Original Article

Medical Students' Achievement in Elective Posting Using Online Platform Under Movement Control Order During COVID-19 Pandemic

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ABSTRACT

Background

Medical schools worldwide emphasize elective posting (EP) in undergraduate medical curriculum, allowing students freedom to choose a project of their interest. At University Kebangsaan Malaysia (UKM), medical faculty, EP of four-weeks takes place at the end of year-3, where students freely choose project.

Objectives

During COVID -19 pandemic in 2020 under movement control order (MCO), there was a shift in the types of electives undertaken by students, along with shifting of teaching-learning from face-to-face to online.

Method

This study aimed to determine the students' achievement during EP under MCO. It was a retrospective study designed and conducted from October 2020 to September 2021 by examining 122 year-3 medical students' EP performance documents of 488 Padlet journals uploaded weekly to Padlet.com and 122 reflective reports submitted at completion of EP. A qualitative data analysis was done, and a panel of experts verified the outcomes. Appropriate sentences were coded into several themes and subthemes.

Results

Students' achievement in EP was categorized into three major themes: Theme-1: Course Learning Outcomes (CLO) soft skills; Theme-2: Additional soft skills; and Theme-3: Hard skills. Reflective was the main subtheme under CLO soft skill, showing the students' ability to reflect. Adaptability and problem-solving emerged as key skills under theme-2, while media production was noted key skills under theme-3. Despite the imposed restrictions during pandemic with shifting teaching-learning approach, students achieved the skills stated in the CLO of elective course, including additional soft and hard skills.

Conclusion

These findings can be utilized to boost the design and implementation of future elective postings.

Keywords

Elective course; COVID-19 pandemic; Students' achievement; Online, Soft skills; Hard skills.

Medical schools worldwide emphasize elective posting (EP) in undergraduate medical curriculum, allowing students freedom to choose a project of their interest. At university Kebangsaan Malaysia (UKM), medical faculty, EP of one-month takes place at the end of year-3, where students freely choose project. During COVID -19 pandemic in 2020 under movement

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control order (MCO), there was a shift in the types of electives undertaken by students. This study aimed to determine the students' achievement of soft and hard skills during EP under MCO. It was a retrospective study conducted from October 2020 to September 2021 by examining the 122 year-3 medical students' EP performance documents of 488 Padlet journals uploaded weekly to Padlet.com and 122 reflective reports submitted at completion of four weeks of EP. A qualitative data analysis was done, and a panel of experts verifying the outcomes. Appropriate sentences were coded into several themes and subthemes. Students' achievement in EP was categorized into three major themes: Course Learning Outcomes (CLO) soft skills, [2] Additional soft skills, and[3] Hard skills. Reflective was the main subtheme under CLO soft skill, showing the students' ability to reflect. Adaptability and problem-solving emerged as key skills under second theme, while media production was noted key skills under third theme. Despite the restrictions imposed by the pandemic with shifting teaching-learning approach, students achieved the skills stated in the CLO, including additional soft and hard skills. These findings can be utilized to enhance and improve the design and implementation of future elective postings.

INTRODUCTION

Modern medical education increasingly emphasizes the inclusion of elective programs (EP) in the undergraduate curriculum. [1,2]. Electives are courses that students can choose freely as part of their education[1,3]. These courses are designed to prepare students for their future careers by expanding their professional opportunities[1,4], and providing varied learning experiences beyond the fixed curriculum. Electives also complement the core curriculum, allowing students to select courses based on their interests and needs[1,2,3].

Nearly all medical schools now incorporate compulsory EP as part of their undergraduate medical training. Types of electives include global health, project work, career exploration, directed electives, and wellness electives. Global health electives are the most common, especially in medical schools in developed countries[5]. The global health electives provide students with the unique opportunity to engage themselves in healthcare practices across diverse geographical and cultural settings, both locally and globally[5]. These programs provide essential opportunities for medical students to enhance their professional skills and cultural competencies in unique and diverse environments[6]. Many medical schools require these electives, known as international health electives (IHE), that expose students to different healthcare management models compared to their training environment[5]. Students in IHE programs usually travel from a High-Income Country (HIC) to a Middle- or Low-Income Country (LMIC). The benefits include gaining knowledge about diseases not prevalent in ones' own countries, such as tropical diseases, learning about other healthcare systems, dealing with limited resources, and developing cultural competencies[7]. The project work electives allow students to engage in formal projects, ranging from laboratory-based research to clinical audits or clinical research, typically involving full-time attachments at institutions for several weeks[5]. The career choice electives allow students to explore medical and non-medical specialties they are interested in pursuing after graduation[8]. The directed electives are designed for students who may struggle in certain areas of their medical education. These electives offer dedicated time for students to gain further knowledge or clinical skills in identified areas of weakness[5]. Lastly, wellness electives focus on helping students reflect, reassess, and re-engage before entering their final year of medical school. These electives emphasize stress reduction and management techniques[5].

The UKM's undergraduate medical curriculum spans five years, and within this curriculum, the EP is a compulsory module that all medical students must complete. The EP takes place during the semester break between year-3 and year-4. The duration of the EP is four weeks for local placements and two weeks for overseas placements. Students have the flexibility to choose and design their EP projects based on their interests, focusing on various themes, including volunteerism and humanitarian/NGOs, health related skills development such as alternative medicine, pharmacy, physiotherapy, occupational therapy etc., which are not included in their 5 years of medical posting. Students have also the flexibility to choose and design non-health related skills such as: farming and agriculture, business and entrepreneurship, sports, entertainment industry, baking, photography, etc. Therefore, depending on their creativity and effort, students may join any activities, engage in projects, or enroll in courses to develop new skills, all of which must receive approval from the elective posting Programme Committee.

Each student is paired with a faculty supervisor/s who provides guidance, critiques their work, and evaluates their performance throughout the EP course. The EP Course Learning Outcomes (CLO) stated that students at the end of the course are able to learn and apply skills in managing out-campus learning beyond the classroom in aspects such as decision-making, interpersonal communication, time management, and critical thinking. Additionally, the EP allows students to demonstrate their capability to learn new things and complete the assigned task. Furthermore, it enables them to reflect on their experiences gained during off-campus learning, which positively influences their personal development[9].

The COVID-19 pandemic has shifted medical education to online platforms, enabling faculty to connect with students innovatively and ensuring that essential learning outcomes are met effectively[10]. For the elective postings completed amid the COVID-19 pandemic, students were required to adhere to the Movement Control Order (MCO). This situation effectively transformed the landscape of elective options available to them. Under the MCO, UKM implemented strict guidelines for students to conduct their elective projects (EP), emphasizing the need for projects or activities that involved low-risk exposure to COVID-19 whenever possible. With the restrictions on travel, gatherings, and physical contact, students had to choose the EP that complied with MCO guidelines.

As the EP during the COVID-19 pandemic differed from the regular EP, it is crucial to assess how the MCO affected the effectiveness of students' learning and the overall quality of the elective program concerning their personal and professional development. Moreover, these EPs are non-medical electives, less commonly researched than medically based ones. Hence, there is an opportunity to address the existing research gap by analyzing UKM's unique non-medical elective postings. The EP committee of UKM envisioned that medical students should be all-rounders and equipped with various personal and life skills to become competent doctors in the future[11].

The objective of this study was to identify the students' achievement in EP using online platform at UKM under MCO during COVID-19 Pandemic. Specifically, the study aimed to determine both the soft skills and hard skills that students gained through their EP under MCO.

MATERIALS AND METHODS

It was a retrospective study conducted at the medical education department of UKM medical faculty by year-4 medical students during their Special Study Module (SSM) research project placement. The study participants included all 122 year-3 medical students of academic session 2019/2020 at UKM who completed their four weeks course of elective posting (EP) during the COVID-19 pandemic, specifically during the Movement Control Order (MCO) implemented in 2020. The researchers examined the performance documents of elective posting submitted by the participants weekly and at completion of four weeks of EP. It is to mention that, since it was the period of MCO, no elective was done in overseas by the student. The performance documents of EP comprised of (1) students' data, including name, matriculation number and year of study, (2) performance details of the students uploaded to Padlet.com weekly in order to monitor the progress of students over the four weeks of elective course, and (3) reflective report uploaded at the end of four weeks course. The Padlet is an innovative online platform and application that allows students to effectively organize and present information on interactive virtual bulletin boards using a user-friendly drag-and-drop system. With Padlet, learners start with a blank page and can effortlessly add videos, text, links, documents, and images to create a vibrant display of ideas. This dynamic tool promotes real-time collaboration among peers and fosters engaging interactions with instructors, who can provide valuable assessments[12].

Weekly performance details were based on the intended question: "What did I do?" -the materials were mainly texts, images and videos. The reflective reports are based on specific questions such as: (i) "What are your feelings and thoughts on elective project?"- (a brief description of the elective project: what, who, when, where, why); (ii) "What were your greatest strengths and weaknesses while conducting the elective project?" -(a brief discussion on the experience gained during EP and its impact on interpersonal communication); and (iii) "What would you do differently if you were to do this project again?"-(a brief discussion on the application of skills of critical thinking gained from the experience). The reflective reports on EP were submitted at the end of the elective course, along with an e-poster or a 10-minute short video to the UKMFolio, the university's online learning management system. The short video and

e-poster includes the objective, background/ description, activities/ output and conclusion.

Researchers were a group of four year-4 medical students involved with their SSM research project at medical education department of UKM under the guidance of a faculty supervisor. The SSM research extends throughout year-4 and the first seven weeks of year-5. At the beginning of year-4, students are divided into small groups and assigned to a faculty supervisor. They meet weekly to plan and conduct their research. Under the guidance of their supervisors, students select a research topic, perform a literature search, prepare a research proposal, present it in their assigned department, update the proposal further, and submit it for ethical approval. Once obtained the ethical approval, they can collect data, analyse it, write a report, and present their findings at a scientific conference[13]. The SSM research project benefits undergraduate students, positively impacts their confidence levels and interest in scholarly activities; and enhances their ability to work effectively within a group[14].

This research was approved by the UKM Research and Ethics Committee and supported by the Fundamental Grant, Faulty of Medicine UKM, with project code number FF-2021-141, Dated 15 April 2021. After obtaining ethical approval, the researchers collected documentation of the EP, which included Padlet journals from week-1 to week-4, and a reflective report from the UKM learning management system, UKMFolio. A total of 488 Padlet journals and 122 reflective reports were gathered and studied. After sorting these materials, the analysis was done using qualitative data analysis software, ATLAS.ti. Content analysis was the key part of this process, allowing the identification of various themes. A theme is defined as a grouping of similar or recurring content and ideas under a single topic, which aids researchers to answer the research question[15].

Appropriate sentences were assembled into different themes, subthemes and categories based on operational definitions agreed upon by the researchers. Multiple cross-checks were conducted among the research team throughout the process to ensure the accuracy of the quotations. Following this, a panel of two professional experts was assembled to validate the results. The researchers collaborated with the expert panel to revise the operational definitions and the coded quotations as needed. This cycle was repeated several times until a final consensus was reached.

RESULTS

Among the 122 year-3 UKM medical students, whose EP documents were studied, 78 (64%) were females and 44 (36%) were males. Three major themes with various subthemes and categories were identified from the data/ documents, which served as the foundation for the coding process. The first theme was "CLO Soft Skills," which encompassed the soft skills that students were expected to acquire from the course learning outcomes (CLOs) of the elective posting. The second theme, "Additional Soft Skills," which derived inductively from the participants' materials, highlighting soft skills that were not explicitly mentioned in the CLOs. Finally, the third theme, "Hard Skills," was developed inductively, focusing on the hard skills that students demonstrated during the EP.

Table-1 showed the distribution of thematic analysis, where three major themes were identified with their sub-themes and categories.

Table1: Distribution of themes, sub-themes and categories derived from the elective posting.

No.	Theme	Sub-themes	Categories
1	CLO Soft Skill	Reflective	Feelings, Critical reflection, and Conclusion
		Self-directed learning	
		Time management	
		Interpersonal communication	Family members, Peers, Lecturers /Others
		Decision making	Feeling, Critical reflection, Conclusion
		Responsibility	
2	Additional Soft Skill	Adaptability and problem solving	
		Perseverance	
		Planning	
		Patience	
		Confidence	
		Creativity	
		Stress management	
		Respect	
		Cultural appreciation	Chinese, Korean, Spanish, Malay, History of food
		Interpersonal relationship	
		Empathy	

No.	Theme	Sub-themes	Categories
3	Hard Skill	Media	Video production, Book production, Poster production, Photography, Digital illustration, Programming
		Language	Cantonese, English, Japanese, Korean, Mandarin, Spanish, Sign language
		Culinary arts	Cooking
		Handcraft	Embroidery, Crocheting, Knitting, Sewing
		Music	Music instrument
		Visual arts	Painting, Sketching
		Entrepreneurship	Business management and stock market trading
		Health	Health promotion, Meditation
		Sports	Coaching, diving skill, swimming
		Agriculture	Planting, Fishkeeping
		Beauty	Manicure, Makeup, Fashion design
		Performing arts	Magic tricks, Dancing Electrical

Theme 1: CLO Soft Skills

The CLO soft skills were divided into six subthemes, namely reflective, self-directed learning, time management, interpersonal communication, decision-making, and responsibility.

The subtheme reflective, was further divided into three categories: feelings, critical reflection, and conclusion, the subtheme interpersonal communication, was further divided into family members, peers, lecturers and others while decision making was divided into feeling, critical reflection, and conclusion.

Reflective

Reflective is emerged as the main subtheme under Theme-1. All students were demonstrated this skill in their EP materials. They were able to reflect on their feelings, critical reflection and conclusion after having conducted their EP.

> *At first, before I started the stitches, I was very excited as I believe that it will turn outto be pretty, but after I started to do it, I realised it was very tiring and time consuming.*(Student 72; Padlet 2).

Self-directed learning

The EP committee allows students to design and plan their own EP. Students demonstrated self-directed learning skills within their materials in which they were able to set their study objectives and learned from previous information, experience or difficulty:

> *I had to use whatever medium to learn this skill without the help of a professional due to this pandemic which enhanced my learning skills without being spoon-fed.* (Student 52; Reflective report).

Time management

Students were also expected to achieve their weekly targets and respective deadlines for completing tasks as well as submitting the necessary documents. In order to achieve this, they must possess good time management skills, especially when dealing with personal matters throughout their EP. Some of them also started their EP even during their online clinical postings, which would require adherence to a proper schedule:

> *This project makes me better in time management since this project runs concurrently with my surgical posting. During the daytime, I will take surgery and continue with Mandarin lessons at night.* (Student 41; Reflective report).

Interpersonal communication

Even though it was a period of MCO throughout the EP, students could not avoid communicating information, ideas, and emotions with the people around them, including their family members, peers and lecturers. Communication was done in both verbal and non-verbal manners. Student 78 learned to use proper language to communicate through videos:

> *The EP also improves my communication skill. Through this project, I must communicate with my viewers through videos, so it's really important for me to use short and precise sentences that are easily understood by the viewers.* (Student 78; Reflective report)

Decision making

In regards to making a decision, students were quoted to have mentioned gaining decision-making skills throughout their EP, where several choices were presented to them, and they had to learn to make a wise selection in order to achieve a favourable outcome:

> *I learned on how to make the right judgement from a few sources, before I started doingmy tutorial videos, I compared my own recipes*

from a few sources either by browsing through a few websites or through book or asking recipes from my aunt and mum. I compared all of those recipes and do some modifications to it in order to suit my taste and condition. (Student 78; Reflective report)

Responsibility

Students demonstrated the ability to be dependable and reliable during their project, for instance, Student 18 talks about how she learnt to act responsibly when fulfilling the commitments entrusted to her by her superior as a staff of pharmacy during EP:

I should always remember that as a staff of pharmacy I cannot just give the prescription recklessly to the customer and need to consult first from the pharmacist as the pharmacist had acclimated with the different types of drugs and their side effects. (Student 18; Padlet 2).

Theme 2: Additional Soft Skills

Additional soft skills were categorized into eleven subthemes namely adaptability and problem solving, perseverance, planning, patience, confidence, creativity, stress management, respect, cultural appreciation, interpersonal relationship, and empathy. Subtheme Cultural appreciation has five categories. These subthemes and categories were derived inductively based on soft skills students gained from their EP which were not present within the outlined CLOs of elective.

Adaptability & problem solving

The main subtheme that emerged from theme 2 was adaptability and problem solving. Students were coded to demonstrate this soft skill which was not mentioned as part of the original CLO. A few students had problems with their internet connection and they were able to adapt and solve the problem as mentioned below:

I have some difficulty in opening it as my internet is a bit slow when using Facebook. To overcome it, I had to download all the notes and videos so that I can read and watch it offline. (Student 33; Padlet 1)

Perseverance

Perseverance is an important additional subtheme identified. Students mentioned that the elective posting has taught them not to give up despite the issues and challenges they face:

It taught me to not easily give up because while doing this project I needed to do multiple attempts before getting a nice and satisfied outcome. (Student 37; Reflective report)

Planning

Planning was also among the most mentioned by students. They were able to layout a detailed plan on what they would do next, how they would do it, and when to do it in their EP to achieve their objectives:

I planned to do embroidery on plain fabric and transform into a shirt for my elephant doll. This includes aspects of tailoring where measurements of shirt and skill in conducting tailoring machine. And also, not forgetting to create a video of my elective posting. (Student 34; Padlet 3)

Patience

Patience is an important sub-theme emerged here. Students mentioned how they tolerated problems and delays during their EP without becoming annoyed or anxious, for example Students 97 encountered issues inbaking:

I made a mistake when I first started my baking journey because I poured all the sugarin one shot and I whisked for so long to ensure the sugar melt completely. Over- whisking caused the whipping cream to lose the bond that hold the liquid and fat together which resulted in runny whipping cream. This has taught me to be patience and never to fast-forward these seemingly unimportant stages which can make all the difference between a sunken cake and a perfectly risen chiffon cake. (Student 97; Reflective report)

Confidence

Several students had more self-confidence after their EP in which they obtained self-assurance on their capabilities in certain skills. Here is an example:

Throughout this project, I found out more unknown possibilities about myself, overcame various challenges, learnt from mistakes and also boosted my confidence level. (Student 114; Reflective report)

Creativity

Students also mentioned how the EP had nurtured creativity in them since they had to think ofideas to create new things or unique designs as mentioned by Student 16:

> *Besides, by doing embroidery I got to work on my creativity and ideas. For instance, to decide on the colour of the thread to mix and match with the design that I'm working on. It taught me to be more creative and unique.* (Student 16; Reflective report)

Stress management

Regarding stress management, students explained how the EP helped them strengthen their ability to manage their stress to a manageable level throughout the MCO, especially when a lot of them had to go through their clinical postings and EP concurrently:

> *In terms of professionalism, I believe I am able to be more matured in dealing with stress or working under pressure in the future as the whole process of this project indirectly teaches me to develop stable physical, mental and emotions*. (Student 13; Reflective report)

Respect

Some students worked on a project in a group were able to learn to respect others for their feelings and their rights:

> *From this project, it had made me a better person personally as I learned to respect others for the commitment they had to the project, despite their backgrounds and my prior experience with them.* (Student 39; Reflective report)

Cultural appreciation

Despite the MCO, the internet has made it possible for students to learn about other cultures be it language, tradition, food and many more, thus students mentioned how they were able to appreciate other cultures such as Chinese, Korean, Spanish, and Malay:

> *This project of learning Hangeul (Korean alphabet), has also taught me about the Korean culture where the culture of respecting the older and the elders is taken very seriously, both in speech (formal and informal) and in action.* (Student 28; Reflective report)

Interpersonal relationship

Having to do the EP at the comfort of one's home made the students spend more time with their family members and thus developed interpersonal relationships along the way:

> *The thing that I really liked the most is when I can spend most of my times with my family. From this, our family bond becomes stronger than before.* (Student 71; Padlet 4)

Empathy

Some students reported learning to be empathy for example, towards patients:

> *I learn about the importance of congruence and empathy for patients in suffering.*
>
> (Student 38; Reflective report).

Theme 3: Hard Skills

The theme 3 describes the hard skills acquired through the EP of the students. The subthemes under this ranges from media production to performing arts. Students choose the hard skills of media production, language, culinary arts and textile handicrafts, music, visual arts, entrepreneurship, health, sports, agriculture, beauty and performing arts.

Media production

Media Production was the highest subtheme coded which encompassed the skill of video production, e-book production, poster production, photography, digital illustration, and programming. As mentioned by Student 17 on learning video production skills:

> *I also learned editing skills such as cropping, adjusting the speed, voice-over, inserting subtitles, several effects, and background sounds. It was quite challenging as an amateur to edit videos for each of the recipes.* (Student 17; Reflective report)

Language

Language was coded as the second highest since a lot of students took the opportunity to learna new language including Mandarin, Korean, Japanese, Cantonese, Spanish, English and even Sign Language. Students generally described which topic of the language they learned duringthe week:

> *In my second week of learning Mandarin, I learnt about shijian (time). I was able to tell*

time, say o'clock and minutes in Mandarin. (Students 43; Padlet 2)

Culinary arts

Culinary arts also came into the top three hard skills gained where students demonstrated to have gained some kind of culinary skills through their EP.

> *I learned to cook Char kuey teow, Rendang tok Perak, Florentine cookies and ayam masak merah.* (Student 30; Padlet 3)

There are other hard skills that students gained including textile handicraft, music, visual arts, entrepreneurship, health, sports, agriculture, beauty and performing arts. In the textile handicrafts, they learn on the embroidery, crocheting, knitting, and sewing; in music they learn musical instrument; in visual arts they learn painting and sketching. They learn entrepreneurship through business management and stock market trading during their own time at home. Health skills comprising health promotion and meditation; sports categorized to coaching, diving skill, swimming. Agriculture includes planting and fishkeeping while beauty comprising manicure, makeup, fashion design. The performing arts includes magic tricks and dancing.

DISCUSSION

Due to the commencement of MCO on 18 March 2020, the EP of the students was conducted using various methods, adhering to the changing standard operating procedures (SOP) at the time. Hence, in this study, students conducted their EP and learned new knowledge and skills, mostly staying at home using various online platforms. Only a few students did the face-to-face EP by maintaining MCO such as those working at pharmacy, working at restaurant or coaching sports. Students' performance depends mainly on their ability to adhere to their plans to achieve weekly targets. Their respective supervisors monitored the progress and performance of students throughout their EP through the materials submitted by the students including Padlet online journals and reflective reports. This study revealed that the EP's objective is achieved even in the MCO period. The students were able to learn and gain skills in out-campus learning beyond classroom settings, which were non-medical based. They were able to learn new things and complete the assigned task.

CLO Soft Skills

Regarding achieving the CLO soft skills from EP under theme-1, the main subthemes or skills gained were reflective or critical thinking, self-directed learning, time management, interpersonal communication, decision-making, and responsibility. This study revealed that all students were reflective or gained skills in reflection or critical thinking. In reflection or reflective writing, students described their feelings and thoughts, their greatest strengths and weaknesses while conducting this project and what they learned from this EP. Since each student had to reflect on their activities and achievements to produce the materials, it is no surprise that the subtheme "reflective" emerged among all students. In UKM medical faculty, students were taught reflective writing under the Personal and Professional Advancement (PPA) module, which has been integrated into every posting since year-1, with varying reflective writing assignments depending on the different modules and clinical postings in each year[16]. The reflection promoted critical thinking of the students, where they analyzed their past experiences and connected them to future decisions. It also enhanced personal growth and a more profound understanding of the individual. Thus, reflection is important for medical students' personal and professional development[1,17].

In medical education, self-directed learning (SDL) is a key competency for students to learn without direct supervision or instructor guidance. The medical profession requires lifelong learning; therefore, SDL is a necessary characteristic of any medical profession[18]. The effectiveness of SDL relies on students possessing specific abilities such as critical thinking abilities, decision-making skills, and self-confidence[19], with good time management. Again, strong communication skills are vital for effective patient management in clinical medicine[20]. Medical professionals need to possess these critical skills to communicate effectively with patients, families, and the public, which has been directly related to clinical care outcomes[21]. All these skills, such as SDL, time management, interpersonal communication, and decision-making, were well achieved through EP.

Additional Soft Skill

Facing the new norm of online learning, students learned adaptability, perseverance, planning, patience,

confidence, creativity, stress management, respect, cultural appreciation, interpersonal relationships, and empathy. All these are important for medical students to be future doctors. Since EP was conducted during the first phase of MCO, many new challenges were faced by the students, requiring rapid adaptability skills to suit the pandemic circumstances. Online learning was the new norm then, and some students felt that adapting to the virtual learning style was challenging. Many students had difficulty joining their online courses synchronously or faced difficulty in 'real-time' meetings or gatherings, either virtual or physical by the instructors and students simultaneously, and had to opt for asynchronous learning. The technological challenges with poor Wi-Fi, unsuitable camera position or other problems enhances the difficulty that compels them to find a solution. Thus, they had to implement skills of adaptability, perseverance, planning, patience, stress management, interpersonal relationships, and respect that ultimately make them confident and creative. The adaptation skill was in line with a study showing that educators would opt for asynchronous learning, uploading their learning materials online if they or their students had a poor internet connection[22], and accessing materials at their own pace. Adaptability is also required in other cases also such as learning language. This study revealed that some non-Chinese students while learning the Chinese language, had problems practicing and conversing with the new language they learnt, as most sessions were asynchronous. Hence, they devised solutions and initiatives to practicing with their Chinese friends through video calls once a week. Hence, adaptability skills have been deemed an important aspect among medical students, especially after the pandemic, requiring them to think out of the box when facing circumstances[23]. Cultural appreciation was extracted from the EPs conducted at home via online platforms, such as learning languages, textile handicrafts, and music.

Hard Skills

Among the hard skills, several emerged: media production, language, culinary arts or cooking, textile handicraft, music, visual arts, entrepreneurship, health, sports, agriculture, beauty and performing arts. Media production was an important hard skill that was identified here. Students were required to produce a final project for their EP, either a 10-minute video or an e-poster. While some tech-savvy students were well-versed in information technology (IT), based on the findings many students expressed their first video editing experience with no previous background knowledge by using various available applications. The students had to learn how to perform voice-overs, add subtitles and video effects, and publish them, which cost them hours. With the ever-increasing trend in the use of videos in health education, video production skills are undoubtedly important for future health professionals to acquire to improve its quality better and maximize its benefits to medical students in terms of clinical reasoning and collaborative learning skills[24,25]. Other than video production, some students also took the initiative and learnt to produce e-books of the recipes they picked up throughout their EP project. Some students gained the skills of photography, digital illustration and programming. These skills can one day be used by medical practitioners to better engage with their social media audience and combat false medical information from untrustworthy sources.

The hard skill 'Language' is another important sub-theme identified here. Students explored different languages such as Cantonese, English, Japanese, Korean, Mandarin, and Spanish; some even ventured into sign language. The language variety could be observed as Malaysia is a multiethnic country, consisting mainly of Malay (58%), Chinese (22.6%), Indian (6.6%), other Bumiputra 4.4% and others 7.7 % [26]. The different languages chosen by most students during EP would help them to better interact with the patients in hospitals and clinics in Malaysia with its multi-ethnicity population; for example, Mandarin and Cantonese language can be used for Chinese patients. It is widely accepted that the language discordance between patients and physicians negatively impacts the health outcomes and quality of care in the healthcare system worldwide. In such cases, patients experience a diminished sense of partnership, reduced empathetic responses, weaker rapport establishment, less respectful communication, and feel that the physician is less concerned about them[27,28]. As future doctors in Malaysia, their ability to speak and communicate multi-lingually will help them understand patients better and deliver a better quality of care to the patients.

Culinary arts or cooking was another important hard skill. A study in the US reported that only 45%, 35% and 20% of first-year medical students perceived themselves as good, average, and poor in cooking, respectively. Among them, 85% of students believe it is important for physicians to know cooking skills, and 95% want to learn more about cooking. All of them believe that it is important for physicians to have nutritional knowledge[29]. Therefore, it is not surprising that most UKM medical students took the opportunity to learn cooking via EP. While cooking skills might not seem important for medical students at first glance, the study by Sugimoto described how medical students were not formally exposed to much nutrition knowledge in medical schools. Thus, it is a concern how they could effectively advocate proper diet in patients, especially for the primary prevention of diseases[29].

Continuity of medical education around the world was crucial to prepare future medical graduates during COVID -19 pandemic and forced educators and students to shift from face-to-face teaching-learning approach to online teaching-learning approach[30]. Under MCO during COVID -19 pandemic, students were found to have learned and acquired a variety of skills, such as textile handicrafts, where they learned embroidery, crocheting, knitting, and sewing using online resources. They also explored music and visual arts, including painting and sketching, along with beauty-related skills like manicures, makeup, and fashion design. Additionally, students engaged in performing arts such as magic tricks and dancing. Other identified hard skills in their EP included entrepreneurship, health, sports, and agriculture. Some students even managed to work face-to-face while adhering to MCO guidelines, undertaking roles in pharmacies, restaurants, and coaching squash. Overall, developing these non-medical skills will help students become well-rounded individuals in real life. The ongoing efforts by the institutions, faculties, and students to overcome the deficits during the era of COVID-19 transformed medical education around the world into a whole new level[30].

Limitation of the Study

The retrospective design of the study and absence of a control group might not truly reflect on the EP course effectiveness. There was no previous study on the EP prior to the COVID-19 pandemic, thus this study was unable to compare the skills achieved by the students during this pandemic period. Reliability of the self-assessments through reflective writing by the students might be depends on how well-versed students translated their experience into writing. Even certain soft skills might be hard to describe through text. Thus, future studies should look into conducting a similar study outside of pandemic conditions to determine whether the MCO had any effect on the efficiency of the course.

CONCLUSION

Despite the challenges posed by the COVID -19 pandemic during the first phase of the MCO, medical students at UKM using online platform successfully achieved and developed the soft skills outlined in the CLO of their EP. The soft skills included decision-making, interpersonal communication, time management, and critical thinking. Furthermore, many students achieved the development of additional soft skills such as adaptability, perseverance, planning, creativity, stress management, and cultural appreciation. The most notable hard skill achieved during their elective programs was the production of medias such as videos and e-posters. Other hard skills developed included culinary arts /cooking and various languages, such as Cantonese, Japanese, Korean, and Spanish. Some students even explored sign languages. This study provides insights into how students effectively acquired both soft and hard skills during a time when they were primarily confined to their homes and achieved the learning through online platforms. It was clear that students were able to find the necessary resources and materials to meet their learning objectives, with some soft skills being more prominently demonstrated than others. As medical education continues to evolve, it is essential to regularly assess the quality of the curriculum, especially in elective courses. Course designs should be improved based on findings from such studies to produce versatile and multi-skilled future medical graduates.

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Conflict of interest

The authors declare that there are no conflicts of interest.

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Authors' contribution

Rahman NHA, Omar AH, Zuraimi UH, Letchuman PM, Hadzir R: *Conception, design, initial drafting.*

Bujang SM, Abdullah SR, Jasman MH, Salam A: *Analysis and review of manuscript.*

Salam A, Rahman NHA: *Literature review, Critiques for important intellectual content and finalizing the manuscript*

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