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# Validating the Medical Education e-Professionalism Framework Using the Content Validity Index

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## ABSTRACT

The digital realm has changed the evolving landscape of medical professionalism. In this context, Guraya et al., developed the Medical Education e-Professionalism (MEeP) framework to navigate the desired competencies of healthcare professionals in the digital world. This mission-based framework has three constructs of professional values, behaviours and identity, each with several relevant competencies. To determine the content validity of the MEeP framework, we adopted a systematic approach using the content validity index (CVI) by engaging six subject experts in the field. During an online meeting, a brief overview of MEeP was provided, and experts interacting in a real-time manner provided numerical ratings and free-text comments for each competency of all three constructs. The CVI scores ranged between 0.83 and 1.0, indicating acceptable content validity of all twelve items of the three MEeP constructs. Nine out of twelve items [conformity, benevolence, universalism and integrity (values); communication and self-awareness (behaviour); reflective, conscientious and self-actualisation (identity)] were unanimously deemed relevant by all experts. However, five out of six experts agreed on tolerance, power and self-direction items. After incorporating the experts' opinions, the validated MEeP framework retained these three constructs. However, the comments of one expert regarding the self-awareness competency in the behaviour construct were given extra attention. We transferred the self-awareness competency from behaviour to the identity construct definition, making it a highly desirable attribute alongside self-regulation. The validated MEeP framework can now be effectively used by healthcare professionals to acquire the desired professional competencies in the digital realm.

**Keywords:** *Content validity index, Framework validation, e-Professionalism, Professional values, Professional behaviours, Professional identity*

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## INTRODUCTION

The rapid expansion of the digital realm in both personal and professional lives has created many new challenges to medical professionalism. Despite a staggering rise in the events of lapses in the medical field of e-professionalism, little is known about the corrective measures to rescue the core principles of professionalism in the digital world (1–2). To overcome this shortcoming, Guraya et al. (3) recently developed a mission-based medical education e-professionalism (MEeP) framework using ontological, epistemological and axiological legacies. MEeP illustrates the fundamental competencies of e-professionalism for healthcare professionals using three major constructs: professional values (conformity, benevolence, universalism and integrity), professional behaviours (communication, self-awareness, tolerance and power) and professional identity formation (reflective, conscientious, self-directed and self-actualisation). The core tenet of the MEeP framework sheds light on the understanding of professional and personal cyberspace for healthcare professionals using social media while maintaining conscientiousness, privacy, conformity and accountability.

The introduction of a framework or scale in a specific field involves its development, validation and evaluation. Although all these phases are crucial, the validation of a scale or framework plays a vital role in determining its scientific rigour and educational value (4). Content validity entails the extent to which a scale has sufficient samples of items to manifest the construct of interest (5). The methodological strategies for framework validation range from literature review of the existing body of knowledge, consultation with experts or peer review to exploratory communications with target groups (6). These mechanisms provide a rich body of information that assists researchers in generating and judging specific items and constructs of the instrument. The rigorous process of content validation of apparently similar constructs of the framework strengthens the justification for the inclusion of specific items in the final dossier.

Polit et al. (7) produced a content validity index (CVI) for the validation of scales and frameworks by computing data of experts' ratings on item relevance. This index numerically computes the experts' ratings on each item and construct of the instrument with a clear advantage of understandability, depiction of content relevance and a focus on consensus rather than consistency. Although experiential content validity (8) and concept mapping for scale development and validation (6) have some advantages, the Polit model of content validity has been reported to be more objective and convenient.

This study was conducted to determine the content validity of the MEeP framework using a systematic approach by consulting a panel of subject experts in medical professionalism.

## MATERIALS AND METHODS

In our study, we aimed to validate the MEeP framework using an expert review as a validation tool. An expert review is a process of inviting a group of subject experts to provide their opinions and remarks on a given concept (9). Internal validity of a research-based tool pertains to “the extent to which research findings are a true reflection or representation of reality rather

than being the effects of extraneous variables" (10). On the other hand, external validity refers to the degree to which such observations or appraisals of reality can be legitimately applied across groups. We determined the content validity of the MEeP framework in a quantitative manner using CVI (7). However, we adopted the modified six-step approach of experts' judgements introduced by Yusoff et al. (11), in preference to the alternative of the stepwise approach, for the process of content validity.

### **Step 1: Preparing the Content Validation Form**

We prepared a bespoke content validation form (Appendix 1) which ensured that the required task was explicitly stated, and expectations were conveyed to the review panel. A short summary of the MEeP framework with clear definitions of its constructs was detailed. The relevance was determined using a four-point rating scale (1 = not relevant; 4 = highly relevant) to score individual items.

### **Step 2: Selecting a Panel of Experts**

Assessment of the content validity can be conveniently performed by a panel of content experts who individually and critically evaluate the relevance of each proposed item (12) (13). We recruited a purposive sample of international experts in medical professionalism to participate in our study via email invites. The experts were chosen based on their experience and expertise in the field of medical professionalism in the digital realm who could endorse the process of content validity. There is no consensus about the required number of content experts for content validity, however, two to twenty experts have been proposed in the literature (14). Keeping in view the availability and relevance of the experts for the chosen topic, we selected a panel of six experts. All six experts were seasoned researchers in the field of medical professionalism with several research publications on the subject. Following their confirmation and agreement to participate in this research, all further correspondence with experts was carried out via email. Upon consenting, they received the validation form and an elucidation of its contents.

### **Step 3: Conducting Content Validation**

In May 2021, we arranged an online meeting via MS Teams with the selected experts to participate in the validation process of the MEeP framework. The session of validation began with a brief introduction to e-professionalism and the recognition of the paucity of frameworks to guide users as they navigate the digital realm. The newly developed MEeP framework was introduced by illustrating the journey from its conception to development. Then, the MEeP framework and its professionalism constructs of values, behaviours and identity were explained. Additionally, the integral connection of the framework constructs with the professional mission was highlighted. Any queries from the experts were explained during the meeting.

#### Step 4: Reviewing the Domains and Items

During the meeting, the experts were requested to critically review each construct domain and its items before providing a score for each item in a real-time manner. The experts were encouraged to provide written comments to improve the relevance of items to the targeted constructs.

#### Step 5: Providing a Score on Each Item

The experts were asked to use the Inter-item Content Validity Index (I-CVI) form (15), which was sent to all experts via email on Google docs. The experts assessed each item's relevance on a four-point scale (1 = not relevant; 4 = highly relevant). The four-point scale was chosen because it omits the option of a neutral answer that could have a strong buffering effect on the study findings among a small pool of experts. All experts rated individual items on the scale of relevance and provided free-text comments. The analysis of the CVI value for each item (based on individual items) was performed.

#### Step 6: Calculating CVI and Item Refinement

Each response from experts was analysed using two steps: a) each item score was calculated individually and b) the calculation of the overall concept was based on specific item ratings. Two forms of CVI have been described: CVI for item (I-CVI) and CVI for scale (S-CVI) (16). For the calculation of S-CVI, the average of the I-CVI scores for all items (S-CVI/Ave) was determined (Figure 1). Prior to the calculation of CVI, the relevance rating was coded as 1 (relevance scale of 3 or 4) or 0 (relevance scale of 1 or 2). To illustrate the calculation of the different CVI indices in our study, the relevance ratings of the item scale by the six experts are shown in Table 1.

We used the qualitative comments to refine the items of all three constructs of the MEeP framework. Then, all results were discussed among co-investigators and a consensus was developed to make decisions for item deletions, alterations and additions with a minimum CVI of 0.83 for acceptability (7) (16).

Table 1: The relevance ratings on the item scale by ten experts

Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Experts in Agreement	I-CVI
Conformity	4 (1)	4 (1)	4 (1)	4 (1)	4 (1)	4(1)	6	1
Benevolence	4 (1)	4 (1)	4 (1)	4 (1)	4 (1)	3(1)	6	1
Universalism	4 (1)	4 (1)	4 (1)	3(1)	4 (1)	3(1)	6	1

Integrity	4 (1)	4 (1)	4 (1)	4 (1)	4 (1)	3(1)	6	1
Communication	4 (1)	3 (1)	4 (1)	4 (1)	3(1)	4(1)	6	1
Self- awareness	4 (1)	4 (1)	4 (1)	4 (1)	4 (1)	4(1)	6	1
Tolerance	4 (1)	3 (1)	4 (1)	4 (1)	1(0)	3(1)	5	0.83
Power	4 (1)	2 (0)	4 (1)	4 (1)	4 (1)	3(1)	5	0.83
Reflective	4 (1)	3 (1)	4 (1)	4 (1)	4 (1)	4 (1)	6	1
Conscientious	4 (1)	3 (1)	4 (1)	4 (1)	4 (1)	4 (1)	6	1
Self-directed	4 (1)	4 (1)	4 (1)	2(0)	4 (1)	4 (1)	5	0.83
Self-actualization	4 (1)	3 (1)	4 (1)	3(1)	4 (1)	4 (1)	6	1
							S-CVI Av	0.96
Proportion relevance	1	0.92	1	0.92	0.92	1		0.96
Average proportion of items judged as relevance across 6 experts								5

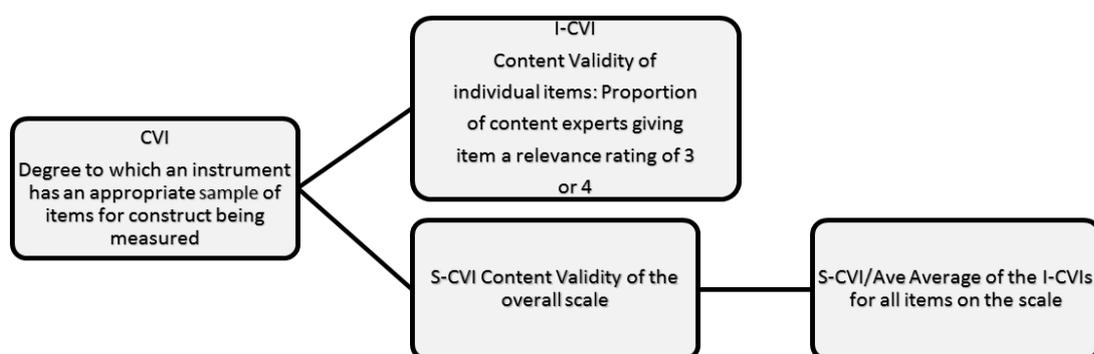


Figure 1: Definitions of content validity terms. I-CVI, item-level content validity index; S-CVI, scale-level content validity index, universal agreement calculation method; S-CVI/Ave, scale-level content validity index, averaging calculation method.

## RESULTS

Overall, five out of six experts agreed on the content validity of the framework. For all twelve items of the three constructs of the MEeP framework, CVIs ranged between 0.83 and 1.0, indicating an acceptable content validity. Nine of twelve items, namely conformity, benevolence, universalism and integrity (values), communication and self-awareness (behaviour), reflective, conscientious and self-actualisation (identity), were unanimously deemed relevant. However, five out of six experts agreed for the items of tolerance, power and self-direction. In terms of scale ratings, we found that all experts agreed on the values construct, while five out of six experts agreed on tolerance and power in the behaviour construct and self-direction in the identity construct. For the universal agreement, a score of 1 was allocated to an item that achieved 100% expert agreement. Tolerance, power and self-direction got 0 because not all experts agreed, and an I-CVI score of 0.83 was recorded as shown in Table 1. Looking at the S-CVI/Ave, based on I-CVI and the relevance proportion, a score of 0.96 was recorded in both domains. Based on these calculations, we concluded that I-CVI and S-CVI/Ave achieved a satisfactory level; thus, the validation of the MEeP framework scale secured an optimal level of content validity.

Across the MEeP framework, experts' comments were arranged into four categories.

First, content experts applauded and praised the competencies identified in different constructs.

"Perhaps conformity to the established digital/social media standards within the global, national and professional context." (E1)

Experts considered universalism as respecting humanity or the audience by demonstrating tolerance.

"Universalism should always provide room for contextualization to the local culture, belief and practices. One good framework for incorporating universalism could be the UN charter of human rights that provides a list of universal human rights." (E1)

"Very similar to Tolerance highlighted." (E2)

"I think that this competency somewhat overlaps with conformity and benevolence. But yes - commitment to public good is important." (E4)

Later, experts commented on the behaviour construct where communication was well received. A conformance approach to the digital rules via clear communication was deemed obligatory.

"In addition of the flow of digital conversation, it could be following the principles and rules of digital communication." (E6)

Regarding the reflection item in the identity construct, the following excerpts are notifiable:

"Agree that this is very important. Suggest (maintaining) 'Reflective' (as it appears as 'Reflection' in the slide)." (E4)

Second, one expert recommended broadening the definition of integrity and power as follows:

"The moral uprightness is fine, but I see more value attached to a commonly agreed upon set of ethical and legal values. Remember that morality is internal, and ethics is external. (integrity)." (E1)

'Power' was perceived as a broad concept enveloping quite several attributes needed in the digital world. One of the experts argued that power was a behaviour as described in the Hofstede cultural dimension, while another expert perceived power as self-restraint. Furthermore, another expert elaborated on the concept of power by adding trustworthiness to its definition.

"Power (resonates) Hofstede cultural dimensions." (E1)

"Suggest changing to self-restrain and you can delete as it is already in the first item." (E3M)

"This is important but my suggestion for statement is "status, trustworthy, freedom, and control of people and resources." (E4)

Third, our experts highlighted the redundancy of the tolerance item and suggested modifications in its placement.

"Respecting others' views." (E1)

"Suggest (changing) to respect." (E2)

"It is more suitable under identity concept." (E5)

Fourth, an expert suggested combining certain items to make a particular construct coherent.

"It could be self-awareness and regulation. (self-awareness could be under Who am I?) The four competencies mentioned under Who am I closely relate to Self-awareness. Reflection helps in self-awareness, leading to self-direction, conscientiousness and eventually self-actualization and self-regulation. Daniel Goleman's Emotional Intelligence quadrants, especially the ones related to SELF (are relevant here)." (E1)

"The first quadrant of Daniel Colemans framework of Emotional could be very useful for you to develop the attributes of self-awareness. Iqbal calls it the philosophy of 'Khudi'." (E1)

One expert pointed out the need for the inclusion of the role of supervision, as he perceived that self-direction alone would not suffice in the digital world.

"I think this is important but not standalone. Sometimes we may have to consult or triangulate input from someone else. Hence if this is to be included, it might need some proviso." (E4)

To summarise, the three constructs remained unchanged. However, the self-awareness competency of the behaviour construct was shifted to the identity construct. This change was rightly recommended by one expert, so, we changed self-direction to an attribute of identity rather than competency of the behaviour constructs. Also, another expert advised that self-direction was not sufficient without a proviso in the digital world. If the self is aware of 'itself', then regulation sets in. After incorporating the experts' opinions and suggested changes, the final validated MEeP framework was produced as illustrated in Figure 2.

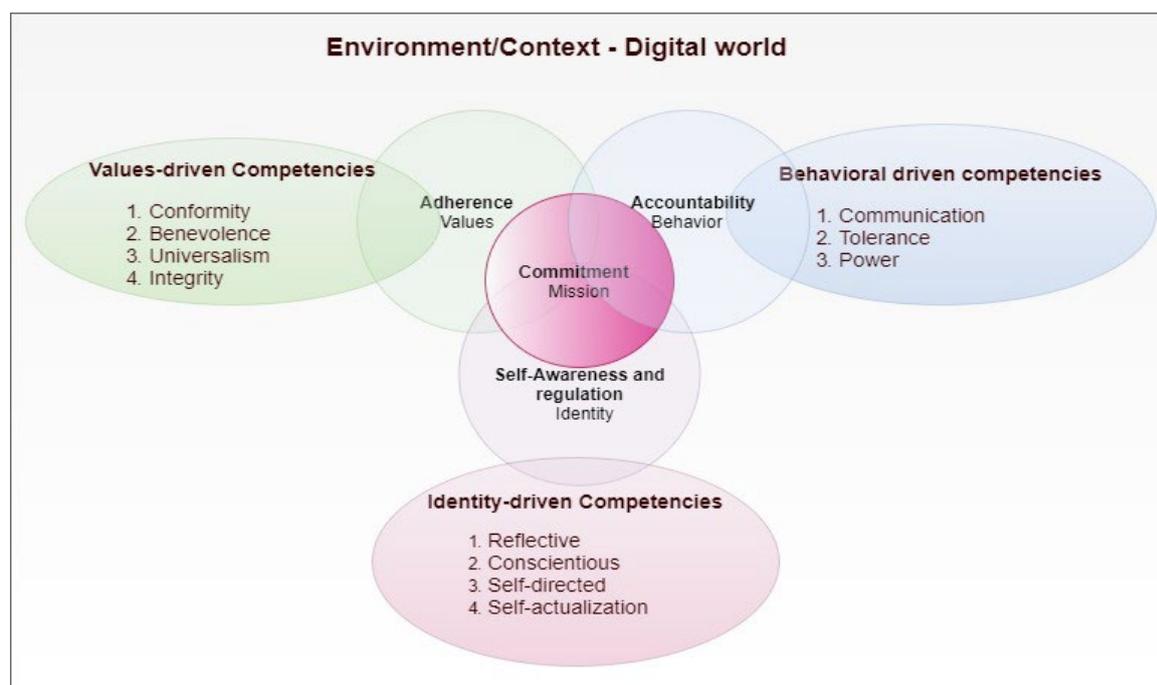


Figure 2: The final validated MEeP framework after panel discussion. Main constructs remained unchanged except, self-awareness competency was relocated from the behaviour construct to the identity construct as the part of identity definition. Modified from Guraya SS, et al. (3).

## DISCUSSION

Our study presents a case of the successful completion of content validity of the MEeP framework by experts using a robust process of framework validation. Complying with the comments and observations of the experts, we transferred the self-awareness item from the behaviour to the identity construct, under the self-regulation attribute. These transformations fell into the emotional intelligence paradigm of Daniel Goleman (17). Reflection was better stated as reflective, and the definitions of the integrity and power items became more inclusive of the experts' comments. Nevertheless, the three constructs of the MEeP framework maintained their cyosure of the mission.

During the content validity process and to achieve conformity, all experts showed a universal agreement with the published literature (18) and highlighted the need to be conformative with the digital world, irrespective of geographical territories and restraints (19). To further endorse these findings, a recent publication (20) explored the mechanisms of social media use a 'purer' form of expression creating a tension that manifests into litigation. This reminds us of the recent rightful societal concerns about social media usage. McLuhan's proclamation 'medium is the message' (21) urged Oprysk and Sein (22) to consider that the digital content directive is a

valuable repository of basic regulations for the supply of digital content to consumers. This directive recommends a range of sanctions for consumers who lack conformity of contents on the used platform and restrictions for those who violate its code and consumer expectations. Such a dossier carries value as it sheds light on the terms and conditions of major service providers and digital content with a focus on the sanctions and limitations placed on its contents. Some of the suggested key restrictions include a regulated approval for obtaining a backup copy of the digital content, limiting the non-simultaneous use of digital content on the consumers' devices and a conditional sharing of digital content outside the consumer's immediate family. The study by Triaille et al. (23) also eluded to similar limitations and restrictions on the public digital lending rights, digital content copyrights and exclusive rights in the digital environment within the European Union.

In our study, the experts rated the universalism item as a core attribute in the digital world, a societal and cultural contextualisation with digital interaction. In addition, universalism was considered a harbinger of kinship with another competency, benevolence, in the values construct. However, the care and respect for the unknown made this attribute distinct from the rest. In the study by Heinderyckx (24), the investigator argued that the content of news worthy of reporting should be carefully enriched with scientific knowledge. These findings are based on the fact that scientific knowledge should reflect cultural, social and geographical differences that could form a basis for the concept of universalism. A consensus and a unified regulatory directive with a worldwide acceptability of universalism are essential prerequisites.

From another perspective, the narrative of national public universalism emphasises that every citizen should receive a similar set of information (25) (26). Some experts have proposed that the publication of information should ensure a diversity of citizens' exposure to the media content (27) (28). The emerging concept of personalised universalism in the age of algorithms has changed the landscape of professionalism in the medical field. Exploring this concept, Bozdog and van den Hoven (29) objected that mere algorithms are anti-democratic as their creation is directly related to the type of democracy, one is contemplating. A more liberal deliberative approach would be to advocate to voice all concerns to the masses. Regardless of the type of democracy, a common consensus of societal unease prevails concerning the transformation of the executive decision-making from human agency to technical algorithms. Finally, there is an ongoing debate that medical personalisation in the digital world is primarily based on privacy issues for the collection and ownership of profile information (30), the questionable transparency of algorithms (31), and the bias of filter bubbles (32). It seems that some of these reservations are overblown, but the issue is incredibly relevant to the key concept of universalism in the medical field.

During the discussion forum, our experts considered tolerance and power as two distinct attributes. Tolerance, a multidimensional construct, was perceived as a way to show respect to the audience or the public. One of the experts recommended moving tolerance to the identity construct as it was considered a part of identity. However, authors believe that tolerance is a behaviour of the action of 'who am I' rather than the identity itself. Hence, it was kept in the same construct. On the other hand, tolerance is viewed as an essential pillar for highly socialised societies with vast and divergent lifestyles and cultural habitats (33). Tolerance has been classically defined as a concept with 'forbearance of others and their ideas to neo-classical versions explaining tolerance as an appreciation and acceptance of others' ideas, behaviour, and beliefs' (34). Another modification of this concept implies that societies should positively accept and adopt substitute ways of feeling, thinking and acting, even though they are not considered their own (35). In congruence with these considerations, the experts viewed it as an essential

pillar of a tolerant digital society with cultural empathy, open-mindedness, sociability and emotional stability.

The power construct of the MEeP framework triggered a rich discussion among the experts. One of the experts stated that power was a behaviour as described in the Hofstede cultural dimension, who postulated six dimensions of national cultures: 'power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, long/short term orientation, and indulgence/restraint' (36). One of the experts discussed the power of self-restraint as a key element for a healthcare professional. At the same time, another expert elaborated on the concept of power by adding trustworthiness to its definition. Interestingly, Boyd and Pennebaker (37) have proposed that the growing availability of data and master-class developments in technological power are rapidly opening new avenues for the study of personality at a 'big data' scale. These possibilities would permit educators to better understand the fundamental characteristics of human personality best suited for the digital world.

We have witnessed a staggering rise in the use of social networking sites over the past decade (38) (39). Although the use of Web 2.0 technology has several advantages for leisure, fun, business facilitation, cognitive skill development, social interaction and capital, there are serious concerns about its disadvantages of addiction, self-isolation and psychosocial dissonance (40). The literature is replete with the evidence of the addictive use of video games and social media characterised by salience (preoccupation with a particular behaviour), mood swings (behaviour to relieve or reduce aversive emotional events), dependency and the consequences of withdrawal (41). The excessive use of social media has also been reported in a self-selective exposure study, where individuals were more inclined to interact with information that reconfirms their pre-existing beliefs (42). We should be mindful of the fact that self-selective exposure potentially influences political and professional tolerance, which could undermine the unbiased and neutral democratic systems in place. All these glaring disadvantages of the excessive use of social media converge towards the same ideology of an optimal and regulated use of these technological tools to preserve personal and professional identities, especially in the medical field.

There are scarce opportunities for securing digital citizenship in formal and informal learning in higher education. There is concrete evidence that a regulated civic engagement in digital citizenship can facilitate education in middle and high school (43). However, high school students develop their digital citizenship during out-of-school practices. A systematic approach to educating school students about attaining digital citizenship through scheduled and extra-curricular activities would potentially lead to a more effective learning experience via a media-facilitated curriculum (44). Moreover, during the discussion, the experts recommended moving self-awareness to the identity construct to align it with the emotional intelligence paradigm of Daniel Goleman (17). These two dimensions of emotional intelligence, self-regulation and self-awareness, have been shown to carry a significant positive influence on the academic performance of university students (45). When viewed through the lens of computer-mediated communication, mostly visual anonymity and text-only interactions dominated (46), both of which essentially lacked the possibility of natural face-to-face interaction, containing an incredibly low socio-emotional interface. These anti-social, anti-normative and uninhibited behaviours would certainly jeopardise the development of self-awareness and self-regulation of social media users (47).

To summarise the debate on the merits and demerits of the use of social media in medical education, Dabbagh and Kitsantas (48) reported on this subject as a trade-off between formal and informal learning. According to their narrative, social media has provided pedagogical

affordances that facilitate and thrive students' self-regulated learning via the creation of personalised digital learning spaces. A range of self-regulated learning activities, such as goal setting, desired learning targets, personalised timetabling and planning, can be created in the self-generating content. One expert was of the view that an untethered self-direction will not work unless it is augmented by a proviso. However, keeping in mind the digital algorithm of powerful, public and permanent, self-direction is a highly desired quality. The attainment of this stage before self-actualisation would need to be phased out by the reflective and conscientious state of self. This comment came from a relatively young expert in the field.

For the competencies of conscientiousness and self-actualisation, a wide array of research has shown that social media usage is negatively related to the professional characteristics (49). The enormous use of social media has been shown to lower self-esteem, conscientiousness and self-actualisation (50). Soomro and Ahmad (51) reported that an hour per day spent on Facebook leads to a 5.574 decrease in the self-esteem score of an individual. One possible explanation is that individuals spend a long time looking at others' profiles that are portrayed and over-projected through a positive lens (52). Such practices invariably led to reduced self-actualisation, self-esteem and professional conscientiousness. In contrast, another school of thought argued that the use of social media provides a strong feeling of self-esteem and popularity by infusing self-expression through the value of social capital (53). This ongoing debate brings up the role of educators to regulate the use of social media for their balanced and tailored utility.

## **CONCLUSION**

Using a structured process, we successfully validated the content of the proposed MEeP framework. After incorporating the experts' opinions, the validated MEeP framework incorporated three major constructs: professional values (conformity, benevolence, universalism and integrity), professional behaviours (communication, tolerance and power) and professional identity formation (reflective, conscientious, self-directed and self-actualisation). We transferred the self-awareness competency from behaviour to identity construct. Self-awareness was tagged under 'who am I', making it a highly desirable attribute alongside self-regulation. This validated MEeP framework can assist healthcare professionals in developing and adopting expected competencies in the digital realm.

## **ETHICAL APPROVAL**

Ethical approval was sought from the University Sains Malaysia's Research Ethics Committee (JEPeM) USM/JEPeM/19050291

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