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CHALLENGES FACING TEACHERS WHILE USING MICROSOFT TEAMS IN E- LEARNING DURING COVID-19

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Abstract

E- Learning is flexible and useful source which enable students to get their knowledge in emergency and help them to become self-directed learners. This is a qualitative study aims to examine the challenges that face the teacher during the employment of teams app. The study was carried out in the second semester of the scholastic year 2020/2021. It consisted from five teachers from Ezaria Girl's Secondary school in different subjects to investigate the challenges which face teachers. The researcher adopted semi-structured and focused group interview to collect the data from the participants and answer the study questions. The data were analyzed by thematic analysis the reveal that there are three challenges face teachers; technological, pedagogical, and social in addition to the ethical challenges. The researcher recommended that The Ministry of Education should provide with more platforms to increase the access to the internet and hold more workshops to train both teachers and students to improve their technological, pedagogical, ethical, and social skill to E- learning.

Key words: Microsoft Teams, E- learning, Covid-19.

1. INTRODUCTION

Covid-19 pandemic has changed the way of teaching and learning around the world. Social distancing was adopted to contain the problem. Many countries around the world decided to close down school to stop the spread of the virus. Many educators and teachers around the world stated to think in a way to continue the learning process [6]. Technology way very supporting in that. Many countries and organizations including UNESCO, (2020) (United Nations of Educational Scientific and cultural organization) supported this opinion. These countries asked all people to shift their learning from face to face into E- learning to stop the spread of the virus by avoiding direct connection between people.

The growth of E- learning broke down the geographical and social boundaries between countries. It brought distance learning education and infrastructure [13]. E- learning brought many benefits for students; it increases interaction and by providing asynchronous and synchronous tools such as e-mails, forums, chat .It increased the contribute with the content [16].E- learning platforms provides many advantages to the students; they can control over the content and better communication with students. It can enhance the learning process [20] in the same time, on line learning has changed all aspects of human life. Online education has provided many opportunities for both teachers and students. There are many organizations try to improve resources and collaboration on curriculum development [15]. Online learning can be define as instruction delivers on a digital device to support teaching [5]. There are many advantages to online learning; it saves time, flexible, enjoyable, and no crowd. It is also

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help both teachers and students to be in touch during the emergency and remote teaching [6].

On the other hand, using E- learning in education produce some challenges such as the delayed feedback, the absence of physical apace, unavailable teacher ,feel isolation, and the decrease of human interaction and motivation [26]. These challenges can be overcome by the use of the teacher and stakeholders when they increase using platforms, increase teaching strategies, using another tools such as TV, and integrate all students to participate in the learning process to achieve the equality in education. Teachers also may feel isolated, if so they have to adopt E- learning strategies to overcome isolation and provide suitable online learning environment [26]. In responding to this gap in knowledge, this study came to investigate the Challenges Facing Teachers while using Microsoft Teams in E- learning During Covid-19 Pandemic: A Case Study in order to shed light on them and try to help both teachers and students to overcome them and succeed in employing E- learning education.

2. LITERATURE REVIEW

2.1 Online and E-learning

E- Learning has spread as an aid of online learning. It enables teachers to continue their learning process during Covid-19 spread. It played a vital role in the flexibility of the learning process which accessed easily and better to students [23]. Above all, it fosters interactive and communicative approach within the context of teaching and learning [8]. In simple way, E- learning is defined as a system of using information and technology to create a system of education [9]. It is also defined as concept that uses electronic media to supply with online teaching and learning in formal education. It is clear that Elearning is using electronic devices to meet peoples' need of knowledge [6]. Many studies conducted about the benefits of E-learning in education showed that E-learning has a strong effect on enhancing student's motivation and collaboration in education. It helped students to understand their lesson and increase their communication. E-Learning system is easy to access so that it created positive attitude towards education. In addition, it increased student's engagement and experience [4]. The effectiveness of using E- learning includes three elements: first, it refers to the teachers' awareness of using ICT and how to engage students in the learning process in order to not feel of isolation because of the absence of their physical colleagues. E- Learning is important in the case of shy students; who they don't speak up. Other studies provided the benefits of online learning; it saves time and money. Content can be easily updated via computer and internet to reach to online learning [1]. In fact E- learning is a new name for online learning. I depend on the access of the internet. Online learning help to deliver material from teachers to students.

2.2 E- learning through Covid-19 pandemic

All schools and institutions were shut down because of the spread of corona virus. Most of them were not ready to change into online learning, but some of them had positive attitudes towards using E- learning in education because it was the only way to

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continue the learning process. E- learning is necessary. But shifting towards online learning is not enough because students need to upload lectures and get some assignments to do. To achieve this access, some studies pointed out that there are some aspects involve: managing and developing internet infrastructure, using digital tools, using diverse courses, and using social network to build online communities for students [12].

2.3 Benefits of E- learning in education

The spread of using E- learning in education came from its popularity over traditional education. The use of E- learning leads to effective learning, good retention, better communication, and quick access to information. In addition to the good interaction between students and their teacher, cooperative learning, and achieve the quality of education because students are not restricted with the teacher in the same place in the same time. E- learning is a tool for meaningful and active learning [8]. [4] mentioned some benefits for E- learning, to mention some of them: The first is no restrictions or boundaries; it facilitate learning without organizing when and where. Second, it enhances engagement and makes the learning process more fun. The third is, low cost; students don't need to have new editions like face to face material. It is clear that integrating E- learning in education achieve quality education. It foster students' and teachers' collaboration, engagement, access to digital resources. It saves time and efforts. It is benefit for shy students and help teachers to continue the learning process and develop the technological aspects of both teachers and students. Above all, it facilitated the access to education.

2.4 Benefits of Microsoft Teams in Education

Microsoft Teams: is a digital app, helps to bring conversation, content. Using teams helps teachers to move easily and quickly from the conversation to the content to enable students work together and get their needs.

There are many benefits behind using Microsoft teams in education, to mention them: All students will stay in one digital environment with one material. It is also help students to engage in the learning process. Then, it eases management and help users to get tools they need in education. Next, enable students to collaborate with each other, it personalize learning based on educators' need to improve outcomes. In addition, it helps to ensure students' safety and manage policies. Using such an app help students to participate in the learning process; it makes learning part of their daily life [17]. Teams allow a higher number of users without time limitation [2].

2.5 Challenges

Online learning has allowed many societies around the world to continue their learning during Covid-19 closure. Of course this shift towards E- learning has many pros and cons. Despite of its benefits, using E- learning in education faces many challenges. This study came to discuss some of the open challenges that were facing teachers during their E- learning teaching process [12]. [9] Stated some obstacles that are facing teachers in E- learning they were as follow:

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2.5.1 Technological Challenges: such as the access to the technological devices, the lack of resources, infrastructure, internet service, the lack of teachers' ICT skills, the lack of teachers' training and guideline such as providing with interactive multimedia material instead of the current curriculum therefore, interaction leads to strong learning outcomes [18]. [8] Pointed out that the challenges in using E- learning are insufficient infrastructure, the student's different levels of technological skills, and the shortage of recourses and the lack in teachers' training, and training requirement. In addition to the shortage of peoples' readiness of using E- learning. In addition to the access level as [19] mentioned. [18] Pointed out that the high cost of implementing ICT in education. Some teachers and students don't have personal computer or internet connection. Hardware and software cost still very high in poorer areas such as villages comparing with the richer areas or the city. [13] Explained that there are two kinds of training for E-learning teachers, they are: in-depth training for teachers who keep using E- learning and shorter training for teachers who use E- learning and face to face as blended learning.

2.5.2 Pedagogical Challenges

Such as the interactive and well-designed material to keep students motivating, the lack of the system of assessment and immediate feedback [2], [21] Pointed out that using Elearning in education need more efforts to prepare material and teaching methods based on pedagogy and technology. It should base on pedagogy. [2] Revealed in his study that students' learning style is another challenge that face teachers in E- learning. Every student has its own learning style so this was an obstacle to teachers to prepare an interactive material which suits their learning style to achieve better learning outcomes. The problem is that the teacher should know all students learning styles and taking them into account when they design E- learning material. Students' learning styles are not clear during E- learning education. Some students learn through interacting, others prefer visual, some students prefer listening. This variety of Elearning brings challenges to the teacher during E- learning education. Knowing each student learning style is important to change learning into self-directed learning. Students will be able to think if teacher understand their way of learning. They will also be able to communicate with peers and become independent learner. Teachers will be able to use guezzes, discution, group work, self-assessment and research for the purpose of critical thinking [9]. They will be able to motivate students and show empathy because good attitudes towards technology leads to good outcomes [13].

2.5.3 Social Challenges

Such as the lack of suitable home environment to gain a good learning and the lack of parents' support because of the lack in ICT skills and poor background in home-based learning [7]. [19] Mentioned that communication and participation skills, and the lack of computer skills to work with computer and internet stands in front of implementing ICT in education. According to [3] teachers need suitable and interactive tools and assistance to help teachers develop computer-based project. Besides to the lack of ICT support; aids may break during the lesson. It must be a stuff who has the ability to help in repaire. [22] Pointed out that if the teaching staff are not trained, students will suffer.

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Time management is another challenge that mentioned by [2] he said that students should register in E- learning platform before coming to class, they should prepare their material, and check the availability of the internet. Next, [9] added that the resistance to change is another challenges which satand in front of ICT use; some people refuse to use new methods if they don't get benefits, while others refuse so if they don't have and background about this tool. They prefere to contuinue their traditional teaching on using ICT. Besides, sometimes teachers feels that they lost the control on students; they feel" left in the dark" when they aren't able to see and interact with students [5]. Studen's expectation could be another challenge [15] added that students inappropriate expectation in talking their feedback or assessment and don't take deadline for the assignment seriously. [11] Added that not all learners succeed in the participation of online education. Teacher should be ready to help his students to be self-motivated. [14] Added that learners may feel isolated in E-learning education. In addition, Wise [24] suggested that learners don't participate in E- learning; they spend three quarters of their time observing and listening to the teacher. On the other hand, teachers sometimes don't participate and feel happy in e-leraning education because they tried face to face education for years so they will afraid of unknown or they don't have the ability to connect with students in E-learning environment. Some of the teachers afraid to be replaced with computers [14].

3. METHODOLOGY

It is a qualitative study. It was conducted in the scholastic year 2020/2021 from the second semester. The population of the study was selected from Al-Ezaria Girls' Secondary School. It contains 40 female teachers for different subjects. It is located in Al-Ezaria near Jerusalem city. The researcher chose this school because she works there and employed teams during E- learning after the spread of Covid-19.

3.1 Setting and Participants

The sample consisted of (5) teachers of different subjects in the same school; English, Arabic, Science, Maths, Religion, and history. They teach 7th to 12th stage. The researchers chose these six teachers because of two reasons: They employed teams permanently and they accepted to participate in this study without hesitation. They are as follow:

Safa'a: Teacher of English since 10 years, she has MA degree in teaching methods, she live in Ezaria. She's 38 years.

Muna: Science teacher, she has been teaching since 15 years, she has a BA degree in Biology, she lives in Bethany. She's 39 years.

Anhar: Arabic teacher, she has a BA degree in Arabic teaching methods, she has been teaching since 8 years, she live in Bethany, she's 39 years old.

Anan: she has MA degree in Islamic religion, she has been teaching for 20 years, she live in Abu-Dis (town near Ezaria), and she's 45 years.

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Khitam: she has a BA degree in Civics, she has been teaching since 25 years, she's 55 years, and she lives in Abu-Dis.

3.2 Data collection methods

Data will collect online via zoom app. The researcher prepared interview protocol questions and ask each teacher questions for (15) minutes about their experience with teams during Covid-19 pandemic. During the second semester 2021/2022. The participation will receive information at the beginning about the interview. The researcher recorded the interview after asking the participants' permission.

3.3 Data Analysis

After collecting the data from the participants by adopting a semi-structured and focused group, the researchers analyzed the data using thematic analysis by classifying the data into themes and sub-theme then they divided the theme into main and minor dimensions to answer each question from the protocol of the interview.

3.4 The research Instrument:

The researchers designed a protocol after revising the literature. The protocol will ask the teachers about the problems they face during employing teams in education as a forum of E- learning. The protocol consists of demographic information at the beginning (name, age, and years of teaching, subject) (see appendix 1). It contains open ended questions. It is a semi-structured interview to answer the main research question: What are the Challenges Facing Teachers while using Microsoft Teams in E- learning During Covid-19 Pandemic? The researcher added three sub- questions to answer the main questions: (1) what are the technological challenges that face you during your teaching via teams? (2) What are the social challenges that face you during your teaching via teams? (3) What are the social challenges that face you during your teaching via teams?

3.4.1 Challenges that face students while using teams

There are many challenges that face teachers and students during the use of teams. Technological challenges [13], pedagogical challenges [2], and social [14]. Above all, there are ethical problems that appeared. Most of teachers suffer from it. Honestly is one of them. Students were not honest to deal with E- learning.

3.4.2 Technological challenges

N said: "The badness of Microsoft white board, it needs high quality of internet. The written is unclear so the teachers needed a separated white board, but the school administration doesn't supply it because there was no enough school budget". Another teacher, R added: "The teachers of technology are not very professional in using teams, they weren't able to help teachers in any problem that face them". She added: "There is no encouragement from the administration itself". A pointed out: "Teams are not effective to use by students. Teachers used another app to connect with their teachers". Kh: "Teachers don't qualify enough to use technology, they don't be trained well to use teams. Teachers are not expert in fixing any problem will occur during E-

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learning class". S said: "Students also have a shortage idea in technological skills; they don't know how to use the app especially in sending and receiving homework's".

3.4.3 Pedagogical challenges

M sadid: "Teachers used to send feedback to students through messages instead of giving it in front of others". A added: Teachers use work sheets as an assessment tools, and apps like Google drive to assess students' work. There is no direct assessment".R said: "There is no interactive material or suitable curriculum for Elearning". A noted that: "Each student has its learning style, so teachers couldn't determine the learning style of each one". In addition, said: "The lack of infrastructure and the lack of teachers' knowledge of the assessment online tools". Kh said: "I don't have enough experience in technology, so I feel I am isolated from others". She added: "Sometimes I asked help from others".

3.4.4 Social challenges

N said: "The sudden visit from relatives and neighbours; E- learning was a problem for me because there was no fixed time to start like face to face learning". S added: "Students traditions and customed don't allow their children to open camera or video through the lesson leads to ethical problems". A&M said: "Students open the app and don't commitment in observing the class. Some of student's aks their brothers or sisters help". A added: "sometimes asked their mothers to observe the class instead of them". Besides, A: "cheating in online exams. In addition, to the shortage of parents' awareness of the benefits of using technology". R said: "Parents don't allow their children to open teams in any time during the day". N&S: said: "Parents don't have enough budget to supply computers to their children. Some teachers refuses to use new apps because they don't have the special skills to use. Most students and teachers feel isolated"

4. CONCLUSION AND DISCUSSION

Using technology is like a weapon with two edges. Team's app is one of the most important app which has been used during COVID-19 pandamic. Teachers and students have faced many problems and challenges during employing it. The first and the most famous problems were the technological ones. Teachers' lack of ICT skills as [18] pointed out. In addition to the lack of school infrastructure and environment as [8] revealed. Teachers and students were suffering from that because that was new experience for them and because of the sudden shift toward technology. [18] Pointed out that people specially teachers were not ready to use technology, and teach remotely. This leads to pedagogical and social skills [25]. Teachers were not be trained enough to use E- learning apps. Next, there were pedagogical problems such as feeling isolated of others. Each student has his own learning style, so in E-learning, teachers can't determine each student's learning style as [2] revealed. In addition, E- learning needs more efforts to prepare for the class. It was a big problem because this is the first time that teachers employ technology in teaching and learning. There were lack of Elearning assessment tools. Teachers used to employ traditional ways of assessment which are not suitable for E- learning, this is what [16] [27] revealed. The third challenge

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was the social challenges. Many social challenges has led to ethical problems. Most students aked their parents, brothers, or sisters to observe classes instead of them. Most of students didn't obsereve classes; they opened the app and leave. Finally, social challenges, most teachers were suffereing from the lack of suitable environment this was pointed out by [25] [7]. There is no suitable time to start the class on. In addition, some of teachers and students are suffereing from the lack of computer skills, they don't use it very well, and this is stressed by [19]. Tearchers also suffer from social interaction between them and students; teachers, and atudents feel isolated this assured by [3]. On the other hands, most teachers resist change; they as the results of this research show and as [2] revealed in his study. Besides, there are no suitable E- learning curriculum, assessment tools, and immediate feedback to give to students.

5. RECOMMENDATIONS

- The Ministry of Education should provide with more platforms to increase the access to the internet and interactive material.
- More workshops to train both teachers and students to improve their technological, pedagogical, and social skill to E- learning.
- Reduce cognitive loads on teachers which stand in the way of being interactive teaching.
- Policy makers should produce more interactive games to gamify education.
- Use TV channels to facilitate the access to E- learning material in the absence of the access to internet connection or interactive material.
- Benefit from post office service to deliver hard copy material to people in remote areas.
- Encourage parents to engage with the learning process in line with their children to encourage them to participate in the learning process.
- Planning E- learning material by developing contents.
- Provision of infrastructure that support ICT use.

References

- 1. Al-Dosari, H. (2011). Faculty members and students perceptions of E- learning in the English department: A project evaluation. *Journal of Social Sciences*, 7(3), 291.
- 2. Andayani, R., Aulia, H. R., & Bilqis, M. (2020, May). Challenges and Successes: A Teacher's Reflection on E- learning Exertion. In *IOP Conference Series: Earth and Environmental Science* (Vol. 485, No. 1, p. 012094). IOP Publishing.
- 3. Barret, W. (2008). Making the necessary changes for the education system to meet the changing needs of the 21 st century. *Retrieved on*, *5*(12), 11.
- 4. Burac, M. A. P., Fernandez, J. M., Cruz, M. M. A., & Cruz, J. D. (2019, February). Assessing the impact of E- learning system of higher education institution's instructors and students. In *IOP*

ISSN: 1671-5497

E-Publication: Online Open Access

Vol: 42 Issue: 03-2023

DOI 10.17605/OSF.IO/DTCZ2

Conference Series: Materials Science and Engineering (Vol. 482, No. 1, p. 012009). IOP Publishing.

- 5. Conrad, D. (2004). University instructors' reflections on their first online teaching experiences. *Journal of Asynchronous Learning Networks*, 8(2), 31-44.Clark, R.C.; Mayer, R.E. Elearning and the Science of Instruction, 4th ed.; Wiley: Hoboken, NJ, USA, 2016.
- 6. Coman, C., Ţîru, L. G., Meseṣan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: students' perspective. *Sustainability*, *12*(24), 10367.Drane, C.; Vernon, L.; O'Shea, S. The Impact of 'Learning at Home' on the Educational Outcomes of Vulnerable
- 7. Doyle, O. (2020). COVID-19: Exacerbating educational inequalities. *Public Policy*.
- 8. Felea, M., Albăstroiu, I., Vasiliu, C., & Georgescu, B. (2018). E- learning in higher education: exploratory survey among Romanian students. In *The International Scientific Conference eLearning and Software for Education* (Vol. 4, pp. 157-162). "Carol I" National Defence University.
- 9. Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies*, *10*(4), 86.
- 10. Fischer, H., Heise, L., Heinz, M., Moebius, K., & Koehler, T. (2014). E- learning Trends and Hypes in Academic Teaching. Methodology and Findings of a Trend Study. *International Association for Development of the Information Society*.
- 11. Hung, M. L., Chou, C., Chen, C. H., & Own, Z. Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education*, *55*(3), 1080-1090.
- 12. Huang, R. H., Liu, D. J., Tlili, A., Yang, J. F., & Wang, H. H. (2020). Handbook on facilitating flexible learning during educational disruption: The Chinese experience in maintaining undisrupted learning in COVID-19 outbreak. *Beijing: Smart Learning Institute of Beijing Normal University*, 1-54
- 13. Islam, N., Beer, M., & Slack, F. (2015). E- learning challenges faced by academics in higher education. *Journal of Education and Training Studies*, *3*(5), 102-112.
- 14. Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. *Journal of Educational Technology Systems*, *46*(1), 4-29.
- 15. Limperos, A. M., Buckner, M. M., Kaufmann, R., & Frisby, B. N. (2015). Online teaching and technological affordances: An experimental investigation into the impact of modality and clarity on perceived and actual learning. *Computers & Education*, 83, 1-9.
- 16. Mukhtar, K., Javed, K., Arooj, M., & Sethi, A. (2020). Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era. *Pakistan journal of medical sciences*, 36(COVID19-S4), S27.]
- 17. Olinger, D.Kellermann,D.(2018). 10 benefits of Microsoft Teams for education. Microsoft, 2018http://edudownloads.azureedge.net/msdownloads/The_Total_Economic_Impact_of_Microsoft _365_Education.pdf Figures representative of those experienced by the schools interviewed and applied to a composite organization of 60,000 students and 5,500 teachers and projected forward for three years.
- 18. Outhwaite, L. (2020). *Inequalities in resources in the home learning environment* (No. 2). Centre for Education Policy and Equalising Opportunities, UCL Institute of Education.
- 19. Rasouli, A., Rahbania, Z., & Attaran, M. (2016). Students' Readiness for E- learning Application in Higher Education. *Malaysian Online Journal of Educational Technology*, *4*(3), 51-64.

ISSN: 1671-5497

E-Publication: Online Open Access

Vol: 42 Issue: 03-2023 DOI 10.17605/OSF.IO/DTCZ2

20. Suresh, M., Vishnu Priya, V., & Gayathri, R. (2018). Effect of E- learning on academic performance of undergraduate students. *Drug Invention Today*, *10*(9).

- 21. Tyilo, N. (2017). E- learning as instructional innovation in higher education institutions (HEI's): Lessons learnt from the literature. *Journal of Communication*, *8*(1), 87-93.
- 22. Taylor, R. W. (2002). Pros and cons of online learning—a faculty perspective. *Journal of European Industrial Training*.
- 23. Xhaferi, G., Bahiti, R., & Imeri, F. (2015). Integrating LMS in Teaching and Learning Process in State University of Tetovo: Issues and Challenges. In *International Scientific Conference Computer Science*.
- 24. Wise, A. F., Speer, J., Marbouti, F., & Hsiao, Y. T. (2013). Broadening the notion of participation in online discussions: Examining patterns in learners' online listening behaviors. *Instructional Science*, *41*(2), 323-343.
- 25. Wang, X. (2022). Influences of Learning Emotion on Learning Outcome in Online Teaching Mode. International Journal of Emerging Technologies in Learning (iJET), 17(08), pp. 126–139.
- 26. Yusuf, B. N., & Jihan, A. (2020). Are we prepared enough? A case study of challenges in online learning in a private higher learning institution during the Covid-19 outbreaks. *Advances in Social Sciences Research Journal*, 7(5), 205-212.
- 27. Zhang, C. ., Gao, M. ., Song, W. ., & Liu, C. . . (2022). Formative Evaluation of College Students' Online English Learning Based on Learning Behavior Analysis. *International Journal of Emerging Technologies in Learning (iJET)*, 17(10), pp. 240–255.