INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES
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ISSN: 2222-6990

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**To Link this Article:** http://dx.doi.org/10.6007/IJARBSS/v11-i8/10686 DOI:10.6007/IJARBSS/v11-i8/10686

***Received:*** *23* June *2021,* ***Revised:*** *27* July *2021,* ***Accepted:*** *18* August *2021*

**Published Online:** 30 August 2021

**In-Text Citation:** (Radhakrishnan & Mahmud, 2021)

**To Cite this Article:** Radhakrishnan, D., & Mahmud, S. N. D. (2021). Perspectives of Science Programme Students of National University of Malaysia(UKM) Towards Online Learning at the Times of Covid-19. *International Journal of Academic Research in Business and Social Sciences*, *11*(8), 1514–1525.

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**Vol. 11, No. 8, 2021, Pg. 1514 - 1525**

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# Perspectives of Science Programme Students of National University of Malaysia(UKM) Towards Online Learning at the Times of Covid-19

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**Abstract**
Immediate closure of institutions due to the pandemic of Covid-19 made the shift of teaching and face-to-face teaching and learning process into distance . This have caused various factors to contribute to less participation of students in teaching and learning process. The purpose of this study was to find the perspectives of science programme students in online learning to ensure the smooth process of teaching and learning in the times of Covid-19. Questionnaire instrument was used in this study and data obtained from 50 students were analyzed using descriptive statistics.The results of the analysis show that Science Programme students' perspectives in online learning is at satisfactory level when compared to face-to-face learning. However, the readiness of students to participate in online learning is high. This is able to increase the interest for online learning among students to ensure the teaching and learning process occurs at a good state. The implication of this study provide clues in how online components and strategies might be implemented to improve teaching and learning in the 21st century.
**Keywords:** Science Student Perspectives, Online Learning, Covid-19

## Introduction

The world is currently dealing with Coronavirus Disease 19 (Covid-19) which is declared a global epidemic by the WHO. This undeniable Covid-19 pandemic situation has caused serious repercussions on communities around the world (Tamin & Mohamad, 2020). According to UNESCO, the epidemic has disrupted the learning of more than one billion students in 129 countries around the world causing learning institutions to temporarily suspend their academic calendars (Sundarasen et al., 2020). The announcement by the Prime Minister of Malaysia for an order to stay at home due to the Covid-19 pandemic has formed a new norm in Malaysia where teaching and learning practices shift to e-learning so that not a single person is left behind in education (Tamin & Mohamad, 2020).

Distance learning involving various online platforms such as Zoom, WebEx, Microsoft Teams, Google Meet and Google Classroom. Online teaching methods involve two types namely synchronous teaching and asynchronous teaching. Synchronous teaching means the lecturer teaches and communicates with students in real time online using various video

conferencing applications while asynchronous teaching is the lecturer recording his teaching and assigning assignments to students to complete in a specified time and this does not happen in real time (Rashid et al., 2020).

According to Pallot and Pratt (2005), many of the students' inherent perspectives on online learning need to be well understood to increase their satisfaction. Data collected from students admitted to having less than 100% participation for a set online learning session or activity. Analysis of student feedback showed four main factors of difficulty with online learning faced by students. Technical problems and self -attitudes contribute as the biggest factors of students' absence from online learning (Kamal et al., 2020).

The research community (COL) framework is an idea that has been proposed by Garrison, Anderson and Archer (2001), to foster an effective learning community. The framework consists of three structural elements including social, cognitive and instructional presence (Garrison, Anderson & Archer, 2001). These three elements of attendance are important in online learning for students.

**Problem Statement**

Closure of institutions immediately because of this pandemic caused the teaching and learning system (PdP) to switch to online resulting in PdP not being fully effective. This is associated with poor internet network factors and the inability to have sophisticated electronic gadgets for all students (Kirin et al., 2021). Online learning comes as a surprise for students (Salleh et al., 2021).

A study by Shiung (2007), stated that an inappropriate learning environment will be an infrastructure barrier for students in the e-learning process. However, there are a number of students who agree that they are comfortable with the implementation of online learning because it encourages them to be more innovative using computer technology (Bali, 2018). Social interaction between students and lecturers is important so that teaching and learning take place actively (Hurst, 2013). The level of communication excellence of students and lecturers by using communication media helps social relationships in this online learning process. This is because each student has a different perception of online learning media.

According to a study by Kamal et al., (2020) students have agreed that their participation in online learning is not 100%. In accordance to this, various factors have contributed to student participation being less in online learning for instance technical issues, self-attitude, learning management and environment. Since this problematic issue exists, the objective of the study is to find out the perspectives of science programme students in online learning to ensure the smooth process of teaching and learning in the times of Covid-19.

**Literature Review**

***Online Learning Platform***

Online learning can be said as e-learning (Rubiah & Jamilah, 2009). E-learning is known as m-learning or mobile learning where an individual learns through the internet by means of information management facilities that is through two ways; synchronization and asynchronization (Zahiah & Abdul Razaq, 2010). Generally, online learning involves the use of technology to channel notes and assignments required by students to be sent by academics via electronic mail (e-mail) and websites (Rubiah & Jamilah, 2009). According to Alley (2001), the use of the Internet to access learning materials that involve communication with content, instructors and colleagues emphasizes the importance of the Internet and interaction in distance learning.

The characteristics of e-Learning are changing in line with the progress and development of educational technology, namely LMS (Learning Management System) which is used as a platform to deliver learning materials online (Najib, Bakar & Othman, 2017). The use of technology plays a role as a delivery system for online learning in distance teaching and learning systems (Yusup, 2012). In addition, online learning can provide a wide learning impact or opportunity for students for active, interactive, collaborative student involvement as well as promote lifelong learning. The learning experience can be obtained through the use of e-learning if managed in an appropriate learning environment as the values highlighted are "Exploration, Experience Engagement, Empowerment, Effectiveness, Expanded and Ease of Use" (Rafiza, 2013).

Technology is a tool that supports the online learning process. This process involves the selection and use of the most appropriate information and communication technology tools and materials to facilitate the online learning process (Yusup, 2012). According to researchers of the past, online teaching connects educators and students through electronic systems such as internet, satellite, TV, CD-ROM and Radio for long-distance interaction between them (Yusuf & Jihan, 2020).

Currently, the teaching and learning process implemented at the time of Covid-19 takes place online through various side platforms that have been developed in line with the development of technology, namely Zoom, Google Classroom, WhatsApp, Google Meet, Webex, Microsoft Teams, GoogleDrive, Screen Share recording and Telegram (Yusuf & Jihan, 2020). Additionally, the latest media formats such as MP3 and MP4 files have enabled tutorial materials to be downloaded in the form of video, audio, imagery and digital slides. This learning method is designed with self-instructional, interactive, student-friendly (learner friendly) and systematically (Zahiah & Abdul Razaq, 2010).

***Connectivism Learning Theory and e-Learning***

Connectivism theory was introduced by Siemens (2005) which shows the changes and effects in learning brought about by the wave of new technologies in the network age. According to Muhammad (2009), Connectivism is defined as a learning theory that integrates principles explored through theories of chaos, network, complexity, and self-organization and processes that occur in an environment where the core elements of learning are vague and not fully underway individual control. This theory of Connectivism strongly influences the theory of distance learning which involves online is very concerned with independent learning as well as communication between students, students-information materials and students-teachers. The features involved in this theory are flexible learning and self-autonomy that still provide opportunities to network learning with other peers (Hamdiah, 2017). Siemens (2006b), explains that this Connectivism theory is essential for new learning to respond to the development and complexity of information resources in an ever increasing network and new communication tools that can meet the capabilities of web-based learning.

***Students' Perspectives on Online Learning***

The immediate exchange of learning from face to face to distance learning has changed students' perspectives on this online learning. Students' perspectives on online learning can be seen in terms of students' readiness for online learning. Online learning readiness is a concept first defined by Warner, Christie, and Choy (1998) in Australia's technical vocational education and training (TVET) sector. There are various dimensions of this online learning that can be seen in the readiness to learn online. Among them are self-efficacy with computers

and the internet, student control learning, self-efficacy with online communication, motivation for learning, and self-learning (Chung, Noor & Mathew, 2020).

Self-efficacy with computers and the internet is the concept related to students' technology related knowledge, skills, attitudes, and competencies in using technology to meet educational goals and expectations in higher education (Hong et al., 2019). According to a study by Ahmed, Allaf & Elghazaly (2020) students more agree that the effectiveness of the internet is a barrier factor in online learning. Internet connectivity has become one of the main problems in Malaysia for online learning where students and teachers still experience unstable internet problems (Rashid et al., 2020).

Student control learning is an online learning that requires students to direct their own learning without being face to face with the lecturer. In this regard, student control includes directing self-directed learning progress that is able to sustain learning without being interrupted by other online activities (Chung, Noor & Mathew, 2020). Additionally, self-efficacy in an online context is influenced by previous success with online learning systems, anxiety in the use of online learning technology, instructor feedback, and pre-course training (Taipjutorus, Hansen & Brown, 2012).

Self-efficacy with online communication is very important for online communication because there is no face-to-face interaction between lecturers and students and the only way for students to communicate with lecturers and other classmates is through online communication (Chung, Noor & Mathew, 2020). According to McVay (2000), self-efficacy for communicating by online is important so that students can internalize what they have learned by posting questions, expressing their emotions and thoughts.

Motivation for learning is something that can be affect what we learn, how we learn as well as when we choose to learn (Chung, Noor & Mathew, 2020). Ellen, Geetha & Laura (2020) stated that motivation to learn can be divided into intrinsic and extrinsic motivation. Intrinsic motivation refers to a person's mental, social and physical development that influences a person's interest directed to certain choices in life. Extrinsic motivation refers to the tendency to achieve goals based on external rewards.

Self-learning is a learning strategy that allows students to master the learning process by diagnosing learning needs, learning objectives, learning strategies and evaluating their performance and learning outcomes (Chung, Noor & Mathew, 2020). Personal attributes are important for this self-learning. These personal attributes include the motivation and ability of students to take responsibility for their learning (Song & Hill, 2007).

***Research Community Framework In Online Learning (CoI)***

The Community of Inquiry (COI) Framework is a framework introduced by Garrison, Anderson and Archer to create an effective learning community (Hatmanto & Pratolo, 2020). This framework is said to be a model for the online learning process (Swan, Garrison & Richardson, 2009). They argue that higher learning experiences should be conducted as a research community composed of teachers and students who need demonstrations of critical thinking and the involvement of "real" people in order to succeed (Arbaugh, 2007). The learning process is implemented through the interaction of the three components found in this framework, namely social, cognitive and teaching presence (Hatmanto & Pratolo, 2020).

Social presence is the ability of participants to forge personal relationships, identify with communities, and communicate with purpose using their respective personalities (Garrison, Anderson & Archer, 2001). Research on social presence states online learning focuses on its role in facilitating cognitive development and critical thinking (Arbaugh, 2007).

One of the strategies for fostering a social presence in an online learning environment is to have online discussions conducted either simultaneously or not simultaneously. However, non-simultaneous discussions offer more added value by giving students experience of using computers as communication tools and opportunities to participate in group work (Hatmanto & Pratolo, 2020).

Cognitive presence is said to be the extent to which participants in a particular research community configuration are able to construct meaning through continuous communication. This cognitive presence can be operationalized through four stages including event triggering, exploration, integration and resolution (Garrison, Anderson & Archer, 2001). According to Arbaugh (2007), when compared to the three types of attendance in the Research Community Framework, cognitive presence is likely to be the most challenging to develop in online learning.

Teaching presence serves to organize and mediate all elements of CoI in a functional and balanced relationship appropriate to students' needs and desired learning abilities and outcomes (Garrison, Anderson & Archer, 2001). Although teaching presence is conceptualized as just as important as social presence and cognitive presence in the CoI framework, it has generally not received research attention to the use of the internet as a mainstream teaching medium (Arbaugh, 2007).

## Methodology

This study uses a quantitative study design. The population in this study involved science programme students of undergraduate from National University of Malaysia (UKM). The sample of the study involves 50 students from the Science and Technology Faculty who answered the questionnaire form given.

The instrument in this study was a questionnaire form through online. The questionnaire was divided into three parts; Part A- information namely on name, gender, nationality, level of graduate studies and place of online learning, Part B (5 items)-information namely on characteristics of students undergoing online learning and Part C (16 items)-measures perspectives of Science programme students in online learning in the times of Covid-19. To measure the perspectives, a five point Likert Scale i.e. a scale of 1 to 5 was used.

The questionnaires received were analyzed descriptively to answer the objectives of the study. Descriptive statistics were used in the study to identify the perspectives of Science programme students in online learning in the times of Covid-19. The interpretation of the mean score is shown in Table 1.

**Table 1: Interpretation of Mean Scores**

| Min Score | Interpretation of Min |
|---|---|
| 1.00-2.00 | Low |
| 2.01-3.00 | Medium Low |
| 3.01-4.00 | Medium high |
| 4.01-5.00 | High |

**Source: Sirkin (2005)**

Before a field study is conducted, the questionnaire used must first be ensured to have validity and reliability. The validity of the questionnaire was obtained through the Kaiser-Meyer-Olkin (KMO) test and the reliability was tested with the Cronbach's alpha test (α). The value of validity and reliability obtained through the pilot study is 0.87 and 0.89 means that the value

obtained is good and can be used for the study based on Table 2 and Table 3.

**Table 2: Kaiser-Meyer-Olkin (KMO) values**

| Kaiser-Meyer-Olkin Value (KMO) | Item Receipt Level |
|---|---|
| > 0.90 | Very good |
| 0.81-0.90 | Very good |
| 0.71-0.80 | Good |
| 0.50-0.70 | Simple Good |

**Source: Kaiser- Meyer-Olkin (1970)**

**Table 3: Cronbach's Alpha values**

| Cronbach's Alpha value (a) | Item Receipt Level |
|---|---|
| 0.8-1.0 | Very good |
| 0.7-0.8 | Good |
| 0.6-0.7 | Accepted |
| <0.6 | Doubted |
| <0.5 | Low |

**Source: Bond & Fox (2015)**

## Findings and Discussion

### *Perspectives of Science programme students in online learning*

**Table 4 : Perspectives of Science programme students in online learning in times of Covid-19**

| Code | | Item | SD | D | NS | A | SA | |
|---|---|---|---|---|---|---|---|---|
| | | | F<br>% | F<br>% | F<br>% | F<br>% | F<br>% | Mean |
| **KS** | | **Readiness** | | | | | | |
| **KS1** | | Guidelines are provided (e.g.; How to use relevant online tools) before starting an online lecture by my lecturer. | **2**<br>4.0 | **6**<br>12.0 | **14**<br>28.0 | **20**<br>40.0 | **8**<br>16 | 3.52 |
| **KS2** | | Online tools are easy to use. | **0**<br>0 | **1**<br>2.1 | **10**<br>20.8 | **27**<br>56.3 | **10**<br>20.8 | 3.92 |
| **KS3** | | Flexibility to participate in lectures online. | **1**<br>2.0 | **2**<br>4.0 | **5**<br>10.0 | **30**<br>60.0 | **12**<br>24.0 | 4.00 |
| **KL** | | **Advantages Felt** | | | | | | |
| **KL1** | | Easy to access teaching methods and online lecture materials. | **0**<br>0 | **6**<br>12.0 | **18**<br>36.0 | **16**<br>32.0 | **10**<br>20.0 | 3.60 |
| **KL2** | | Online lectures are more effective than traditional/direct class lectures. | **9**<br>18.0 | **16**<br>32.0 | **14**<br>28.0 | **9**<br>18.0 | **2**<br>4.0 | 2.58 |
| **KL3** | | Using online learning is fun. | **7**<br>14.0 | **7**<br>14.0 | **23**<br>46.0 | **7**<br>14.0 | **6**<br>12.0 | 2.96 |
| **KL4** | | Gain learning experience in a new online environment. | **1**<br>2.0 | **4**<br>8.0 | **12**<br>24.0 | **23**<br>46.0 | **10**<br>20.0 | 3.74 |
| **KL5** | | High motivation to participate in online lectures | **5**<br>10.0 | **15**<br>30.0 | **17**<br>34.0 | **9**<br>18.0 | **4**<br>8.0 | 2.84 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **KL6** | | Happy with student-lecturer interaction during online teaching & learning | **5** 10.0 | **10** 20.0 | **19** 38.0 | **12** 24.0 | **4** 8.0 | 3.00 |
| **KL7** | | Have the facilities to ask questions or eliminate doubts during online lectures | **2** 4.0 | **6** 12.0 | **18** 36.0 | **17** 34.0 | **7** 14.0 | 3.42 |
| **KL8** | | An ideal environment for attending lectures online | **5** 10.0 | **5** 10.0 | **18** 36.0 | **18** 36.0 | **4** 8.0 | 3.22 |
| **KK** | | **Disadvantages Felt** | | | | | | |
| **KK1** | | Frustration and lack of interest in learning during Movement Control Order. | **0** 0 | **6** 12.0 | **13** 26.0 | **24** 48.0 | **7** 14.0 | 3.64 |
| **KK2** | | Lack of direct contact with other students/friends/other friends | **1** 2.0 | **4** 8.0 | **8** 16.0 | **19** 38.0 | **18** 36.0 | 3.98 |
| **KK3** | | Inconsistent/bad relationship and communication with lecturers. | **4** 8.0 | **9** 18.0 | **15** 30.0 | **19** 38.0 | **3** 6.0 | 3.16 |
| **KK4** | | Personal attention from lecturers is less. | **1** 2.0 | **7** 14.3 | **22** 44.9 | **15** 30.6 | **4** 8.2 | 3.28 |
| **KK5** | | Possible interference from other family members during online lectures. | **1** 2.0 | **3** 6.0 | **7** 14.0 | **25** 50.0 | **14** 28.0 | 3.96 |

*SD = Strongly Disagree, D= Disagree, NS= Not Sure, A = Agree, SA = Strongly Agree

Table 4 shows the perspectives of Science programme students in online learning in the times of Covid-19 in terms of readiness, advantages and disadvantages felt. The data showed that the overall students' perspectives on the readiness to learn through online is high. This is evidenced by the high value of mean score especially at the Item KS3 (4.00) whereby most students (60%) agree that they are flexible to participate in the online lectures. This finding is line with the study by Sahin & Shelley (2008) that there is positive beliefs about the flexibility of distance education among students which provide students with great flexibility in interacting with their instructor, classmates, and the course content. Besides, finding by Bertiz & Karoglu (2020) also stated that cognitive flexibility scores of the students examined for distance education is above the middle and close to high. Study from Smart & Cappel (2006) mentioned that seven users recorded the flexibility and convenience of online learning, such as the ability to access the lessons anywhere at anytime and to complete the units at one's own pace. According to Ardito et al. (2006), students' online readiness is one of the keys for the success of any distance education.

The overall students' perspectives on the advantages felt to learn through online showed an equal of moderately high and moderately low level. The moderately high mainly evidenced by the Item KL4 which recorded the mean score as 3.74. 46% of the students agree that they are gaining learning experience in a new online environment. This data is in line with the study by Smart & Cappel (2006) which recorded that students have the opportunity to gain online learning experience. For instance, one of the participant commented that the use of the online units offered "another learning perspective," and another said, "It gives another way to learn instead of reading from a book." According to Driscoll & Carliner (2005) online instruction is able to actively engage learners to analyze, synthesize, and evaluate information while constructing knowledge.

The moderately low could be seen especially at Item KL2 with mean score of 2.58 whereby 32% of the students disagree that online lectures are more effective than traditional/direct class lectures. Students are still more preferring the direct class lectures compared to online

lectures due to the effectiveness of learning is felt better in direct lectures. Besides, item KL6 which records the mean score of 3.00 showed that 38% of the students are not sure whether they are happy with student-lecturer interaction during online teaching and learning. These two items' data are in line with the study by Anggrawan & Jihadil (2018) which states that face to face learning establishes a meaningful and real interaction among students and lecturers, where it actually could not be substituted by online e-learning.

The overall students' perspectives on the disadvantages felt to learn through online is relatively moderately high. This is evidenced by item KK1 and KK2 with the mean score of 3.64 and 3.98 respectively. 48% of the students agree that they are frustrated and lack of interest in learning during Movement Control Order. This is according to the study by Hara (2000) which stated that potential problems of e-learning are learner frustration, anxiety and confusion. This can be due to the less active communication between lecturers and students. This is supported by the study by Adnan & Anwar (2020) whereby 71.4% of students reported that learning in the conventional classroom was more motivating since there will be face-to-face communication which lead to active interest in learning. Meanwhile, 36% of the students strongly agree that there is lack of direct contact with other students, friends and other friends. Students are preferring the direct contact while learning which they find it more efficient but somehow during this pandemic it's impossible. However, strategies can be implemented to enhance the communication and contact among lecturers and students to make the teaching and learning process more efficient.

## Conclusions and Implications

The study found that Science Programme students' perspectives in online learning in the times of Covid-19 is at satisfactory level when compared to face-to-face learning. However, the readiness of students to participate in online learning is high. This is able to increase the interest for online learning among students to ensure the teaching and learning process occurs at a good state. Additionally, guidelines related to relevant online tools to be used should be provided before the start of online lectures as well to ensure the good perspectives of students on online learning. The results from this study provide insights in how online components and strategies can be implemented to improve teaching and learning in the 21st century, specifically as we work to engage students actively in learning to provide real-world contexts for learning and to promote critical thinking and deep learning. Besides, through implementing the preference learning method by students could help to increase students' motivation to involve actively in online learning. This could eventually prevent from the drop of the students' achievement in studies.

## Acknowledgement

Acknowledgement to grant number GGPM-2019-010.

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