi Round 1 expert panel (N = 20) with a 100% response rate. They were given analysis of the percentage of the overall level of agreement for each of the PEO and PLO statements, a cover letter explaining experts' general comments on how to improve on the formulation of statements and the reasons on why some of the statements were deleted or should be combined. An improved list of PEOs and PLOs was formulated and together with the input based on Round 1, the same panel of experts was invited to rate again their level of agreement.

2.4.3. Data analysis

Descriptive analysis of scores on the level of agreement for each of the PEO and PLO statements was carried out and comments by experts were grouped into the same categories. After each of the Delphi Rounds, measures of central tendencies (means, medians, modes) and percent agreement were calculated. Data from Round 1 and Round 2 were converted into dichotomous variables respectively, where scores of 1 and 2 were combined and categorized as 'disagree' and scores of 4 and 5 were combined to form 'agree'. Scores of 3 where decision is

'neutral' were excluded from data analysis.

Consensus was considered reached when 75% or more of the panel of experts rated 'agree' or 'disagree' for each of the statements and the median score of 4 and larger was attained (Diamond et al., 2014; Foth et al., 2016). However, when the level of agreement fell below the predetermined 75% percent agreement, the researchers considered the comments given by the panellist to justify their ratings. Subsequently, the statements were reformulated and presented in the next Round. The Delphi iteration will stop when there is overall high level of consensus achievement as pre-determined and there is saturation of comments in each round (Foth et al., 2016).

3. Results

A total of 30 potential experts who met the inclusion criteria were invited and 22 (response rate of 73%) responded to an interest in participating in all the Rounds of the study. However, out of the 22 responses, two of the responses were incomplete. Thus, the final number of complete responses for Delphi Round 1 was 20 participants (response rate of 67%). The same 20 panel of experts also participated in Round 2 which made up a response rate of 100%. The demographic details observed a considerable balance representation of nurse academicians (40%) and nurse administrators and in clinical practice (35%). The detailed demographic characteristics of the panel members is presented in Table 1.

3.1. Round 1 Delphi

Based on the results as shown in Table 2, out of the ten PEO statements, four PEO statements (PEO1, PEO2, PEO 5 and PEO 9) achieved 75% or more of percent agreement with the mean scores ranging from 3.45 (SD 1.39) to 4.40 (SD 0.68), although the median scores were 4 and above. Experts' comments were summarized into three main categories: 1) Action verb must be measurable or achievable, 2) objectives must be realistic and 3) to combine similar PEOs under the same MQF Learning Domains. In PEO3 which achieved 65% consensus, four (20%) of the experts suggested to remove the word "*God*" as …. … "*some individuals may not believe in the existence of God*". PEO 8 which mentioned "*altruism*" and loyalty to the nursing profession obtained the lowest level of agreement (55%) among expert panelists. The panelists were concerned on how to measure altruism and that it cannot be achieved, thus to substitute "*altruism*" with words such as "nursing ethics" and "values" and to combine with PEO1.

A total of 26 (72%) PLO statements achieved more than 75% agreement with the mean scores ranging from 3.80 (SD 0.83) to 4.40 (SD 0.75). A total of 16 PLO statements achieved more than 80% agreement and 10 PLO statements achieved 75% level of agreement. The remaining 10 (28%) PLO statements with the mean scores ranging from 3.70 (SD 0.97) to 4.05 (SD 0.94) did not achieve the 75% consensus. The PLO statements (PLO4 and PLO36) pertaining to demonstrating problem solving and scientific skills obtained one of the lowest level of consensus. Table 3 describes the detailed PLO consensus results.

A total of 44 comments (62%) emphasized on combining similar and repeated PLO statements under the same Learning Outcomes domains and 21 comments (30%) highlighted to add and delete certain words in the PLO statements in order to make it more concise and accurate. Another six comments (8%) indicated that some of the PLOs were not achievable and the action verbs used were not measurable (eg, uphold). Based on the level of consensus and comments, the PEO and PLO statements were reformulated to ensure statements were more concise, measurable and achievable.

3.2. Round 2 Delphi

A revised list of ten PEO statements and 15 PLO statements were developed and presented as Delphi Round 2 questionnaire to the same

Table 1
Demographics of the Delphi panel (n = 20).

	Delphi Round 1 & 2 n (%)
Response rate	
Round 1	22 (67%)
Round 2	20 (100%)
Gender	
Male	3 (15%)
Female	17 (85%)
Age	
20–30 years old	1 (5%)
31–40 years old	3 (15%)
41–50 years old	6 (30%)
51–59 years old	9 (45%)
> 60 years old	1 (5%)
Nurse Academician	8 (40%)
Nurse Lecturer	4
Nurse Tutor	1
Head of Diploma Nursing Program	3
Nurse Administrator	5 (25%)
Director of Nursing (Private)	2
Nurse Manager (Public)	1
Deputy Nursing Director for Clinical Practice (Nursing Board Malaysia)	1
Tutor for Nursing Curriculum Development (Nursing Board Malaysia)	1
Nurse Clinical Practitioner	2 (10%)
Nurse Manager	2
Medical Practitioner	3 (15%)
Registered Nurse (newly graduated)	2 (10%)
Highest Qualification obtained	
Diploma	2 (10%)
Bachelor Degree	5 (25%)
Masters	10 (50%)
PhD	3 (15%)
Years of experience as a Registered Nurse	
< 2 years	2 (10%)
3–5 years	1 (5%)
16–20 years	4 (20%)
21–25 years	1 (5%)
> 25 years	9 (45%)
Years of experience as a Medical Practitioner	
16–20 years	2 (10%)
> 25 years	1 (5%)
Area of speciality	
Nursing Education	8 (40%)
Nursing Administration	6 (30%)
Nursing Clinical Practice	1 (5%)
Medical Clinical Practice	3 (15%)
Years of experience in Academia	
11–15 years	1 (5%)
16–20 years	3 (15%)
21–25 years	6 (30%)
> 25 years	1 (5%)

20 panel of experts from Round 1. The results of total consensus from Delphi Round 1 were attached and the expert panel was informed of the reasons for changes and the reformulation of the PEO and PLO statements was based on the majority of experts' comments.

Table 4 describes the consensus for the PEO statements. The level percent of agreement ranges from 80% to 100% with the mean score range of 4.00 (SD 0.79) to 4.55 (0.51), which showed improvement as compared to the Delphi Round 1 results. PEO 8 which requires student nurses to "*demonstrate a sense of altruism and loyalty to the nursing profession*" obtained the lowest percent agreement (65%), similar result after deleting the word "deep" as suggested by the panel in Round 1. One of the comments was "*the word altruism is too strong and meaningless as an objective*". Out of the 24 comments by the panellists, 11 comments (46%) mainly emphasized on the usage of more accurate words when formulating the PEO statements to make it more concise and measurable. The other 13 comments (54%) focussed on combining similar concepts under 1 PEO statement.

Table 2
Consensus for the program educational objectives (PEOs) and program learning outcomes (PLOs) after delphi round 1.

	Statements of PEO which achieved consensus	MQF Learning Outcomes	Mean (SD)	Median	Consensus % agreement
PEO 5	are committed to lifelong learning and understands the need to continuously seek improvement for the nursing profession to keep abreast with global changing trends.	LO7	4.40 (0.68)	4.5	90%
PEO 1	are equipped with fundamentally strong understanding of nursing knowledge and are technically competent in nursing skills as a pre-requisite for the role as an effective Registered Nurse.	LO1, LO2	4.35 (1.08)	5	90%
PEO 2	are responsible, compassionate, committed, conscientious and confident when delivering nursing services to clients and the community.	LO3	4.35 (1.14)	5	85%
PEO 9	are capable of identifying, utilizing and managing information technology to improve nursing practices and further enhance the profession	LO7	4.05 (0.88)	4	85%
	Statements of PEO which did not achieve consensus				
PEO 4	possess excellent and outstanding communication, leadership and managerial skills which would enable him/her to adapt and succeed in the local/international work environment.	LO5	3.80 (1.00)	4	70%
PEO 10	who take up leadership roles and responsibilities in providing voluntary nursing services to the communities and in accordance to the nations needs and developments	LO5, LO8	3.75 (1.29)	4	70%
PEO 7	are capable of conducting basic scientific research and engage in evidence based nursing practices	LO6	3.85 (0.98)	4	65%
PEO 3	uphold professional attitudes and ethics in fulfilling his/her responsibilities towards God, clients and society.	LO4	3.80 (1.05)	4	65%
PEO 6	are capable of adapting to the local and global healthcare work environment	LO3	3.65 (1.04)	4	60%
PEO 8	demonstrate a deep sense of altruism and loyalty to the nursing profession	LO4	3.45 (1.39)	4	55%

MQF Learning Domains: LO1 (Knowledge), LO2 (Practical Skills), LO3 (Social skills and responsibilities), LO4 (Values, Attitudes and professionalism), LO5 (Communication, leadership and team skills), LO6 (Problem solving and scientific skills), LO7 (Information Management and Lifelong learning skills), LO8 (Managerial and entrepreneurial skills).

The percentage of agreement on the PLO statements increased in Round 2 Delphi as described in Table 5. All the 15 PLO statements obtained 75%–90% agreement with the mean score ranging from 4.00 (SD 1.07) to 4.40 (SD 0.68). PLO9 which requires nurse graduates to "*demonstrate critical thinking, creative thinking and problem-solving skills … …*'obtained the lowest percentage of 75% agreement. Similarly as Round 1 Delphi, 15 (31%) out of 49 comments suggested to reformulate the PLO statements particularly in the choice of verbs. Another 34 (69%) comments emphasized on integrating similar concepts into 1 PEO, condensing into 4 or 5 statements in order for it to be manageable.

3.3. Achieving overall level of consensus

The educational objectives (PEOs) and outcomes (PLOs) were determined with a high level of total consensus achieved after Round 2, hence a decision to stop further Rounds of iteration was made. There were no strict guidelines on the correct number of rounds. It depends upon the time available and the complexities of the questionnaires and to avoid response exhaustion after 2 Rounds, especially with busy 'experts' and hard-pressed clinicians (Keeney et al., 2006; Mckenna, 1994). Although consensus was achieved after Round 2, the general comments and suggestions made by the experts were taken into consideration to retain, integrate and modify or delete the PEOs and PLOs to a more manageable list. Based on Table 4, the nine PEO statements which had achieved consensus was reformulated by combining and integrating similar concepts and learning domains to a final list of four PEO statements. Similarly, the 15 PLO statements (Table 5) which had achieved consensus was combined and reformulated into a final list of seven PLO statements. Hence, the final list of four PEO and seven PLO statements determined in this study is presented in Table 6.

4. Discussion

4.1. Panel of experts

The diversity of the panel of experts with the high level of academic qualification (65% post graduate qualification) and their years of experience in academia (35% with > 20 years) added to the trustworthiness of the experts in answering the aim of the study. The representation from nurse administrators and in clinical practice is important as they are recipients of the nurses upon graduation. Their views on the graduates' outcome is crucial for the Faculty to align nursing education to meet the work requirement of nurses hence in bridging the preparation-practice gap (Greenwood, 2000; Brown and Crookes, 2016; Numminen et al., 2014). Greenwood (2000) highlighted that nurses in service expected new graduate nurses to be competent practitioners whereas nurses in education claimed to prepare beginners who are critically reflective and committed to lifelong learning. Based on the demographic details, the balanced representation of nurse academicians (40%) and nurse administrators and in practice (35%) will provide a more objective consensus in answering the study aim. Furthermore, the 100% response rate in Round 2 also demonstrated that the expert panel has an ownership and interest in the study which added to the reliability of the Delphi method.

However, although it was seen that 65% of the participants obtained post graduate qualifications and 40% specialized in nursing education, it can be argued that not all may be well versed in the technical formulation of PEOs and PLOs. This to some degree, may have influence on how they agree with the statements, suggesting the important need for training of Faculty members prior to implementing OBE.

4.2. Consensus on Program Educational Objectives (PEOs)

In Round 1 Delphi, the PEOs which emphasized on knowledge, practical skills and information management and lifelong learning skills obtained the highest level of agreement of 90%. This result further

Table 3
Consensus for program learning outcomes (PLOs) after delphi round 1.

	Statements of PLO which achieved consensus	MQF Learning Domains	Mean (SD)	Median	Consensus % agreement
PLO 34	understand and commit professionally, ethically and responsibly, in line with the nurses' Code of Professional Conduct.	LO4	4.40 (0.75)	4.5	95%
PLO 7	provide basic, safe and effective care to clients using the nursing process approach of assessment, planning, implementation and evaluation	LO2	4.40 (0.68)	4.5	90%
PLO 11	utilise evolving information technology to monitor and improve the health care of clients.	LO7	4.15 (0.81)	4	85%
PLO 12	demonstrate critical thinking and problem solving skills in the delivery of holistic care to well and ill clients	LO6	4.20 (0.95)	4	85%
PLO13	communicate effectively with clients, families, and other health professionals within the context of the healthcare environment	LO5	4.40 (0.88)	5	85%
PLO 2	provide safe, competent and evidence based nursing care to individuals, families, groups, communities and populations	LO2	4.35 (0.74)	4.5	85%
PLO 9	identify, evaluate, and utilise information in health care to support evidence-based practice and engage in lifelong learning for nursing practice.	LO7	4.35 (0.87)	5	85%
PLO 17	utilise information and technology to communicate, manage data, mitigate error, and support decision-making.	LO7	4.15 (0.81)	4	85%
PLO28	demonstrate professional behaviors that are consistent with the ethical and legal framework of nursing.	LO4	4.40 (0.88)	5	85%
PLO 29	demonstrate responsibility as a Registered Nurse by participating as a member of a team to promote holistic, ethical, and compassionate care.	LO3	4.20 (1.10)	4.5	85%
PLO 32	demonstrate professional behavior which maintains and respects client or patient's rights and promotes independence, regardless of race, religion, life-style, sexual preference, disease process, or financial status.	LO4	4.25 (0.85)	4	85%
PLO20	identify, evaluate and use information and employ information technology to engage in lifelong learning.	LO7	4.10 (0.85)	4	80%
PLO21	demonstrate professional behaviors that are consistent with the nursing profession	LO4	4.20 (0.89)	4	80%
PLO22	provide compassionate, ethical care to individuals of diverse cultures, values, beliefs, and lifestyles.	LO4	4.15 (0.87)	4	80%
PLO 10	demonstrate effective, competent and safe nursing practices to clients at all times.	LO2	4.35 (0.93)	5	80%
PLO 14	demonstrate the ability in critical, creative, and reflective thinking within the nursing process that serves to provide the foundation for safe, effective care delivery	LO6	4.10 (0.96)	4	80%
PLO 1	apply knowledge of nursing sciences to assess the clients physiological, psychological, sociocultural and developmental functioning.	LO1	4.20 (0.95)	4.5	75%
PLO 3	provide promotion, maintenance, prevention of illness and restoration of health throughout the life span, and across the continuum of health care environments	LO2	4.10 (0.91)	4	75%
PLO 5	evaluate, analyse, and synthesize information and ideas in order to construct informed, meaningful, and justifiable conclusions.	LO6	3.85 (0.87)	4	75%
PLO15	apply appropriate skills in written, verbal, and nonverbal communication in a variety of clinical contexts	LO5	4.10 (0.78)	4	75%
PLO 16	apply the nursing process across diverse populations and health care settings to provide patient centred care.	LO1	4.05 (0.88)	4	75%
PLO24	protect the rights of people to receive optimum care and make informed decisions affecting their health welfare.	LO3	3.90 (0.91)	4	75%
PLO25	uphold the standards and values of the profession including accepting responsibility for learning and personal growth	LO4	4.20 (0.83)	4	75%
PLO26	collaborate with clients, families, communities and interprofessional health care teams to provide quality health care.	LO3	4.15 (0.81)	4	75%
PLO 33	recognize and examine their own attitudes and assumptions in order to understand and work with others who differ from themselves.	LO3	3.80 (0.83)	4	75%
PLO 35	recognize the importance of and to engage in lifelong learning and professional development activities	LO4, LO7	4.05 (0.99)	4	75%
Statements which did not achieve consensus					
PLO 18	communicate effectively through the exchange of messages in a variety of contexts using multiple modes of communication.	LO5	4.00 (0.91)	4	70%
PLO 19	demonstrate basic nursing skills which facilitate an optimal level of functioning for client or resident, recognizing individual, cultural, and religious diversity	LO2	4.05 (0.94)	4	70%
PLO 31	exhibit a nurse's role that reflect integrity, responsibility, ethical practices and an evolving professional identity as a nurse committed to evidence-based practice, caring, advocacy and quality care.	LO4	4.05 (0.94)	4	70%
PLO23	understand and demonstrate values central to nursing practice including; altruism, autonomy, human dignity, integrity, advocacy, and social justice	LO4	3.95 (0.88)	4	70%
PLO27	demonstrate leadership and management skills in designing, managing and coordinating safe, quality and cost-effective patient-centred care.	LO5, LO8	3.90 (1.07)	4	70%
PLO 8	integrate knowledge of social, health, and nursing sciences, pharmacology, and pathophysiology of diseases in clinical decision making.	LO1	3.85 (0.98)	4	65%
PLO 6	demonstrate knowledge of diverse ideas, cultures, and experiences, and develop the ability to examine their own attitudes and assumptions in order to understand and work with others who differ from themselves.	LO1	3.70 (0.97)	4	65%
PLO 30	demonstrate multicultural competence by valuing open-mindedness, inclusion, multicultural perspectives, and multiple ways of knowing, thinking, and being for clients, families, and colleagues in health care.	LO3	3.70 (1.03)	4	60%
PLO 36	demonstrate fundamental skills in carrying out nursing research and applying research evidence in nursing practice.	LO6	3.95 (0.99)	4	60%
PLO 4	formulate decisions using evolving scientific knowledge in nursing, biological, behavioural and the humanities.	LO6	3.70 (0.97)	4	55%

MQF Learning Domains: LO1 (Knowledge), LO2 (Practical Skills), LO3 (Social skills and responsibilities), LO4 (Values, Attitudes and professionalism), LO5 (Communication, leadership and team skills), LO6 (Problem solving and scientific skills), LO7 (Information Management and Lifelong learning skills), LO8 (Managerial and entrepreneurial skills).

Table 4
Consensus for the program educational objectives (PEOs) after delphi round 2.

	Statements which achieved consensus	MQF 8 Learning Outcomes	Mean (SD)	Median	Consensus % agreement
PEO 1	are equipped with a strong understanding of nursing knowledge and are competent in nursing skills to be an effective Registered Nurse.	LO1, LO2	4.55 (0.51)	5	100%
PEO 6	possess effective communication skills which will enable him/her to work efficiently in a multidisciplinary team in rendering quality care to clients.	LO3, LO4	4.45 (0.60)	4.5	95%
PEO 9	are equipped with the knowledge and skills to identify, utilise and manage information technology to improve nursing services and further enhance the profession.	LO7	4.10 (0.71)	4	90%
PEO 5	are committed to lifelong learning and understands the need to continuously seek improvement for the nursing profession to keep abreast with global changing trends.	LO7	4.35 (0.74)	4.5	85%
PEO 2	are responsible, compassionate, committed, conscientious and confident when delivering nursing services.	LO2,LO3,LO4	4.30 (1.03)	5	85%
PEO 7	are equipped with the ability to conduct basic scientific research and are engaged in evidence- based nursing practices.	LO6	4.05 (0.75)	4	85%
PEO 3	uphold professional attitudes and ethics in fulfilling his/her nursing responsibilities towards clients and society.	LO3, LO4	4.40 (0.82)	5	80%
PEO 4	possess good leadership and managerial skills which would enable him/her to adapt and succeed in both local and international work environment.	LO5, LO8	4.20 (0.76)	4	80%
PEO 10	are inspired to assume leadership roles and responsibilities to participate in community work in accordance to the nations needs and developments.	LO3, LO5	4.00 (0.79)	4	80%
	Statement which did not achieve consensus				
PEO 8	demonstrate a sense of altruism and loyalty to the nursing profession.	LO4	3.75 (1.16)	4	65%

MQF Learning Domains: LO1 (Knowledge), LO2 (Practical Skills), LO3 (Social skills and responsibilities), LO4 (Values, Attitudes and professionalism), LO5 (Communication, leadership and team skills), LO6 (Problem solving and scientific skills), LO7 (Information Management and Lifelong learning skills), LO8 (Managerial and entrepreneurial skills).

Table 5
Consensus for program learning outcomes (PLOs) after delphi round 2.

	Statements which achieved consensus	MQF Learning Domains	Mean (SD)	Median	Consensus % agreement
PLO 1	apply knowledge of nursing sciences to assess the clients physical, physiological, psychological, sociocultural and developmental functioning.	LO1	4.40 (0.68)	4.5	90%
PLO 12	demonstrate compassion and a caring attitude towards clients of diverse cultures, ethnicity, religion, values, beliefs and lifestyles.	LO4	4.45 (0.68)	5	90%
PLO 4	work efficiently with other healthcare professional who are different in ideas, cultures and experiences in order to provide quality care to clients.	LO3	4.30 (0.65)	4	90%
PLO 14	demonstrate leadership and management skills in designing, managing and coordinating safe, quality and cost-effective patient-centred care.	LO5, LO8	4.10 (0.71)	4	90%
PLO 5	integrate knowledge of social, health, and behavioural sciences into nursing practices.	LO1,LO2	4.35 (0.87)	5	85%
PLO 10	demonstrate professional behaviors that are consistent with the standards and ethics of the nursing profession, in line with the nurses' Code of Professional Conduct.	LO4	4.40 (0.75)	5	85%
PLO15	recognize the importance and participate in lifelong learning and professional development activities.	LO4, LO7	4.25 (1.11)	5	85%
PLO 6	provide basic, safe, competent and patient centred care to clients using the nursing process approach of assessment, planning, implementation and evaluation.	LO2	4.20 (0.83)	4	85%
PLO 11	demonstrate values central to nursing practices including: altruism, autonomy, human dignity, integrity, advocacy, and social justice.	LO4	4.15 (0.67)	4	85%
PLO 2	provide promotion, maintenance, prevention of illness and restoration of health throughout the life span, and across the continuum of health care environments.	LO2	4.10 (1.07)	4	85%
PLO 7	Utilise information technology to support nursing practices and to engage in lifelong learning.	LO7	4.10 (0.64)	4	85%
PLO13	demonstrate responsibility as a Registered Nurse by collaborating with clients, families and communities to promote health.	LO3	4.05 (1.05)	4	85%
PLO 8	communicate effectively with clients, families, and other health professionals in a variety of clinical contexts.	LO5	4.45 (0.82)	5	80%
PLO 3	evaluate and analyse information and ideas in order to make effective decisions and apply scientific evidence in nursing practices.	LO6	4.00 (1.07)	4	80%
PLO 9	demonstrate critical thinking, creative thinking and problem- solving skills in the delivery of holistic and quality care to all clients.	LO6	4.15 (0.93)	4	75%

MQF Learning Domains: LO1 (Knowledge), LO2 (Practical Skills), LO3 (Social skills and responsibilities), LO4 (Values, Attitudes and professionalism), LO5 (Communication, leadership and team skills), LO6 (Problem solving and scientific skills), LO7 (Information Management and Lifelong learning skills), LO8 (Managerial and entrepreneurial skills).

Table 6
PEO and PLO for the diploma in nursing program.

	Program Educational Objectives
	The Diploma in Nursing Program aims to produce nurse graduates who:
PEO 1	are equipped with an understanding of nursing knowledge and are competent in carrying out nursing skills with care and compassion.
PEO 2	uphold professional attitudes and ethics in fulfilling his/her nursing responsibilities towards clients and society.
PEO 3	demonstrate effective communication skills and possess leadership and managerial qualities when working in a multidisciplinary team in the delivery of nursing services.
PEO 4	are committed to integrate information technology in lifelong learning and engage in evidence-based nursing practices in line with healthcare trends.

	Program Learning Outcomes
	After the 3 years Diploma in Nursing Program nurse graduates will be able to:
PLO 1	apply knowledge of nursing and sciences to nursing practices.
PLO 2	demonstrate basic, safe and competent patient centred care using the nursing process approach.
PLO 3	demonstrate critical thinking and problem solving skills to make effective clinical decision.
PLO4	communicate effectively with clients, families, other health professionals and the community in a variety of context.
PLO 5	demonstrate professional behaviors that are consistent with the values, standards and ethics of the nurses' Code of Professional Conduct.
PLO 6	engage in lifelong learning by utilizing information technology skills.
PLO7	demonstrate leadership and managerial qualities when working in a team in providing cost- effective patient-centred care.

supports the description of what is expected of Diploma learners as mentioned in MQF (2011). Learners are to have a broad knowledge of the general theories, principles and demonstrate skills in a focused area of study/discipline and an interest in pursuing further education. It also suggests that majority of the experts still emphasized on knowledge acquisition over higher level abilities of applying and evaluating knowledge in the real-world context. Gruppen et al. (2016) supports that although knowledge is critical, demonstration of skills, relevant attitudes, judgement and persuasive leadership are all features and attributes that are necessary for effective professional practice for health professions education.

The PEOs which obtained less than 75% agreement were related to the learning domains of Values, moral, ethics and professionalism; communication skills; thinking and scientific skills; and leadership skills. These learning outcomes are the essence of the nursing profession and the priority outcomes and core competencies of most nursing programs (Oh et al., 2011; Singapore Nursing Board, 2018). The possible explanation to these findings could be that the verbs used in formulating the PEO statements, eg "*capable*", "*uphold*", "*possess*" were unmeasurable and unrealistic, thus would have influenced the low level of consensus. However, it can be argued that PEOs are not directly measurable but serve as an aim of what graduates will be many years after graduation.

Also, PEO 8 which states that a Diploma graduate should "*demonstrate a sense of altruism and loyalty to the nursing profession*" did not achieve consensus after both Delphi Rounds considering that nursing is regarded as a caring, noble profession of selfless service to others. Altruism encompasses compassion/empathy and an unselfish concern for others (Schmidt and Mcarthur, 2018). Sadly, as nursing became more evidence-based and technologically challenged, the value of altruism has been eroded over past decades (Johnson et al., 2007; Cho et al., 2010). The motivation to nurse is now primarily driven by monetory and personal gains (Cho et al., 2010). Nevertheless, several studies (Thorpe and Loo, 2003; Straughair, 2012; Carter, 2014; Schmidt and Mcarthur, 2018) still uphold and considered the importance of altruism as an essential value in nursing practice, one which should not be considered as outdated and irrelevant but a value that must be restored, more so at this time of increasing ethical dilemmas. To further support this statement, Griffiths et al. (2012) found that what service users and carers seek in graduate nurses is a caring professional attitude. Nevertheless, PEO 8 was discarded as it did not achieve consensus, but the concept of compassion and empathy were maintained and included in the final list. This suggests that altruism in nursing should be further explored in future studies to confirm its inclusion or exclusion as a learning outcome for nursing education.

PEO 3 which requires nurse graduates to "*uphold professional*

attitudes and ethics in fulfilling his/her responsibilities towards God, clients and society" obtained 65% consensus in Round 1 and 80% consensus in Round 2 upon removal of the word "God". As mentioned by Scammell (2017), although nurses pride themselves on taking a holistic approach to service users, the dimensions on spirituality and religious belief remains unclear in pre-registration nursing education. Some nurses may not be comfortable with the idea of spirituality and religion; some may have specific or no religious belief and may feel ill-prepared to support others with a different view. Nevertheless, if nursing believes in holistic care, this element of spirituality should be further investigated to see whether it should be included as one of the objectives in pre-registration nursing education.

Generally, the findings from Round 2 Delphi showed a higher level of consensus on all the PEO statements with 90% of PEOs achieved more than 75% level of agreement.

4.3. Consensus on Program Learning Outcomes (PLOs)

The PLOs with the highest level of consensus ($\geq 90\%$) after Round 1 were under the Learning domains of values, ethics, and professionalism; and practical skills. This corresponds with the expected level of a Diploma graduate which emphasizes on theory-practice balance and instillation of values, ethics and attitudes (Malaysian Qualifications Framework, 2011). It was observed that PLO statements which did not achieve consensus were PLOs that used too many specific variables which were difficult to measure and not achievable. According to Gronlund & Brookhart (2008), objectives and outcomes statement should be free from specific content so that it is applicable to all units of studies in a course. The lowest level of consensus (55%–60%) obtained were PLOs related to Problem Solving and Scientific Thinking skills, ie carrying out and applying nursing research. Despite reformulating the PLO statements for Delphi Round 2, it still obtained the lowest level of agreement (75%). This may suggest that the panellists viewed obtaining basic nursing knowledge and practical skills as most important at the Diploma level. The development of higher order thinking skills can be further emphasized at the Degree level. However, since the nursing Degree program in Malaysia has yet to become the minimum standard for initial licensure and with the poor research culture among nurses in Malaysia (Birks et al., 2009), critical thinking skills and scientific skills must be included and emphasized as a learning outcome for the Diploma nurse graduate. This also helps to increase students' abilities to deal with the fast-changing clinical environment effectively in future (Lee et al., 2011).

In Round 2 Delphi, PLO statements were clearer and more manageable which resulted in higher achievement of consensus. The PLO pertaining to Communication skills obtained a lower level of consensus

(80%) comparatively, despite being an important learning outcome for nurses. As communication skills can be integrated into social skills and teamwork, the researchers consolidated both the outcome domains in the final list.

4.4. Strengths and limitations

The Delphi method is a reliable way to determine the essential educational objectives and outcomes. The expert panel was chosen in an objective manner based on their expertise, and they represented a balance perspective from nursing education and nursing practice. Although the study was conducted in the Malaysian context, the findings can be generalized to other context as the concept of nursing is similar globally.

Although the sample size was relatively small (N = 20), the response rate of 100% for the second round of Delphi increased the reliability of the study. Hsu & Sandford (2007) indicated that a sample size of 10–15 may yield sufficient results. The current study has some limitations related to well-known Delphi-criticisms which includes the question of 'imposed consent' and that a Delphi-study possibly does not provide a space for discussion and debate (Foth et al., 2016). The greatest setback is also the paucity of scientific literature on the essential educational outcomes for pre-registration (Diploma) nursing program, making it difficult to compare the results of this study with other similar studies. Nevertheless, this study has important implications in regard to nursing education and clinical practice, and may provide insight into new directions for future research.

4.5. Research implications

4.5.1. Nursing education

The findings from this study sets the foundation towards an OBE curriculum change and can be readily employed or modified by any institution which adopts an outcome-based nursing curriculum particularly for the pre-registration nursing program. This study outcomes will be first recommended to the Malaysian Nursing Board to serve as a standard reference for all nursing institutions as they implement the OBE curriculum. It could also serve as a comparison and a basis for the Bachelor of Nursing program to build upon when they review their curriculum particularly in determining their PEOs and PLOs.

In light of the initiatives to harmonize and align nursing education among the Southeast Asian nations HOCCS, 2016, this Delphi study serves as a reference to harmonize educational outcomes particularly for the ASEAN member countries which still maintains the Diploma nursing program. Subsequently, this may create opportunities for a more coherent credit transfer system to ease nurses career mobility and migration within the region.

4.5.2. Nursing practice

With these outcomes defined, nurse administrators and clinical nurses should have a more realistic expectation of what a newly registered nurse is able to perform, hence reducing the stress of these new nurses and the attrition rate of them leaving the profession prematurely. Competency checklist and standards for clinical practice can be developed or improved based on these set of outcomes.

4.5.3. Nursing research

A focus group discussion to validate the result of this study is to be considered in future. This enables comparison of results to generate richer evidences of educational outcomes for newly qualified nurses. It is important to investigate whether the achievement of these educational outcomes correlates with better preparation for work as a Registered Nurse and in the improvement of their clinical competencies, thus narrowing the preparation-practice gap.

5. Conclusion

Consensus was achieved for all objective and outcome statements except for one objective statement after two Delphi Rounds. The final list of four PEO and seven PLO statements were determined keeping in line with MQF learning outcome domains. The findings of this study can be used as a foundational step when developing an OBE curriculum for prelicensure nursing education. Nursing institutions can expand and modify on these educational outcomes according to their institutional goals. Future research is recommended to validate the study findings and to look into the impact of the achievement of these outcomes on the professional competencies of newly Registered Nurses.

Conflicts of interest

Funding source

Ethical approval

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.nepr.2019.08.002.

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