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Taecher Education Institute of Malaysia (IPGM) Lecturers Aspirations in Enhancing Capabilities in The Digital Innovation Field

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Abstrak

Digital innovation in the education field is a necessity nowadays to face the challenges of the era of Industrial Revolution 5.0. With the threat of the Covid-19 pandemic, digital innovation is also seen as a driver to learning reform in new norms that make information technology an empowerment medium for educational institutions around the world. Teacher Education Institute of Malaysia (IPGM) is also optimistic about cultivating digital innovation among lecturers to form a circle of educational enablers who are capable of implementing digital innovation for the exposure of prospective teachers (students). Thus, this survey study was conducted to identify the aspirations of IPGM lecturers to enhance their capabilities in implementing digital innovation. Subjective items for open-ended questions were prepared using Google Forms. The findings of this study showed that some of the IPG lecturers' aspirations in enhancing their capabilities in the digital innovation field included theiraspirations for innovation, training, funding assistance, infrastructure assistance and commercialization assistance.

Kata Kunci: Digital Innovation, Aspiration, IPG Lecturers

I. INTRODUCTION

The changing phase of human life system is in line with the development of the Industrial Revolution 4.0 era [1], and at present the country is entering a more challenging Industrial Revolution 5.0 era especially for information technology. Based on the Malaysian Digital Report in 2017, the internet usage as life necessities is very significant today following the spread of the Covid-19 epidemic. It is also a necessity in all aspects of life [2]. The wave of new technologies is witnessing changes and innovations of various digital tools to meet the current needs of digital consumers (Ilias and Ladin, 2018). The development of several aspects of digital innovation, such as Advanced Management Program (CPS), Big Data, Internet of Things (IoT) and Internet Industry, is part of the paradigm that should be applied especially in the education field today. Towards Industrial Revolution 5.0, readiness in digital innovation involving human, machine and technological collaboration is in line with the nation's goals towards Shared Prosperity Vision 2030 which also targets ecosystem development in all areas including industry and social capital.

Several aspects of the development of the industrial revolution can be seen based on gradual innovations in digital fields such as cloud computing, IoT, 5D printing, systems integration, augmented reality, autonomous robots and renewable technologies. Malaysia as a developed country among developing countries is in a Big Data pool thatdepends on trading countries (great powers in economics and politics); thus, it is necessary to take integrated steps in pursuing this industrial revolution changes. The education field needs to be aligned with developmental goals that are evolving towards digital learning competencies.Empowerment in digital innovation in education is very important especially nowadays(learning in new norms) [3]. The desire to develop this digital innovation has actually been enshrined since the planning of the Malaysian Education Development

Plan 2013-2025 (PPPM2013-2025). On the seventh shift, harnessing information technology is regarded as a basis for improving the quality of learning that has been targeted through a series of implementation processes. The implementation of digital innovation in the education field can expand more attractive education potential and create diversity. Digital innovation in the era of Industrial Revolution 4.0 is able to make education a hub of knowledgewithout borders and develop internet-based communication aspects as well as create interactive educational space [4]. The study also emphasized that digital innovation is needed to enhance the capabilities of educational resources such as sophisticated new learning materials, virtual learning and the provision of state-of-the-art learning support. At that time, this study also voiced concern if digital innovation is not implemented, how education could thrive in a borderless world (today).

In the education field in Malaysia, several policies have been formulated to drive the development of digital technology innovation in line with aspirations at the national level. For example, Ministry of Education (MOE) has implemented the ICT Transformation Plan 2019- 2023 focusing on the development of digital technology in education. In this plan, three mainstrategies have been implemented, among them is to optimize the use of technology initiativesin the education field. The optimization includes expanding the use of ICT through innovation in various ways, especially in the aspects of teaching and learning. The two initiatives that have been coordinated in the ICT Transformation Plan are to improve fundamental issues and create innovation. The first initiative is to improve fundamental issues by focusing on improving the infrastructure and information technology capabilities of all schools in Malaysia. Meanwhile, the second initiative is to create innovation by providing access and support in cultivating the creation, improvement and development of innovated technologies in the education system such as digital learning innovation [5].

The Teacher Education Institute of Malaysia (IPGM) is optimistic in developing the capabilities and potential of lecturers in the digital innovation field to optimize current pedagogical skills based on information technology. The capability and significance oftechnology in leading the education branch is a necessity nowadays. Digital innovation is one of the efforts to ensure that lecturers can explore the benefits of technology for use in teachingsessions. To enable and improve the quality of learning, digital innovation is one of the most relevant measures, ways or methods. Thus, this study was conducted to identify the aspirations of IPGM lecturers to improve their capabilities in the digital innovation field. Starting in 2021, MOE formulated a digital education policy aimed at producing a generation that is proficient and competitive in the digital field [6].

II. METHODOLOGY

A survey study was conducted using qualitative methods via subjective items of open-ended questions. The questionnaire instrument was validated by an expert judgment group (5 experts)using content validity. Data were collected online using Google Form application. All IPGM lecturers were involved as respondents in this study and were required to answer the questionnaire. The findings of this study were then analyzed using NVivo Version 12.0 software. Subsequently, data screening, coding construction and theme production were conducted to answer the research questions. The thematic findings in this study were verifiedusing Kohen Kappa, and the validity point value of the findings was at a good level of 0.78.

III. FINDINGS

To what extent the aspirations of ipg lecturers could improve their capabilities in the digital Innovation Field. In this study, some aspirations of IPG lecturers in enhancing capabilities in the digital innovation field were identified. Based on the findings, lecturers aspired that they could

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create innovation, especially in the digital innovation field. Moreover, the lecturers also aspired that the implementation of training on digital innovation would be held in various forms to help improve their capabilities in the creation of innovation. Support through the aspect of infrastructure, funding assistance for innovation, and innovation commercialization assistance were the aspirations of the lecturers to enhance capabilities in the digital innovation field. Figure 1 presents the thematic and subtheme findings in this study.

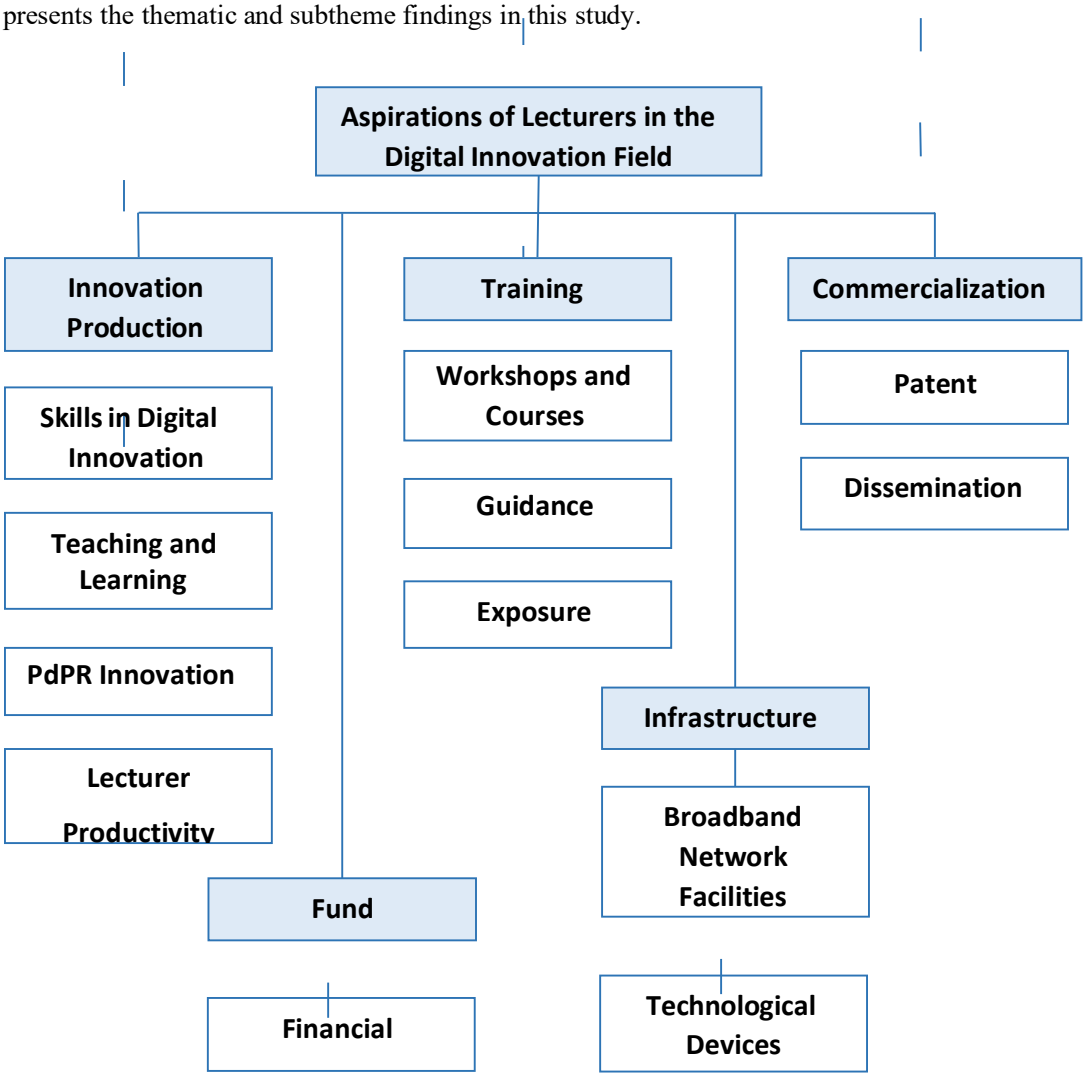

FIGURE 1: Aspirations of IPG Lecturers in the Digital Innovation Field

a. Innovation Creation

The capabilities of lecturers in creating innovation in the digital field are the aspiration to be implemented through skills development in digital innovation, innovation in teaching and learning (PdP), innovation during the teaching and learning at home (PdPR) process and increased lecturer productivity through digital innovation. With respect to European countries and their relation to the cultivating of digital innovation, a study by [7] explained that digitization in education is part of the policy in the education field at the tertiary level. The study characterized the quality of available digital infrastructure and resources (hardware and software), and identified key constraints to digital innovation on 547 study samples consisting of lecturers and students of Higher

Learning Institutions. The findings of the study indicated that there were significant constraints on limited infrastructure and resources, in addition to lack of funding. Moreover, insufficient technology resources also hindered the ability to foster these digital innovations. In fact, a conservative academic culture and lack of technical support have hampered efforts to elevate the digital innovation area. The study clearly showed that the issue of cultivating digitalinnovation not only existed in developed countries but also in modern and developing countries. Typical issues such as infrastructure and funds are often raised and become aspirations among the implementers of digital innovation (educators).

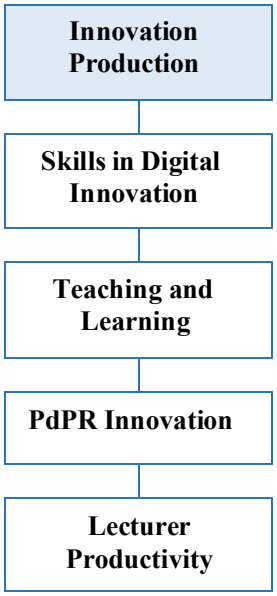

FIGURE 2: Lecturers' Aspirations to Create Innovation

In the sub-theme of skills in the digital innovation field, the aspiration of lecturer is to increasethe capability in creating digital innovation products in line with the world development that makes full use of digital technology in the learning process.

> *Hopefully many opportunities are given to improve skills in digital innovation that is constantly changing and growing rapidly.* (OES116)

The lecturers also aspired to have broader skills in creating a digital innovation for use in theeducation field in particular.

> *I hope that one day, I will be highly skilled in the digital field and be able to create an innovation that is really beneficial for the education field.* (OES1137)

With the skills possessed, the lecturer aspired that a meaningful impact could be given to thestudents in learning.

> *Be more efficient and proficient in a variety of digital skills to further enhance current teaching and learning practices and produce meaningful learning for students.* (OES860)

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The majority of lecturers also aspired to create digital innovation products focusing on the teaching and learning process (PdP). Various PdP innovations need to be created to help students understand the content of the subject. The second initiative is to enrich the digital content of quality educational materials as well as to strengthen teachers' competencies. The last initiative is to cultivate the use of digital technology among education leaders in schools [8]. To intensify and enable thepolicy to be implemented, the Continuing Professional Development Plan (PPB) and the Master Plan for the Development of Teacher Professionalism are used as part of efforts to drive this aspiration

> *It is aspired that more meaningful and effective innovations in music education couldbe created.* (OES461)

> *Digital innovation is relevant to the current learning situation. It is aspired to be ableto disseminate the relevant modules.* (OES1563)

> *Increase interest and facilitate the learning and teaching of Arabic language at all levels.* (OES1535)

As the country is still plagued with Covid-19 pandemic, the online teaching process or more precisely the term Teaching and Learning at Home (PdPR) has been implemented. A study by Ferrari, Mura, & Diamantini (2018) on 420 teachers in one of the districts in Milan, Italy showed that teachers were unprejudiced and positive to implement digital innovation in education. Teachers showed a strong commitment to implement innovation with the awareness that innovation could have a positive impact on students and teachers [9]. The lecturers aspired that some digital innovations could be created to help the PdPR process whichis fully digitally driven.

> *Master all the skills and knowledge of digital innovation to facilitate the delivery ofPdPR online, and also assists various levels with digital innovation skills and knowledge.* (OPS10)

> *Hopefully digital innovation could help PdPR to be more effective in this VUCA era.*
>
> (OES464)

> *I hope all lecturers could deepen the latest digital knowledge to help improve theircapability in the delivery of PdPR.* (OES1017)

Lecturers also aspired that through this digital innovation, lecturer productivity could be improved, especially in the field of knowledge and expertise.

> *Digital innovation is the best way to improve digital science in accordance with thePDP of this millennium.* (OES281)

> *Digital innovation is able to bring education and knowledge to every layer of society.*
>
> (OES837)

> *There will be opportunities to learn and explore the digital field over time. This fieldwill be very important in the future.* (OES754)

My aspiration in the digital innovation field is that all educators, namely lecturersand teachers, should constantly improve their knowledge and achieve an excellentlevel of mastery. (OES851)

b. Training

In the digital innovation field, lecturers also aspired that training in this field could be implemented in the form of workshops and courses, guidance and also exposure asdescribed in Figure 3.

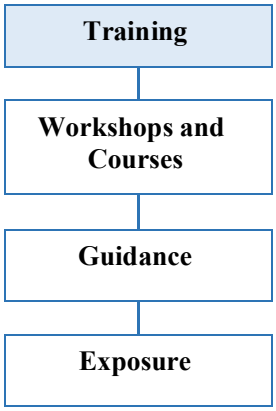

FIGURE 3: Lecturers' Aspirations towards Training

All trainings provide various benefits in the development of digital innovation to the group of lecturers at IPGM. More workshops and courses should be held to enable lecturers to be specifically exposed to the digital innovation field. The findings of the study also explored what were the aspirations among teachers towards the cultivating of digital innovation [10]. This is because not all lecturers have specific expertise in the digitization of education which can simultaneously innovate researchoutcomes.

There must be input/training before an innovation is created. Digital knowledge is very important because not everyone has a foundation in this field. (OES178)

I hope to attend more courses on digital innovation to further enhance my digital innovation skills as it requires specific workshop exposure. (OES322)

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Hands-on courses need to be expanded for digital innovation creation. The basic knowledge of digital applications definitely needs to be solidified beforehand. (OES798)

With the workshops and courses provided, the lecturers' aspiration was to be able to develop digital innovation, especially in digitizing PdP.

My knowledge and skills in this field will increase by participating in various workshops so that it could be shared with students. (OES144)

All educators can be exposed to the construction of digital innovations especially those related to PdP through workshops and courses widely so that all educators can apply it in their respective PdP. (OES1010)

In addition, the guidance aspect in the training needs was also highly aspired to assist lecturersinitiate and subsequently implement digital innovation. According to the lecturers, input on digital innovation was very much needed; thus, focused guidance should be given.

Appropriate training related to this field should be provided. There is no input on digital innovation. (OES978)

I expect more training and skills to be given to lecturers from internal or external institutions for application in PdP. (OE1169)

The results I have produced and used during the PdP session can be shared with more people. I am less given the opportunity to do so and also rarely given the space to shareideas with other friends even though I strive to do so. Therefore, I have taken the initiative to do it because only certain individuals are given the opportunity and spaceto share their ideas en masse in my IPG. (OES251)

The production and sharing of digital innovations needs to be expanded so that theycould be used by all educators in imparting knowledge to students. (OES509)

Digital innovation needs to be harnessed and disseminated through partnerships fromdigital innovation enablers. (OES958).

c. Funding

To produce an innovation, the lecturers' aspiration was that the support of funds in the form ofmoney can be channelled to develop a new digital innovation.

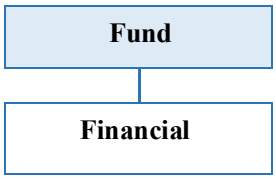

FIGURE 5: Lecturers' Aspirations towards Fund Allocation

Fund is the basis for sustainable product development and the quality of an innovation productcould be developed.

> *IPGM should apply for special funds from MOE to develop innovations in IPGespecially digital innovation. Funds are not common but very important like universities in Malaysia which are given grants worth hundreds of thousands and millions. This will help market the innovation product and be proud of it. Lack of fundswill narrow the scope of expansion. IPGM should have great aspirations in line with the allocation of funds. Otherwise, large-scale achievements will not be possible and are only average.* (OES32)

> *Training facilities and financial allocations need to be provided to venture intoinnovation.* (OES337)

> *There needs to be support and encouragement from superiors in providing funds to engage in the production of more competitive digital innovation products.* (OES1230)

d. Infrastructure

Infrastructure was also part of the lecturers' aspirations in the digital innovation field. The following diagram describes the two aspects of infrastructure that were aspired by lecturers, namely broadband network facilities and technological devices, that are the basis of capabilities in the development of a digital innovation.

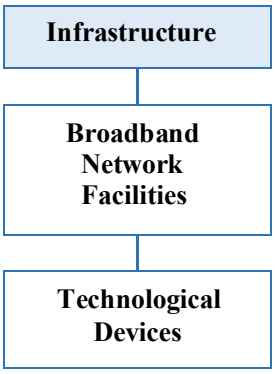

FIGURE 6: Lecturer's Aspirations towards Infrastructure in Digital Innovation

As digital innovation requires network access and the use of technology-based aids, the lecturers' aspiration was that improvements could be made to broadband network facilities around the campus in particular and the technological devices that are the backbone in implementing a digital innovation process. Complaints from lecturers about accessibility are the key factor in their aspirations of infrastructure.

> *Internet speeds that are comparable to those abroad need to be available in the countryso that the digital innovation field can be empowered as a whole.* (OES98)

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Good internet access and sufficient resources can increase the use of digital technology and hence digital innovation. (OES279)

The development of digital innovation skills needs to be in line with the internet access facilities at IPGs. Otherwise, it is difficult to implement completely and perfectly. (OES488)

The internet infrastructure on campus needs to be improved to facilitate the process of digitizing all aspects by lecturers and students. (OES609)

In addition to internet access, another lecturers' aspiration was that the infrastructure in the form of technological devices could be improved. For example, the enabling of new software and hardware to develop a digital innovation on campus.

I hope the government provides the latest technological tools for PdPC to all lecturers and students. (OES241)

My aspiration is that IPGM could provide the latest digital equipment and facilities to every campus. (OES871)

Digital innovation must be in line with the infrastructure provided by IPGM/IPGK.

(OES11030)

Lecturers should be provided with appropriate software to create digital innovations. Without good tools or software, digital innovation is not possible. Computer programming training should also be given to lecturers. (OES1596)

To intensify and enable the policy to be implemented, the Continuing Professional Development Plan (PPB) and the Master Plan for the Development of Teacher Professionalism are used as part of efforts to drive this aspiratio. In line with this policy, teacher trainees at IPG are also required to attend Technology courses for PdP to prepare teachers to face the digital technology in education [9]. The study also emphasized that digital innovation is needed to enhance the capabilities of educational resources such as sophisticated new learning materials, virtual learning and the provision of state-of-the-art learning support [10]. At that time, this study also voiced concern if digital innovation is not implemented, how education could thrive in a borderless world (today).

IV. DISCUSSION AND CONCLUSION

Based on the findings obtained, the lecturers exhibited seriousness in their efforts to implement digital innovation in the education field. The lecturers' aspirations to create innovation were heart-warming. They showed commitments to improve their skills in digital innovation as well as create innovations focusing on teaching and learning. They also clearly demonstrated their commitments in cultivating the practice of digital innovation in the scope of career. Lecturers are also able to adapt the current situation when aspiring to explore and implement some digital innovations specific to PdPR to expand and enable teaching needs. This explains the readiness of lecturers to face the new teaching norms situation by incorporating digital innovation as a tool to enable teaching methods.

IPG lecturers also aspired to place digital innovation as a space to increase productivity in the

education profession. They were aware that with the empowerment of digital innovation, space to enhance digital knowledge in enabling meaningful teaching to students is highly expected nowadays. Application of funds was aspired by most IPG lecturers as financial fundsare a necessity to expand the outcomes of digital innovation to a higher level. The creation of an innovation requires equipment, expertise and consulting costs.

Infrastructure in terms of broadband network facilities and devices was an aspiration of IPG lecturers. They perceived that weaknesses in this aspect of infrastructure have hampered the aspirations in implementing digital innovation. Similar to financial funds, aspirations for infrastructure related to broadband network capacity and technology-based devices could mobilize broader exploration in creating digital innovations which are partly internet-based thinking. In addition, the aspirations of the lecturers were also towards the needsto undergo courses, workshops, and training, and receive guidance. Therefore, the re- empowerment of the Information Technology Department in each campus is highly necessary. This department could act as the backbone and drive efforts in the dissemination of training and guidance on campus for the digital innovation field. Furthermore, commercialization aspect is very important in digital innovation as it helps the process of implementing the innovation outcomes.

In this study, IPG lecturers also aspired that the commercialization aspect could be assisted and expanded through the process of patenting and disseminating innovation outcomes. Most lecturers were aware that beneficial innovations should be properly copyrighted (patented) for plagiarism protection which will ultimately erode the originality and exclusive rights of the work. Moreover, partnerships in the digital innovation field shouldalso be expanded through seminars, conferences and presentation sessions. At the very least, it could create research links with more parties in digital innovation to share the impact and implications of innovation to many parties.

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