Online Distance Learning: A New Learning Approach in the Malaysian Gifted Education System

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While online distance learning has become more prevalent in Malaysia's higher education system, it is still uncommon in the country's secondary schools, particularly for gifted programmes. Following the spread of the COVID-19 pandemic, Malaysia's educational environment was transformed, resulting in the emergence of new prospects for successful distance learning. The purpose of this quantitative research was to determine whether online distance education benefits Malaysian gifted and talented students or not. The study comprised 305 students between the ages of 11 and 17 from a Malaysian gifted school. This research used a five-point Likert scale with a reliability coefficient of 0.94, which was determined to be reliable. After completing a four-week online distance learning course, participants were invited to complete a questionnaire. There were four learning areas in which effectiveness was assessed: learning facilities, assignments, motivation, and computer skills. While gifted students demonstrated a high degree of computer skill, the statistics indicate that online distance learning is moderately successful. Urban students showed a greater potential for online distance learning than rural students. More studies should be conducted on how to enhance online distance learning for gifted students .

Keywords: distance education; online learning; gifted and talented; COVID-19; survey research

The term "online distance learning" refers to the process of learning through text or virtual communication. Teachers and lecturers may utilise this method to connect with students throughout the nation in order to ensure the process of teaching and learning. This would assist students who are unable to study during normal school hours due to

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some reasons or who live very far to attend a class during regular school hours. The Universiti Sains Malaysia (USM) started providing a foreign higher education programme for Malaysians on January 1, 1971. This was a historical event in the Malaysian distance education system (Raghavan & Kumar, 2008). People had a lot to say about distance learning in the 1980s, when it was being contested in academia. Keegan (1980) has contributed to the development of distance learning terminology highlighting four definitions of distance learning accepted by the public. The concept of distance learning has been thoroughly discussed in the previous research includes:

I.   Distance education that encompasses a wide range of educational programmes at all levels does not require students to be observed by a teacher all the time, nonetheless, it takes use of the organisation's planning, guiding, and instruction (Süğümlü, 2021).

II. Distance education's success is credited to its emphasis on actual implementation and basic structures, as well as its extensive use of digital media. The success of distance education is partly due to its capacity to deliver high-quality teaching resources that can be used to train a large number of students simultaneously from any location. As a teaching and learning strategy, it is unique (Bozkurt, 2019).

III. Distance education refers to teaching method whereby teaching is executed separately from learning behaviour, including side-by-side situations where communications between teachers and students are assisted with printed, electronic, mechanical, or other materials (Lee, 2020).

The concept of distance learning is also related to Holmberg et al., (2005) who defined distance education as a concept covering teaching and learning activities that are not conducted side-by-side in cognitive and/or psychomotor and affective domains for students and which provide organisational support. Such activities can be conducted anywhere and at any time, making it appealing to those with social and professional commitments.

The accessibility of a wide range of inventions with the potential to enhance teaching and learning quality in education has increased considerably over the past twenty years. Along with more established technologies such as printing, television, and radio, the following developing technologies offered chances to improve the quality of education: mp3s and video recordings, software training programmes, and digital (disc and TV). More recently, the growth of interactivity and connections through electronic networking networks, popularly known as the "Internet", has provided educational services to augment these technologies. Such innovations have been adopted by distance educators in large numbers, although their use in traditional on-campus education has been selective and extremely limited. Distance education, e-learning, and online learning also have similar expectations and views of the learning approach. Grant (2019) asserted that the application of new technologies to support online learning in the form of distance education can be extremely effective when meticulous consideration is given to students' attributes and the learning context. Therefore, online education learning has immense potential in this era of modern education (Bernard & Rubalcava, 2000).

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Problem Statement

In 2020, the world was shocked by the emergence and rapid spread of the Coronavirus pandemic (COVID-19). It was reported that COVID-19 has affected more than seven million people worldwide, costing more than four hundred thousand lives and affecting 216 countries (WHO, 2020). On 2 August 2021, the total case of COVID-19 had spiked up to 199 million cases. Malaysia has not been immune from the enormous impact of the disease. COVID-19, first discovered in December 2019 in Wuhan, China, was declared a pandemic by the WHO on 11 March 2020 (Mahase, 2020). In response, it proposed various prevention methods to prevent the further spread of COVID-19. In Malaysia, *Majlis Keselamatan Negara* (Malaysian National Security Council) implemented the Movement Control Order (MCO) starting from 18 March 2020. This resulted in the long-term closure of numerous sectors, including the education sector. Consequently, all kindergartens, schools, and universities were instructed to close. To ensure the continuance of education during the pandemic, innovative teaching and learning methods became highly crucial. However, online education pedagogy is not the same as educational pedagogy in the classroom and teachers require more time to master the requisite skills (Meyers, 2008). Moreover, school level education in Malaysia is focused on teaching and learning in traditional classrooms – which requires less application of information technology and online materials. According to Hamzah and Attan (2007), teachers' preparedness to use computer-based information technology in teaching and learning is only at an average level. Moreover, studies by Noh et al., (2013) found that the level of technological application during teaching activities is at a low level. Additionally, teachers' tendency to use technological innovation depends on their perceived computer self-efficacy. Nevertheless, Mohiddin and Khalid (2014) asserted that there has been an upgrade in teachers' knowledge of how to apply technology, although room for improvement remains.

From the perspective of students, Internet coverage has become the main constraint in the implementation of online teaching and learning, despite their motivation and willingness to commit to studying online (Zulkifli et al., 2020). Recent research during the MCO phase by Gong (2020) found that, other than the issue of Internet coverage for students in rural areas, most low-income parents have found it difficult to provide each of their children with digital devices. Consequently, the implementation of online teaching and learning has become a challenge for both teachers and students.

During this pandemic period, online distance education has also been utilised by gifted and talented students pursuing their studies at Pusat GENIUS@Pintar Negara, Universiti Kebangsaan Malaysia. Due to the unique system of gifted and talented learning that encourages self-education, accelerated learning, and a differentiated learning environment, online distance education has the potential to be widely implemented among these students. According to Risemberg and Zimmerman (1992), self-education by gifted and talented students is better than that taking place among average students. Duraku and Hoxha (2020) also agreed that online learning is more suitable to be applied on gifted and talented students than conventional learning.

In normal situations, gifted students attend face-to-face (physical) classes to learn a variety of subjects such as music, science, maths, language, and moral education (Ismail & Anuar, 2020). Since conventional learning is based on such an approach, it is important to conduct research examining online distance learning among gifted and talented students, given that the entire nation has been subjected to an MCO whereby face-to-face education is not allowed. Thus, a comprehensive design for gifted online education must be devised to include cognitive, affective, social, and aesthetic practices (Md Jais et al., 2018).

Research Objectives

The research objectives were as follows:

(i) To ascertain the extent to which online distance learning is useful for gifted and talented students.

(ii) To identify the effectiveness of online distance education with respect to learning facilities, assignments, motivation, and online class skills.

(iii) To compare the effectiveness of online distance education between students from urban and rural areas.
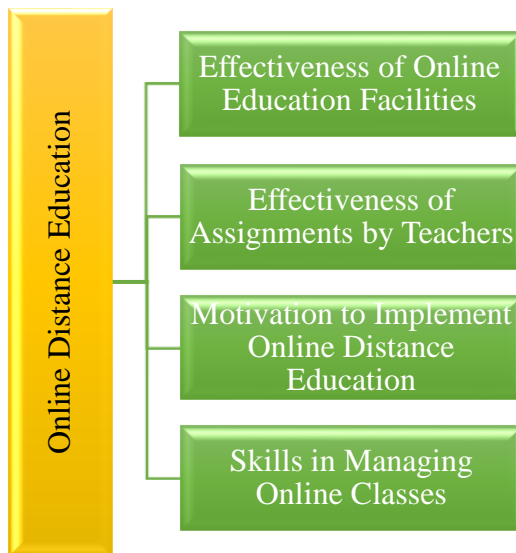
Conceptual Framework

Figure 1: Conceptual Framework for the Effectiveness of Online Distance Education

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Online Distance Learning

Distance education refers to the formal learning activities that occur while students and teachers are physically or temporally separated. Television, videotapes, computers, email, and letter writing are all utilised to facilitate this kind of instruction. In online education, the Internet/World Wide Web (often referred to as the Web) serves as the major medium of communication and presentation (Demuyakor, 2020). Distance education also comprises instructions released concurrently, asynchronously, or both. Simultaneous courses require students and instructors to "meet" online at the same time to exchange information through audio or web conferences, scenarios, online discussions, interactive whiteboards, application sharing, instant messages, and texts. Asynchronous interaction can take place using all these methods, as well as through discussion boards, blogs, wikis, among others. The distinguishing feature is that students are not required to meet directly with their instructor or peers. Moreover, learning materials can be distributed through the Internet and across time zones. Distance education classes are always "open" with materials available for students – anytime, anywhere – that can be accessed without restrictions (Milman, 2015).

According to Bernstein and Turban (2018), current workplaces require individuals to invent and collaborate in the face of time and space constraints. This requirement has since paved the way for technological advancement that makes real-time communication between peers and colleagues possible via the Internet. This has also been applied in distance education. Modern devices help to create a stronger learning community whereby members can build expertise and expand problem-solving skills. As educators who are distance teachers and instructors strive to improve the quality of online courses, they encounter challenges in fulfilling the various requirements of populations that are more flexible and technologically experienced than previous generations. At the same time, 21st century students need an educational opportunity that is not restricted to time and space yet allows interactions with instructors and peers. Voice and video conferences, whiteboards, live presentation tools, application sharing, discussions, and emails are among the numerous tools available for interaction and collaboration (Ismail et al., 2021). Blogs, wikis, and podcasts, as well as social devices are emerging forms of technology that encourage connectivity among members of a group.

Bates (1991) asserts that there are two highly diverse forms of interactivity in learning: social and personal. Social interaction between students and instructors must be balanced with the interaction between each student and teaching resources, including textbooks, guides, audiotapes, videos, and computer-assisted learning programmes. He argues that the view that students in traditional institutions are primarily engaged in substantive person-to-person contact is a fallacy as "the vast amount of their studies for both traditional and distance students is undertaken alone, by far, engaging with textbooks and other learning mediums." Distance educators also understand the need for social contact opportunities to help learners succeed and have thus tried to replicate face-to-face communication by designing educational systems based on the forms of technology such as electronic conferencing, electronic communication systems, video conferencing, and computers. Social interaction that can facilitate efficient learning has been used by residential schools and regional tutors. It is important to note that the required balance between social and individual interactivity can differ from one course to

another, depending on the type of subject, specific course goals, structure, quality, and the target student audience.

Mukhtar et al., (2020) identified advantages and limitations of online learning for students. Among the advantages are improved access, increased learning efficiency, and preparation of successful students for the community through lifelong learning opportunities and experience. However, online study environments, such as the fund for online learning programmes, organisation plans, and student training may be limited. The benefits of incorporating online education into conventional classroom pedagogy to enhance face-to-face education were identified by Stone and Perumean-Chaney (2011). Teachers and instructors are the first to know what is "essential" to enhance understanding and learning among students. Firstly, teachers should logically and reliably plan and cascade resources so that they are better prepared to look for and solve problems and teach in a typical lesson setting. In addition, the strategy for allocating and clarifying student activities related to learning difficulties can be diversified. Teachers and students should also use emerging technologies for the production and delivery of teaching. Distance teaching also enables teachers to retain the course programme while exhibiting better pedagogical versatility and maintaining their relationship with all students. Stone and Perumean-Chaney also found that in the absence of instructors, students had greater access to course materials. This increases learning because repeat classes, including activities and problem solving, are accessible to students.

Anna (2013) conducted studies comparing the effectiveness of teaching methods between classroom and online learning. They assessed the extent to which online students succeeded compared with their peers who attended the faculty. They found that focusing during an online class environment may be more challenging than in the traditional classroom. However, the participation of fewer students may assist in improving the quality and quantity of interaction in the online class.

In addition to the advantages and importance of online learning, some of its challenges must be scrutinised, such as those listed by Puzziferro and Shelton (2009):

   I.   What can we do to make online learning more student-centred?
  II.   What are new evaluative steps required to assess participation, interaction, self-learning, and student control?
 III.   Are new learning theories required to drive us into the next generation of online learning? Do we apply the definition of quality only to the matters that we can measure?
 IV.   Is there any difference between physical and online learning?

Muilenburg and Berge (2005) conducted a factor analysis study to examine the constraints on students undertaking online classes. This study was undertaken using a large sample (n = 1,056) to determine the basic constructs covering these constraints. The eight factors found were administration issues, social interactions, academic skills, technical skills, students' motivation, study time and support, Internet cost and access, and technical issues. The independent variables that had a significance influence on students' evaluation of these factors were gender, age, ethnicity, types of learning

institution, self-evaluation of online learning skills, the effectiveness of online learning, enjoyment of online learning, prejudiced behaviour towards the traditional classroom, and the number of online courses completed.

In western countries, distance learning for gifted students has started since a decade ago (Adams & Cross, 1999). Gifted students are defined as those who possess high IQ level but having unique traits such as asynchronous development and overexcitability (Ismail et al., 2021). It is found that there is a variety of distance learning programmes conducted by mail, the Internet, or a combination of the two. Several colleges and universities provide programmes in mathematics, sciences, and humanities for gifted students. Adults with a natural talent for mathematics may benefit from the enrichment and challenge opportunities provided by the programmes, as well as answers to the challenges connected with a shortage of competent teachers in public schools who can teach higher-level courses at the secondary level. Many colleges and organisations provide free or reduced-cost enrolment possibilities to gifted high school students interested in participating in their online learning programmes (Threlkeld, 1991). However, several nations, such as Malaysia, have yet to include online distance learning into their gifted education programmes. The Malaysian gifted school has created its first online distance learning programme in response to the COVID-19 outbreak, which began in 2020. According to Md Jais et al. (2020), Malaysia's educational system is shifting away from conventional modes of teaching to a more comprehensive style of instruction via the usage of online distance learning. This research is being conducted to determine the efficacy of a certain kind of online instructions for Malaysian gifted children in general.

Method

Research Design

This quantitative study employed a survey research design where respondents were exposed to a research intervention, and they then answered a questionnaire at the end of the intervention. According to Ponto (2015), survey research is conducted with a group of individuals to get information through questionnaires. Purposive sampling was applied to recruit potential respondents. The elements of learning effectiveness encompassed four domains: learning facilities, assignments, motivation, and online class skills.

Sample

This survey research was applied on gifted students recruited through simple random sampling method. The respondents were students from Pusat GENIUS@Pintar Negara, Universiti Kebangsaan Malaysia who met the criteria for gifted and talented students as developed by Md Jais and Azu (2020) in that they were more matured compared to their peers and possessed an IQ level greater than 130. The research population consisted of 465 gifted students from Foundation 1 to Level 2 between the ages of 11 and 17, comprising 231 male (49.7%) and 234 female (50.3%) students. These are students who passed the gifted screening tests (IQ testing) in Malaysia education system known as UKM1, UKM2, and UKM3. From this population, the research sample was selected. This involved 305 gifted and talented students – 138 male (45.2%) and 167

female (54.8%) – of whom 202 were from urban areas (66.2%) and 103 from rural areas (33.7 %). Based on the proposal of Krejcie and Morgan (1970), this sample size is parallel to the population size and is suitable for research purposes.

Instruments

Data were collected using a questionnaire comprising 21 items that measured the four effectiveness domains as follows: learning facilities (5 items), assignments (7 items), motivation (5 items), and online class skills (4 items). Responses were made on a five-point Likert scale (1: Strongly Disagree, 2: Disagree, 3: Quite Agree, 4: Agree, 5: Strongly Agree). The questionnaire was developed through mapping the instruments employed in studies by Norasyikin and Mohd Isa (2017) and Tuntirojanawong (2013). A pilot study was conducted with 96 students indicated that the reliability of the instrument was high ($\alpha = 0.94$), as suggested by Sekaran and Bougie (2013). The distribution of items according to subscale is presented in Table 1.

Table 1
Item Distribution of the Effectiveness of Online Distance Education

Subscale	Item Number	Total Item
Facilities	C1,C2,C3,C4,C5	5
Assignment	C6,C7,C8,C9,C10,C11,C12	7
Motivation	C13,C14,C15,C16.C17	5
Online Class Skills	C18,C19,C20,C21	4

Procedure

Gifted students were exposed to online distance learning for a period of four weeks. During this time, they learnt subjects such as Mathematics, Biology, Chemistry, English, Islamic Education, Music Education, and Physical Education through virtual platforms like Google Meet, Zoom, Google Classroom, WhatsApp, Telegram, and YouTube. All assignments were submitted through Google Classroom. Students were provided with a class timetable and they had to attend every subject for 1 hour using a computer or a smartphone. Sample of timetable is shown in Figure 2.

	08:00 – 08:30	08:30 – 09:30	10:00 – 11:00	11:30 – 12:30	12:30 – 14:00	14:00 – 15:00	15:00 – 16:00	16:00 – 17:00
Mo	HR	PHY MR SYAHRUL	MATH MS SYIMA	PAI UST SHAM	B	BHS+ UST SHAM / DR YEAP / DR NORMALIS	IC CHEM MDM MAHIRAH	IS
Tu	HR	BIO SIR SAIFUL	CHEM MDM MAHIRAH	ENG MS IYLIA	B	IC +MATH MS CRYSTAL	IC PHY MR SYAHRUL	IS
We	HR	PJK MR ZAIM	+MATH MS CRYSTAL	V.ART MR SHAFIZ	B	SD MR HAKIMIE	KOKO (P)	IS
Th	HR	KOKO (S)	BM PN SYUHADA	MUSIC MR AKBAR	B	IC BIO SIR SAIFUL	IC MATH MS SYIMA	IS
Fr	HR	SC UST SHAM / MDM SYAKINA / MS SYAMILAH / SIR RAJA	SEJ MS SYAMILAH	RSCH MR MADEE / MS AIN	BREAK		MORAL MR ZAIM	IS

Figure 2. Sample of Timetable for Online Distance Learning

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The summary of learning activities for each subject is shown in Table 2.

Table 2
Summary of Four Weeks Online Distance Learning Activities

Subjects	Topics	Activities
Mathematics Foundation 1	Introduction to Algebra	1. Pre-test: online short quiz using Quizizz. 2. Complete a Riddle in pair about the basic concept of Algebra. 3. Flipped Classroom: example and video on application of Algebraic Expression and Equation. 4. In a group of three, students carry out problem-based learning and prepare a poster presentation. 5. Individual assignment to solve Algebra equation.
Biology Foundation 3	Movement of Substances Across Membrane Plasma	1. Flipped Classroom: reading materials and video 2. Presentation during online session using Google Meet. 3. Online quiz using Quizizz. 4. Written task/essay submitted via Google Classroom. 5. Group assignment to prepare a digital membrane plasma and video presentation.
Chemistry Level 1	Chemical Formulae and Equation	1. Small group discussions using breakout room in Zoom. 2. Presentation of the results through small group discussions during class. 3. Online quiz using Google Form as individual assignment. 4. Assignment is submitted through Google Classroom.
English Foundation 2	Reading Writing Listening Speaking	1. Presentation using Canva and PowToon via Google Meet. 2. Discussion via breakout room in Zoom. 3. Online quizzes via Quizizz and Kahoot! through Telegram. 4. Watch videos in Zoom on certain topics and write reflection. 5. Watch movies on YouTube and write movie reviews. 6. Analyse online research articles through Google Scholars. 7. Notes and exercises uploaded on Google Classroom.

		8.	Individual assignment to answer quiz through Google Form.
Islamic Education Level 2	Hajj and Umrah	1.	Watched a video on real Hajj at Mecca on Google Meet.
		2.	List *rukun* Hajj using Padlet.
		3.	Create a video on Hajj demo.
		4.	Individual assignment to compare Hajj and Umrah and submit through Google Classroom.
Music Education Foundation 1	Malaysian Music History-Traditional Music	1.	Power Point presentation using Google Meet.
		2.	Watch Malaysian Traditional Music on YouTube via https://youtu.be/izRi0np91D4
		3.	Read notes from websites at https://www.roots.gov.sg/ich-landing/ich/traditional-malay-music
		4.	Analysis of research articles related to Malaysian traditional music in Google Scholars.
		5.	Online quiz using Kahoot and Google Form.
		6.	Create a Malaysian traditional video performance and submit through Google Classroom.
		7.	Discussion session through Google Meet and WhatsApp group.
Physical Education Level 2		1.	Video presentation by teacher and discussion through Google Meet.
		2.	Online quiz using Wordwall.
		3.	Video making related to Force and Motion Experiment from situation given.
		4.	Mind mapping activity using Canva.

Results

As indicated in Figure 3, 90 per cent of students were able to manage online classes using digital platforms such as Google Classroom, Quizizz, Kahoot, and Google Form. A total of 84 per cent were able to complete online assignments assigned by lecturers according to a flexible timetable, ease of reference, and convenience in submitting as well as receiving assignments. In overall, 77 per cent of students possessed online learning facilities such as a stable Internet connection, laptop, computer, and smartphone. However, only 56 per cent were motivated to learn online which means they were being confident, self-affirmative, interested, and experiencing less emotional stress during online learning sessions.

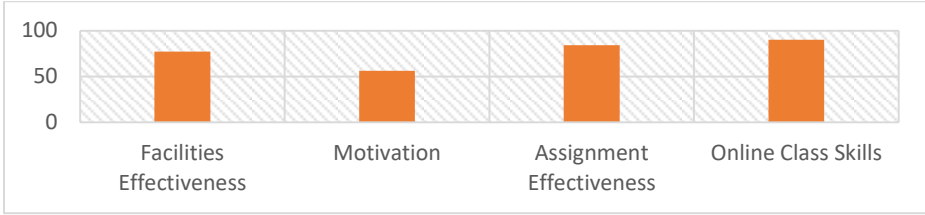**ONLINE DISTANCE LEARNING**

Figure 3: The Implementation of Online Distance Learning

As demonstrated by the mean score interpretations in Table 3 and mean values in Figure 4, students were able to manage online classes at a high level with a mean of 3.95. They were able to conduct online learning using digital facilities, complete online assignments, and have a level of motivation at medium levels of 3.51, 3.54, and 2.63, respectively. In general, the effectiveness of online learning is at a medium level with an overall mean score of 3.41.

Table 3
Mean Score Interpretation (Mohd Majid, 1990)

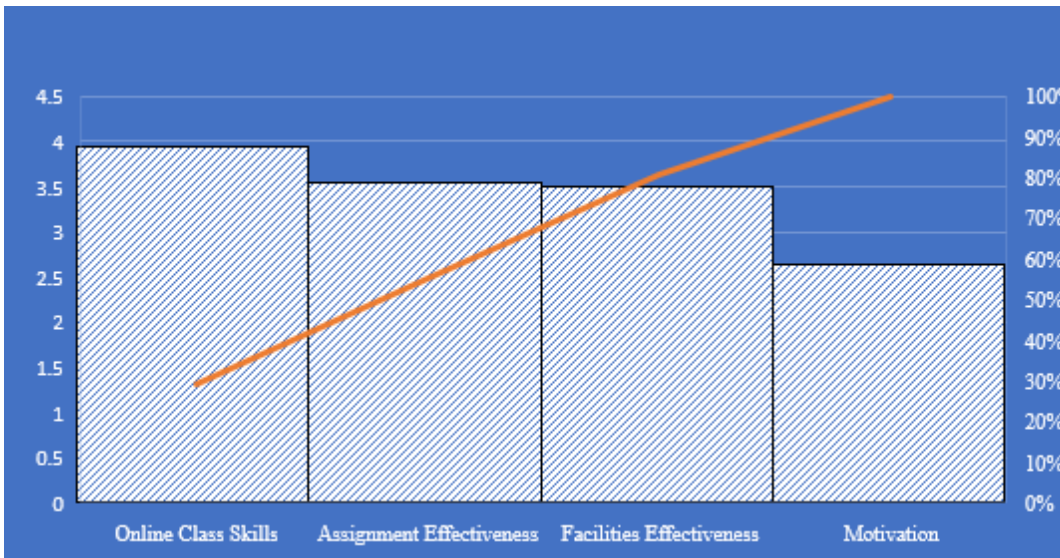| Score	Interpretation
1.00 – 2.33	Low
2.34 – 3.66	Medium
3.67 – 5.00	High

Figure 4: Mean values of Online Distance Learning

Comparison of Online Distance Learning between Gifted and Talented Students from Urban and Rural Areas

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As indicated in Figure 5, students from urban areas scored means of 3.65 for learning facilities, 3.57 for the ability to complete assignments, 2.66 for motivation when conducting online learning, and 4.04 for online class skills. This suggests that students who live in urban areas possess high online class skills and medium level scores in other domains. By comparison, students from rural areas scored means of 3.24 for learning facilities, 3.48 for the ability to complete assignments, 2.57 for motivation to conduct online learning, and 3.77 for online class skills. This shows that students who live in rural areas also have high online class skills and medium level scores in other domains.
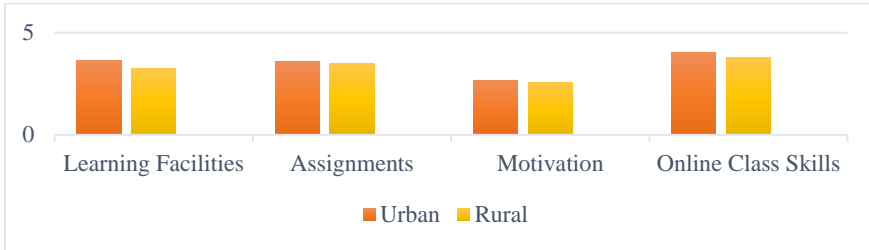

Figure 5: Comparison of Online Distance Learning between Gifted and Talented Students from Urban and Rural Areas

As presented in Table 4, the T-test result suggests a significant difference in online learning between students from urban and rural areas. Specifically, the scores of students from urban areas were higher in regard to learning facilities and online class skills ($\alpha < 0.05$). This suggests that students from urban areas have better learning facilities and higher skills compared to students from rural areas. However, no significant difference between students from urban and rural areas was found with respect to completing online assignments and motivation ($\alpha > 0.05$).

Table 4
Comparison of Learning Effectiveness Using a T-test

Variables	N	Mean	T-value	df	Sig.(2-tailed)
Learning Facilities	305		4.7	303	0.00
Assignments	305		1	303	0.31
Motivation	305		0.72	303	0.48
Online Class Skills	305		2.68	303	0.01

Discussion

The findings of this study indicate that learners' perception of online learning during the COVID-19 pandemic is positive. It demonstrates that gifted students perceived online learning to be extremely useful during this period. Students, as mentioned by Popovici and Mironov (2014), have shown a keen awareness of the variations brought by the digital technology and their influence on students' learning experiences. On the other hand, the findings contradict Keller and Cernerud (2002), who demonstrated that students

did not see e-learning as an advantage. Male students with high computer skill were shown to be less optimistic about e-learning in school than those with a favourable attitude towards new technologies. The current study does not only indicate that online learning is effective amid the COVID-19 pandemic but also elucidates the availability of Internet access, task efficiency, student motivation, and online learning skills.

Regarding ICT facilities, we suggest that schools should use social media applications such as WhatsApp and Telegram to make it easier for students to access online classes and tasks. This supports the findings of Mamattah (2016) where most respondents consider it costly to purchase digital gadgets for distance learning rather than face-to-face learning. In terms of the availability of assignments, individual tasks are perhaps better suited to maintaining the physical distance due to the pandemic, while group tasks can be undertaken to help friends who do not have digital tools and Internet access. With respect to students' skills, the findings are consistent with those of Mislinawati and Nurmasyitah (2018) who found students' knowledge of ICT in their everyday lives played an important role in their knowledge of online learning. While operating online, the materials and assignments must be well understood by students and preceded by a clear explanation. The results thus suggest that the materials and instructions used by the teacher in online learning were easy to understand.

In addition, online distance learning seems to be a proper learning method for gifted students. From the findings, it shows that gifted students from both urban and rural areas have the skills and motivation to participate in online learning. Although gifted students from rural areas face some issues related to facilities, it does not diminish their interest in taking part in online distance learning. Importantly, when students are interested to attend a class, they will enjoy the lesson and boost up their achievement (Khan et al., 2021; Hinduja et al., 2020). Therefore, by implementing online learning, gifted students in urban and rural areas may learn and perform well in both academic and non-academic fields. Not only that, they also show intense concentration and dedication to studying, and always seek opportunities to ask questions. The present study also indicates that gifted students understand what is being taught through online distance learning as they show positive feedback and are able to complete all the online assignments.

The distribution of technology (Google Classroom, Quizizz, Kahoot, and Google Form) literally bundles knowledge and instruction to give students access to educational experience. However, what really matters is the quality of the instructional message, rather than any inherent characteristics of the medium employed. Clarke (1983, as cited in Taylor, 1995) stressed that educational technologies are "pure vehicles that educate but don't affect student achievement any more than the truck that delivers our groceries causes changes in our nutrition". This indicates a need to distinguish clearly between the medium and the message. It is fully possible for a teacher to be accompanied by a team of audio-visual technicians, graphic designers, and computers to modify the way they convey the instructional message without dramatically increasing pedagogical effectiveness. Before claiming to be an expert in a certain subject, it is vital to do a comprehensive assessment of one's own knowledge and cognitive ability. Numerous

approaches, including cognitive analysis, novex analysis, and idea mapping, are utilised to create a collection of well-designed teaching and learning experiences that dramatically improve the quality of gifted teaching and learning experiences (Maker & Pease, 2021; Taylor, 1994; Ryder & Redding, 1993). This reflects a transition from the situation of a single teacher (often without formal technical training in education) to a multi-disciplinary team that applies a wide spectrum of specialist experience and who are responsible for planning, implementing, executing, and reviewing education programmes.

Based on the findings, it is found that gifted students prefer to adapt online distance learning compared to other students in mainstream schools. Tomlinson (2000) defined differentiation as customising instructions to fulfil students' individual needs and such differentiation can be categorised into four elements namely content, process, products and learning environment. Gifted and talented students at Pusat GENIUS@Pintar Negara have been exposed to Differentiated Instruction (DI) in both physical and virtual classrooms. As such, online distance learning works effectively on gifted and talented students because they are allowed to explore the lessons according to their needs. In addition, National Association of Gifted Children (2013) confirmed that gifted students are those "*exhibiting outstanding intellect, ability, or creative talent*" and having "*persistent intellectual curiosity*". This in a way suggests that gifted students with high ability, creativity and curiosity mostly find online distance learning tolerable and manageable. Unlike gifted students, a case study by Basar et al., (2021) proved that non-gifted or average students are less motivated when the learning has to be done virtually and they view conventional or face-to-face learning as more significant.

Through this study, we realise that there are advantages of distance learning for gifted learners. The flexibility of distance learning provides chances to gifted students to work on assignments from home, and students may work more autonomously than in the classroom. When education can be offered at the time and location where it is required, costs are decreased, and students may easily connect to other students as they become more linked to one another. There are several chances for gifted students to obtain materials in a short time and this allows them to communicate with other individuals from all around the globe. It provides students with the opportunity to interact with other students who share their interests in academics. Moreover, distance learning permits gifted students to interact with each other in a unique manner. Through virtual environment, gifted students may learn about different countries and cultures from their own homes. Rural gifted students may be exposed to cutting-edge computer technology while learning about telecommunications via distance education. It is possible for students to learn about occupations, school courses, and role models that they wouldn't have otherwise been exposed to. With the ease and cost-effectiveness of distance education, both school and students get the benefits.

Conclusion

While there are numerous learning strategies for gifted and talented students (Md Jais et al., 2021; Ismail et al., 2020; Kamis et al., 2018), the current researchers conclude that the only successful method of learning during the MCO due to the COVID-

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19 pandemic has been through online distance learning. Although research findings indicate that its effectiveness is low, the researchers are persuaded that if the approach can be improved with a more careful preparation, this will enhance the quality and effectiveness of online distance learning. Results in the present study show a significant difference in online learning between students from urban and rural areas. Specifically, the scores of students from urban areas are higher in learning facilities and online class skills while students from rural areas have lack of learning facilities and skills. It is recommended to the government and school officials to closely monitor rural gifted students and provide facilities for them. An allocation from the national budget for instance could be channelled to rural schools and students to make online distance learning happen and successful. Community and parents can also play their roles to ensure all students are well catered and equipped with necessary learning materials to implement online distance learning. The findings from other studies signify that online distance learning methods are applied in different countries in accordance with their cultural perspectives and arrangements. Nonetheless, in critical times such as these, education using virtual platforms with high-tech learning facilities is essential. While it remains to be seen whether this is relevant to post-COVID-19 e-learning, it is one of the few places where innovation has not ceased. The importance of disseminating information across continents, industries, and all aspects of society has been made clear by this pandemic. It is incumbent upon all gifted practitioners to explore the full potential of online learning technology. Thus, we propose potential research priorities to cover developments in the gifted education system with respect to distance learning, implementation of high-tech learning facilities (especially for rural students), as well as an assessment of distance education in the gifted and talented education sector.

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