

EVALUATION OF INTERPROFESSIONAL EDUCATION (IPE) PROGRAM IMPLEMENTATION IN INDONESIA

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ABSTRACT

Interprofessional education (IPE) was introduced in Indonesia in 2011.1 The government, in this case, the Ministry of Education and Culture through HPEQ (Health Professional Education Quality), a unique program from the Directorate General of Higher Education in 2011, has conducted several studies in preparation for the implementation of IPE, including "Interprofessional Education in Health Science Education in Indonesia." However, the implementation of IPE in Indonesia is still minimal. The basic principles of IPE are collaboration, interaction, directed-group learning, reflective learning, applied learning, and egalitarian equality between health professions in the learning process. IPE was introduced in Indonesia in 2011 through HPEQ and is used as one of the operational principles of the LAM-PTKes accreditation agency. However, until now, IPE implementation in Indonesia is still at a very early stage, limited, and tends to be sporadic depending on the capabilities and commitment of existing institutions. Barriers to IPE implementation in Indonesia can be sourced from institutional factors, teaching staff, students, curriculum, and socio-cultural factors.

Keywords: Interprofessional Education, Program Implementation

I. PRELIMINARY

Interprofessional education (IPE) was introduced in Indonesia in 2011.1 The government, in this case, the Ministry of Education and Culture through HPEQ (Health Professional Education Quality), a unique program from the Directorate General of Higher Education in 2011, has conducted several studies in preparation for the implementation of IPE, including "Interprofessional Education in Health Science Education in Indonesia." This study shows that a pilot model of IPE learning in Community-Based Health Care was first

implemented in Jakarta in 2012. The pilot model was followed by students from various fields of health professions, such as medicine, nursing, pharmacy,

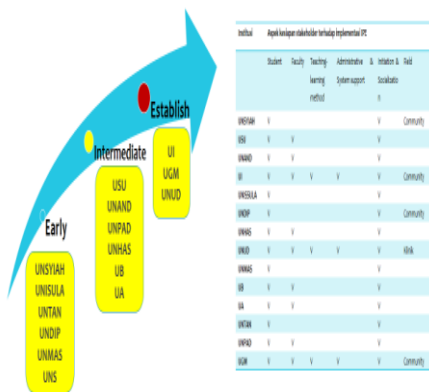
However, the implementation of IPE in Indonesia is still minimal. Data from the Nusantara Health Collaborative held in 2014 by HPEQ Student and the Indonesian Young Health Professionals' Society (IYHPS) states that there are three clusters of health institutions in Indonesia based on IPE implementation. The clusters are (1) established (UI, UGM, UNUD), (2)

intermediate (USU, UNAND, UNPAD, UNHAS, UB, and UA), and (3) early (UNSYIAH, UNISULA, UNTAN, UNDIP, UNMAS, and UNS). The difference between the three institutional clusters lies in students' readiness, institutional readiness, teaching methods, administrative support, initiation, and socialization that have been carried out as a form of preparation and implementation of IPE implementation.

(Data source Nusantara Health Collaborative, HPEQ, Ministry of Higher Education and Research and Technology, 2014)

Other health institutions have not shown any implementation activities, even though they have more than two health study programs/faculties. Syahrizal said that institutions that have implemented IPE are generally located on the island of Java, for example, UI, UGM, UMY, UNPAD, and UII. Meanwhile, institutions located outside Java have not or at least shown any activity towards implementing IPE. 3 Soemantri stated that the implementation of IPE in Indonesia is still at a very early stage, not yet organized nationally, tends to be sporadic depending on the ability and commitment of the institution. They are, moreover, existing health professionals. The readiness of institutions and students towards IPE is also a significant influencing factor.⁴

IPE in Indonesia, Institutional Readiness



Various studies regarding the implementation of IPE in Indonesia that we have successfully summarized are as shown in the following table:

No	Researcher Name	Year	Location	Subject	Research focus	Research result
	Academic (students and teaching staff)					
1	Arif Eko Yuniawan, Wastu Adi Mulyono, Dwi Setiowati Source: Yuniawan AE, et al. Perception and readiness of	2015	General Sudirman University, Purwokerto	General Sudirman University FKIK teaching staff from medical, public health, nursing,	Arif Eko Yuniawan, Wastu Adi Mulyono, Dwi Setiowati	2015

	lecturers towards interprofessional learning. Sudirman Journal of Nursing. 2015			dentistry, pharmacy, and nutrition study programs.		
2	Endang Lestari, Renè E. Stalmeijer, Doni Widyandana, Albert Scherbier <u>Source:</u> Lestari, et al. Understanding students' readiness for interprofessional learning in an Asian context: A mixed-methods study. BMC Medical Education. 2016. Available from DOI 10.1186/s12909-016-0704-3	2016	Semarang and Yogyakarta	Health study program students (medicine, dentistry, nursing, and midwifery)	Students' perceptions and readiness to implement IPE and the influencing factors.	Medical students show the best readiness compared to other health study programs. Students' perceptions and readiness of IPE are influenced by academic achievement, the origin of the study program, intrinsic motivation, and activity in student organizations.
3	Titi Savitri Prihatingsih, Widyandana, Elsi dwi Hapsari, SIti Helmiyati, Aziz Jati Nur Nanda <u>Source:</u> Prihatiningsih TS, et.al. A lesson learned: Implementation of interprofessional education in disaster management at the Faculty of Medicine, Gadjah Mada University, Indonesia. Journal	2017	Gadjah Mada University	Student of health study program (medicine, nursing, and nutrition) Faculty of Medicine UGM	Exploration of the effectiveness of IPE implementation in the context of emergency disaster management	The disaster emergency management module delivered through the IPE approach has effectively improved knowledge, communication skills, and collaboration among students.

	of Interprofessional Education & Practice. 2017. Available from https://doi.org/10.1016/j.xjep.2017.10.001					
4	Dyeri Susanti, Hesti Wulandari, Ryka Juariah, Sari Puspa Dewi Source: Susanti D, et.al. The application of Interprofessional Education (IPE) in the class of mothers of children under five by students of health workers to improve the attitude of mothers towards the health of children under five in Cimahi City. JSK. 2017	2017	Cimahi, West Java	Mothers with toddlers aged 24-59 months	The impact of changes in mother's attitude towards the health of children under five on the implementation of IPE	There was an increase in the positive attitude of mothers towards the health of children under five due to the implementation of IPE by students of midwifery, nursing, nutrition, and environmental health.
5	Endang Lestari, Renèe E. Stalmeijer, Doni Widyandana, Albert Scherbier Source: Lestari E, et al. Understanding the attitude of health care professional teachers toward interprofessional health care collaboration and	2018	17 health education institutions in Central Java Province	Teaching staff at 17 health education institutions in Central Java Province	Exploration of perceptions and attitudes of teaching staff towards the implementation of IPE and the influencing factors.	The teaching staff showed different attitudes and perceptions towards implementing IPE and IPCP. This is due to 1) the different perceptions of each health profession towards the needs of patients, 2) the inequalities of participation in decision making, 3) the lack of

	education in a Southeast Asian country. Journal of Multidisciplinary Healthcare. 2018. Available from DOI:10.2147/JMD.H.S178566					interpersonal interaction, 4) the overlapping roles and responsibilities between health professions. Nursing lecturers show a better positive attitude towards IPE and IPCP than other study programs.
6	Tri Nur Kristina, Sudaryanto, Fatikhu Yatuni Asmara, Nuryanto, Firman Wirakusumah, Yoni Syukriani <u>Source:</u> Kristina TN, et.al. Community-based health-professions interprofessional education: A collaborative and sustainable model. The Indonesian Journal of Medical Education. 2018	2018	Diponegoro University, Semarang	Students of S1 Medicine, S1 Nursing, S1 Nutrition Studies Program (semester 6)	Development and validation of IPE competency-based learning models	The PBK-IPE model is recommended for students who already have sufficient competence to be applied in the community (semester 6). Further study and validation of the model still need to be done after implementation.
7	Abt Randita, W Widyandana, Mora Claramita <u>Source:</u> Randi ABT, et al. IPE-COM: a pilot study on interprofessional learning design for medical and midwifery students. Journal of Multidisciplinary Healthcare. 2019.	2019	Eleven Maret University, Surakarta	Students of the medical and midwifery study program at Sebelas Maret University, Surakarta	Exploration of the impact of community-based IPE implementation on collaborative competence (communication, collaboration, understanding of roles and responsibilities, teamwork, and	The implementation of community-based IPE has proven to increase collaborative competencies, especially teamwork and collaboration.

	Available from DOI:10.2147/JMD H.S202522				conflict management)	
8	Dedy Syahrizal, Teuku Renaldi, Sukma Wulan dianti, Noraliyatun Jannah, R Rachmah, Sarah Firdausa, Azizah Vonna <u>Source:</u> Dedy Syahrizal, et.al. The differences in perceptions of interprofessional education among health profession students: The Indonesian experience. Journal of Multidisciplinary Healthcare. 2020	2020	Syiah Kuala University , Aceh	Students of Syiah Kuala University health study program (medicine, dentistry, psychology, nursing, and pharmacy)	Health student perceptions of IPE implementation	The majority of students showed a negative perception of IPE implementation, except for students of the pharmacy study program.
9	Santi Purna Sari, Diantha Soemantri, Dian Ayubi, Evi Matha, Hanny Handiyani, Ardi Findyartini <u>Source:</u> Sari SP, et al. Indonesian health professions students' perceptions toward an interprofessional education program; Finding after five years of implementation. Makara J Health	2020	University of Indonesia	Undergraduat e students of the University of Indonesia Health Sciences	Exploration of student perceptions after five years of IPE program implementation (2013-2017)	Students' perception of IPE is quite good. The influencing factor is a comprehensive instructional design, and the IPE principles embedded in the curriculum are excellent.

	Res. 2020;24(2):104-113. Available from DOI: 10.7454/msk.v24i2.1207					
10	Sri Darmayani, Ardi Findyartini, Natalia Widiasih, Diantha Soemantri Source: Darmayani S, et al. Stereotypes among health professions in Indonesia: an explorative study. Korean Journal of Medical education. 2020. Available from https://doi.org/10.3946/kjme.2020.180	2020	University of Indonesia	University of Indonesia students and faculty members of the health sciences group	Exploration of perceptions of students and teaching staff on stereotypes and the impact of stereotypes on the implementation of IPE	Both positive and negative stereotypes can affect the implementation of IPE. Stereotypes can be overcome through increasing understanding of the role of other health professions, the internal competence of the health profession, and the implementation of interprofessional education.
	Clinical (health worker)					
1	Adji Prayitno Setiadi, Yosi Wibowo, Fauna Herawati, Sylvi Irawati, Eko Setiawan, Bobby Presley, M. Arif Zaidi, Bruce Sunderland Source: Setiadi AP, et al. Factors contributing to interprofessional collaboration in Indonesian health	2017	East Java	Health workers who work in health centers in 4 districts and cities of East Java Province	Exploration of factors influencing interprofessional collaboration in Indonesian health centers	Interprofessional collaboration in health centers is influenced by personnel level (interaction between health workers), organizational level (health center environment), and health system (government policy).

	centers: A focus group study. Journal of Interprofessional Education & Practice. 2017. Available from http://dx.doi.org/10.1016/j.xjep.2017.06.02					
2	Ardi Findyartini, Daniel Richard Kambey, Rezki Yeti Yusra, Amandha Boy Timor, Candrika Dini Khairani, Daniar Setyorini, Diantha Soemantri Source: Findyartini A, et al. Interprofessional collaborative practice in primary healthcare settings in Indonesia: A mixed-methods study. Journal of Interprofessional Education & Practice. 2019. Available from https://doi.org/10.1016/j.xep.2019.100279	2019	Depok	Health workers at the first level health service facilities in Depok	Identify health workers' perceptions of IPCP and explore challenges and barriers to IPCP, for example, socio-cultural	Respondents' perception of IPCP is good. Factors that contribute to the implementation of IPCP are at the individual, group, and organizational levels.
3	Diantha Soemantri, Daniel Richard Kambey, Rezki Yeti Yusra, Amandha Boy Timor,	2019	Eleven Maret University Teaching Hospital	Health workers at Sebelas Maret University Teaching	Exploration of IPCP implementation and influencing factors in newly	The basic concept of professional collaboration must be implemented as early as possible so that IPCP

	<p>Candrika Dini Khairani, Daniar Setyorini, Ardi Findyartini</p> <p>Source: Soemantri D, et.al. The supporting and inhibiting factors of interprofessional collaborative practice in a newly established teaching hospital. <i>Journal of Interprofessional Education & Practice</i>. 2019; 15: 149-156. Available from DOI: 10.1016/j.xjep.2019.03.008</p>			Hospital	established teaching hospitals.	implementation can run well.
4	<p>Rezki Yeti Yusra, Ardi Findyartini, Diantha Soemantri</p> <p>Source: Yusra RY, et al. Healthcare professionals' perceptions regarding interprofessional collaborative practice in Indonesia. <i>Journal of Interprofessional Education & Practice</i>. 2019; 15:24-29. Available from http://dx.doi.org/10.1016/j.xjep.2019.01.005</p>	2019	Cipto Mangunku sumo Hospital Jakarta	Health workers at RSCM	Exploration of health workers' perceptions of interprofessional collaboration practices at RSCM	Factors that mainly influence the practice of interprofessional collaboration at RSCM are the health profession, age, and length of time worked. Nurses' junior staff with short working hours showed more significant barriers in implementing IPCP than professionals and senior staff who worked longer hours.

5	Ketut Ernawati urges Source: Ernawati DK. Collaborative competencies in the public health center in Indonesia: An explorative study. Journal of Interprofessional Education & Practice. 2020. Available from https://doi.org/10.1016/j.xjep.2019.100299	2020	Bali	Doctors, nurses, midwives, and pharmacists at the Denpasar, Gianyar, and Tabanan health centers	Exploration of the influence of cultural perceptions, knowledge, skills, and attitudes towards interprofessional collaboration in the context of patient safety	There are four main competencies identified as critical success factors for interprofessional collaboration: communication, coordination, leadership, and understanding of the roles and responsibilities of other professions.
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II. OBSTACLES TO IPE IMPLEMENTATION IN INDONESIA

Various obstacles become obstacles in the implementation and development of IPE in Indonesia. Prihatiningsih stated that the overcrowded curricula of health education, lack of institutional and administrative support, and financial constraints became obstacles in the implementation and development of IPE in Indonesia. Students, teaching staff, learning outcomes, availability of learning experiences in real-world settings, and learning infrastructure influence the implementation and development of interprofessional education.

Another obstacle stated by Kristina is related to the IPE learning strategy, which is still very limited. It was stated that, in general, IPE learning strategies were still focused on seminars, workshops, and simulations. Institutions should implement IPE into various methods, stages, and

learning settings to better implement better interprofessional education better.⁷ Lestari, in a study of 17 health institutions in Java, stated that the main obstacle is the characteristics of the teaching staff. To become competent IPE lecturers, lecturers are required to have a commitment, positive attitude, and adequate knowledge of interprofessional collaboration. There are different perceptions regarding IPC (interprofessional collaborative), such as lack of knowledge and respect for work team members, which can be obstacles in implementing IPE. Health workers who have not received interprofessional training or education tend to ignore interprofessional collaboration in health services. The characteristics of specific professional education that emphasize independence in health services, such as medicine, dentistry, and midwifery, are also significant obstacles to the successful implementation of IPE. It is stated that nursing has a more positive

attitude than other professions towards IPC and IPE. This is due to the characteristics of nursing education that require continuous collaboration with other parties. The social hierarchy that characterizes Southeast Asian society is also a factor that hurts IPE implementation. In this type of society, there is an assumption that doctors have a higher position than other health professionals (nurses, midwives). Randi said that institutions with rigid PBL curricula tend to find it challenging to implement IPE properly due to problems with schedules, classes, established separate clinical placement systems, a large number of students, institutional policies, and different professional accreditation requirements, as well as the selection of appropriate assessment methods.^{8,9}

III. DISCUSSION

The implementation of IPE in Indonesia since it was introduced in 2011 has not yet been implemented evenly and adequately. IPE tends to be sporadic and centered on established institutions compared to other institutions due to limited resources and depending on the commitment of the existing institution and teaching staff.

a. Barriers to IPE implementation in Indonesia

The obstacles that arise in the implementation of IPE in Indonesia can be grouped into five, namely

1. Institution

Lack of leadership commitment to institutional policy is a significant obstacle in the implementation and development of IPE. In addition, the administrative system,

infrastructure (availability of classrooms, other supporting facilities), and finance are also obstacles in the implementation of IPE.

2. Teacher

Teaching staff who do not understand the roles and responsibilities of other professions and the importance of collaboration can be an obstacle to the implementation of IPE. Teachers educated in the nonprofessional concept also find it tricky to apply IPCP/IPE. The professional educational background that emphasizes aspects of independence, such as medicine, dentistry, and midwifery, and wrong perceptions and negative attitudes towards certain professions also make IPE implementation difficult.

3. College student

With collaboration, the number of students included in a program becomes larger. This, of course, can cause various problems, especially in scheduling, adjusting learning methods, and managing conflicts that may arise. Students who do not yet understand the basic concepts of collaboration will find it challenging to engage in IPE implementation. In addition, there is a tendency to misperceive one of the health professions; for example, medical students will be considered more intelligent than other health students, which is also a significant obstacle in implementing IPE.

4. Curriculum

From the aspect of the curriculum that can be an obstacle to the success of IPE implementation is a rigid curriculum with a tight schedule making it difficult to implement IPE programs with other professions, rigid, overlapping learning

methods, and inappropriate assessment methods also make it challenging to implement and develop IPE.

5. Culture

A socio hierarchy that considers a health profession to be more prestigious than other professions will lead to a marginalization of certain professions. This, of course, contradicts the principle of egalitarian learning in IPE.

b. Suggestions for improvement

Several recommendations can be a solution to the obstacles to implementing IPE in Indonesia, namely:

1. Institution

The success of IPE implementation is determined by a high commitment and a supportive environment for the implementation of interprofessional education. It is necessary to increase awareness of the importance of implementing IPE on an ongoing basis, especially for institutions still in the intermediate, early stages, or that have not shown any activity towards implementing IPE. By increasing awareness of the importance of implementing IPE, it is hoped that it can motivate institutions to implement IPE on an ongoing basis.

Institutions can develop interprofessional panels in every educational vehicle to implement IPE better. The panel consists of educators who have received previous interprofessional training. Institutions can collaborate with other institutions, especially establishing clusters, to benefit from training and implementing interprofessional learning activities.

2. Teacher

The IPE educator development program teaches staff to develop knowledge and skills in the interprofessional field. In this program, teaching staff will be provided with curriculum design, instructional material creation, teaching, and evaluation in an interprofessional context.¹¹

3. College student

Institutions need to provide students with a continuous understanding of the basic concepts and benefits of IPCP/IPE. With a good and correct understanding of IPCP/IPE, it is hoped that students' commitment to the implementation of interprofessional education can be obtained. Sri Darmayani mentioned that harmful stereotypes could be overcome if students understand well the basic concepts of interprofessional collaboration

4. Curriculum

Integrating the basic concepts of education and interprofessional collaboration from the beginning of education using various active learning approaches, such as community-based learning, case discussions, project-based learning, and role-play simulations, will make IPE/IPCP more embedded for students. The use of technology, such as virtual classes virtual simulations, can be a solution to managing a busy schedule with a large number of students in the IPE learning process.

5. Culture

Clarita recommends using the TRI-O guidelines to overcome hierarchical social barriers to IPE implementation. TRI-O is a guide to communication skills in an interprofessional context, which consists of

Open for collaboration, Open for information, and Open for discussion. This guide puts forward the principles of interprofessional collaboration, namely equality, two-way communication, mutual trust, and teamwork.¹³

IV. CONCLUSION

Interprofessional education (IPE) is a learning method approach where two or more students with other health professional backgrounds sit together simultaneously to interact and learn from each other to increase collaboration and health outcomes. The basic principles of IPE are collaboration, interaction, directed-group learning, reflective learning, applied learning, and egalitarian equality between health professions in the learning process. IPE was introduced in Indonesia in 2011 through HPEQ and is used as one of the operational principles of the LAM-PTK accreditation agency. However, until now, IPE implementation in Indonesia is still at a very early stage, limited, and tends to be sporadic depending on the capabilities and commitment of existing institutions. Barriers to IPE implementation in Indonesia can be sourced from institutional factors, teaching staff, students, curriculum, and socio-cultural factors. Recommendations that can be put forward to overcome obstacles are increasing institutional leadership commitment to the implementation of IPE, interprofessional educator development program for teaching staff, providing students with an understanding of the basic concepts of IPE/IPCP on an ongoing basis; implementing IPE as early as possible from

the beginning of education with a variety of learning and assessment methods; and the use of technology to overcome the busy schedule and a large number of students in IPE; and improving interprofessional communication with the TRI-O guidelines.

Recommendations that can be put forward to overcome obstacles are increasing institutional leadership commitment to the implementation of IPE, interprofessional educator development program for teaching staff, providing students with an understanding of the basic concepts of IPE/IPCP on an ongoing basis; implementing IPE as early as possible from the beginning of education with a variety of learning and assessment methods; and the use of technology to overcome the busy schedule and a large number of students in IPE; and improving interprofessional communication with the TRI-O guidelines. Recommendations that can be put forward to overcome obstacles are increasing institutional leadership commitment to the implementation of IPE, interprofessional educator development program for teaching staff, providing students with an understanding of the basic concepts of IPE/IPCP on an ongoing basis; implementing IPE as early as possible from the beginning of education with a variety of learning and assessment methods; and the use of technology to overcome the busy schedule and a large number of students in IPE; and improving interprofessional communication with the TRI-O guidelines. Provide a continuous understanding of the basic concepts of IPE/IPCP to students; implement IPE as early as possible from the

beginning of education with a variety of learning and assessment methods; and the use of technology to overcome the busy schedule and a large number of students in IPE; and improving interprofessional communication with the TRI-O guidelines. Provide a continuous understanding of the basic concepts of IPE/IPCP to students; implement IPE as early as possible from the beginning of education with a variety of learning and assessment methods; and the use of technology to overcome the busy schedule and a large number of students in IPE; and improving interprofessional communication with the TRI-O guidelines.

REFERENCE

1. Clarita M, et al. Interprofessional communication in a socio-hierarchical culture: development of the TRI-O guide. *Journal of Multidisciplinary Healthcare*. 2019; 12, p 191-204
2. Dedy Syahrizal, et.al. The differences in perceptions of interprofessional education among health profession students: The Indonesian experience. *Journal of Multidisciplinary Healthcare*. 2020
3. Damayanti S, et al. Stereotypes among health professions in Indonesia: an explorative study. *Korean Journal of Medical education*. 2020. Available from <https://doi.org/10.3946/kjme.20.20.180>
4. Findyartini A, et al. Interprofessional collaborative practice in primary healthcare settings in Indonesia: A mixed-methods study. *Journal of Interprofessional Education & Practice*. 2019. Available from <https://doi.org/10.1016/j.xjep.2019.100279>
5. Lestari, et al. Understanding students' readiness for interprofessional learning in an Asian context: A mixed-methods study. *BMC Medical Education*. 2016. Available from DOI 10.1186/s12909-016-0704-3
6. Lestari E, et al. Understanding the attitude of health care professional teachers toward interprofessional health care collaboration and education in a Southeast Asian country. *Journal of Multidisciplinary Healthcare*. 2018. Available from DOI:10.2147/JMDH.S178566
7. Nusantara Health Collaborative, HPEQ, Ministry of Higher Education and Research and Technology, 2014
8. Concerning TS, et.al. A lesson learned: Implementation of interprofessional education in disaster management at the Faculty of Medicine, Gadjah Mada University, Indonesia. *Journal of Interprofessional Education & Practice*. 2017. Available from <https://doi.org/10.1016/j.xjep.2017.10.001>
9. Pien LC, et al. Interprofessional educator development. *Perspective Medical Education*. 2018;7:p.214-8. Available from <https://doi.org/10.1007/s40037-018-0418-9>

10. Rahmadayani E, et al. Implementation of Interprofessional Education at the Faculty of Medicine, Udayana University. Medical Education Study Program, Faculty of Medicine, Udayana University. 2016
11. Randi ABT, et al. IPE-COM: a pilot study on interprofessional learning design for medical and midwifery students. *Journal of Multidisciplinary Healthcare*. 2019. Available from DOI:10.2147/JMDH.S202522
12. Soemantri D, et.al. The supporting and inhibiting factors of interprofessional collaborative practice in a newly established teaching hospital. *Journal of Interprofessional Education & Practice*. 2019; 15: 149-156. Available from DOI: 10.1016/j.xjep.2019.03.008
13. Kumar, S. (2022). Strategic management of carbon footprint using carbon collectible non-fungible tokens (NFTS) on blockchain. *Academy of Strategic Management Journal*, 21(S3), 1-10
14. Kumar, S. (2021). Review of geothermal energy as an alternate energy source for Bitcoin mining. *Journal of Economics and Economic Education Research*, 23(1), 1-12
15. Roy, V., Shukla, P. K., Gupta, A. K., Goel, V., Shukla, P. K., & Shukla, S. (2021). Taxonomy on EEG Artifacts Removal Methods, Issues, and Healthcare Applications. *Journal of Organizational and End User Computing (JOEUC)*, 33(1), 19-46. <http://doi.org/10.4018/JOEUC.2021010102>
16. Shukla Prashant Kumar, Sandhu Jasminder Kaur, Ahirwar Anamika, Ghai Deepika, MaheshwaryPriti, Shukla Piyush Kumar (2021). Multiobjective Genetic Algorithm and Convolutional Neural Network Based COVID-19 Identification in Chest X-Ray Images, *Mathematical Problems in Engineering*, vol. 2021, Article ID 7804540, 9 pages. <https://doi.org/10.1155/2021/7804540>
17. Sari SP, et al. Indonesian health professions students' perceptions toward an interprofessional education program; Finding after five years of implementation. *Makara J Health Res*. 2020;24(2):104-113. Available from DOI: 10.7454/mak.v24i2.1207
18. Yusra RY, et al. Healthcare professionals' perceptions regarding interprofessional collaborative practice in Indonesia. *Journal of Interprofessional Education & Practice*. 2019; 15:24-29. Available from <http://dx.doi.org/10.1016/j.xjep.2019.01.005>