UNIVERSITI TEKNOLOGI MARA
Institute Of Continuing Education & Professional Studies

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

VOLUME 19 NO.1
JANUARY 2024
ISSN 2229-8223

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

Ms. Haslinda Noradzan
Ms. Nor Azilah Mohd Asarani
Mr. Fazyudi Ahmad Nadzri
Mr. Zawawi Temyati

Women's Perspectives of Social Media for Coping

Sharon Grace Kwan
Faculty of Social Science & Humanities, Universiti Malaysia Sabah (UMS),
Jalan UMS, 88400 Kota Kinabalu, Sabah, Malaysia
sharon_grace_kwan_ma21@iluv.ums.edu.my

Received: 15 November 2024
Accepted: 25 December 2024
Date Published Online: 1 January 2024
Published: 1 January 2024

Abstract: *This paper analyses women's experience of consuming TikTok to cope with everyday stress.*
Our objectives are to examine the significant meanings of TikTok to women as a coping tool, to explore the motivations behind women's engagement with the platform for stress and emotion management, including to investigate the relationship between women's social and economic conditions and their consumption of TikTok for stress-coping. The investigation is carried out by conducting semi-structured interviews to collect qualitative data. Six women were purposively sampled from a lower-income (B40) background who all use TikTok. Our results indicate several positive outcomes in women's stress and emotion management, particularly in managing work and personal stressors when consuming TikTok. Moreover, the results revealed that TikTok does not necessarily gratifiy as a tool for social validation but rather as a tool to comprehend and cope with women's stress. Additionally, TikTok positively affects women by encouraging them to seek self-betterment through its various media channels of entertainment, information, and distraction. The implications of this paper could be used to better understand the nature of stress that women face in this current era, and how social media is capable of becoming an effective tool for stress-coping.

Keywords: *Media Consumption, Social Media, Stress & Coping, Women*

INTRODUCTION

In recent years, communication scholars have debated over the mediatisation of everyday life and its impact on our stress experiences, reflecting on how social media (such as TikTok) may lead to media addiction and social media fatigue. Despite the contingency of social media being perceived to cause stress, it can easily be used for coping with our everyday stress and has, presently, become even more prevalent in our media-saturated world since social media has already changed our normative ways of communicating, as well as information and entertainment-seeking, including our ways of fulfilling our intrinsic needs (Nabi et al., 2017; Hampton et al., 2014). Apart from serving as a means for socialisation and information-sharing (Revathy et al., 2018), social media is also capable of cultivating positive emotional patterns like happiness, contentment, and joyfulness (Najmul-Islam et al., 2022; Costescu et al., 2021). Media channels within social media can also gratify various coping needs, such as enhancing our access to professional services, social support, and information related to stress management and coping processes (Wolfers & Schneider, 2021; Nabi et al., 2017).

Stress is a condition, or refers to the emotions we feel when under excessive demands that exceed our internal or external conditions (Selye, 1982). According to Pearlin (1989), we simply cannot exist without experiencing stress, emphasising that stress is a natural reaction to protect ourselves against real or imagined danger. While there are occasions where stress can be useful, especially in encouraging adaptation and development (Maddi, 2006), excessive stress, if not coped with effectively, can severely affect our physical and psychological health (Carver, 2007; Cohen et al., 2007).

Coping refers to the instinctive response we take in attempts to avoid or lessen the impact of stress (Pearlin, 1989). Our acts of coping are distinctive since it varies between the nature or context of our perceived threats. Research inferred that there are four distinct forms of coping orientations which are (1) approach coping; (2) avoidance coping; (3) problem-solving coping; and (4) emotion-focused coping. Approach coping refers to the engagement of seeking coping strategies that can reduce, eliminate, or manage the stressor.

On the contrary, avoidance coping refers to the disengagement of coping by ignoring, avoiding, and physically or emotionally withdrawing from the stressor. Problem-focused coping involves seeking strategies to change or eliminate the stressor, whereas emotion-focused coping involves strategies to reduce or manage the emotional consequences drawn from the stressor (Knobloch-Westerwick et al., 2009). Often, these approaches are combined to manage any given stressful event.

While there is a plethora of research on stress experiences and coping mechanisms, including topics related to media consumption and its impact on people's everyday lives, there seems to be a gap within emerging research regarding the relationship between our stress experiences and coping via media; specifically, from the women's perspective, their stress experiences, and why and how they consume social media to cope with their everyday stress. Thus, the purpose of this paper is to examine the significant meanings of TikTok to women as a coping tool. In addition, we are interested in exploring the motivations behind women's engagement with the platform for stress and emotion management. Finally, we investigate the relationship between women's social and economic conditions and their consumption of TikTok for stress-coping. This paper aims to contribute to the present literature in two ways. Firstly, we focus on outcome factors that have not been explored in social media research, particularly in the understanding of how TikTok can aid women in fulfilling their intrinsic needs and coping with their daily stresses, including TikTok's role in satisfying interpersonal emotional gratification (e.g., self-expression, social support, and information or entertainment channel) where the act of coping can occur. This paper's second contribution is the impact of TikTok in women's home and work environments. Because our participants are women from the lower-income (B40) background, we pay mindful attention to their motivations for consuming TikTok as a personal coping space.

2. METHODS

Samples and data collection procedure

Six women were purposively sampled from a diverse group (Table I) to gain a range of perspectives on their stress experiences and consumption practices, which may or may not be related to their social and economic

conditions. Our selection criteria included married and unmarried women aged 25 to 35, classified under the B40 group, and actively using TikTok. The "B40" classification pertains to the Malaysian household income group with a month-median income of RM4,850 and below. All interviews were conducted individually by the researcher in person or via online meetings (such as Google Meet or Webex), and participants were given a summary of the research, its objectives, and a consent form for a recorded interview. The mean interview duration was 45 minutes (range 25min – 1hr 10min). The researcher used a semi-structured approach with a prepared questionnaire outline to ensure consistent data collection. Interview questions included inquiries about participants' stress experiences at work and home, preferred genres of TikTok videos, and their coping practices. Participants also had the opportunity to report on the current effects of their stress. Our participants are from the different ethnicities in Malaysia, consisting of Malay, Chinese, Bidayuh, Iban, and Kenyah. They are also employed (either full-time or part-time) in various industries like administration, education, information technology, medicine, and real estate. Only one participant is currently working freelance (categorised as Unemployed) as a caretaker. Table I provides a summary of the demographic characteristics and work-related information of the samples.

Table I. Participants' Demographic

	Category	**Married**	**Unmarried**
Age	25 – 30	2	2
	31 – 35	1	1
Ethnicity	Malay	-	2
	Chinese	-	1
	Others (e.g., Bidayuh, Iban, Kadazan-Dusun, Bajau, Kayan, etc.)	3	-
Working Status	Paid Employment (Full / Part Time)	2	3
	Unemployed (e.g., Freelance)	1	-
Household Members	1 – 3	-	3
	3 – 5	2	-
	More than 5	1	-
Income	Below RM1,000	1	-
	RM1,000 – RM2,000	1	1
	RM2,000 – RM3,000	-	1
	RM3,000 – RM4,850	1	1
Total		**3**	**3**

3. DATA ANALYSIS

After transcribing the collected interview data, the researcher analysed, decoded, and verified all data. Transcribing the interviews helped the researcher to understand each participant's perspectives and compare them with other relevant data. Through data analysis, the researcher identified specific themes that emerged from participants' responses, leading the data to be analysed thematically with incorporations of a conceptual framework (Table II). Thematic analysis is generally applied to qualitative data, in which the researcher arranges the data into categories after reviewing the variables. This analysis allows the researcher to work flexibly yet systematically, when identifying emerging patterns from a wide range of information (Braun & Clarke, 2012). Although the process of analysing the data is generally based on the researcher and their research questions and methodology, their codes can range from a set of themes, a framework or model with themes, indicators, and qualifications that are casually related to or between variables (Braun & Clarke, 2012). In the case of our paper, two themes have emerged between the participants throughout our interview sessions: (1) The characteristics of stress faced by women; and (2) Women's consumption of TikTok for coping.

4. CONCEPTUAL FRAMEWORK

Coping tendency. Coping tendencies were analysed with the Coping Orientation Analysis (Table II), a framework derived and later developed from the Problem-Focused and Emotion-Focused Coping by Lazarus & Folkman (1984) and the Coping Dimensions Derived Theoretically by Carver et al. (1989). In summary, both frameworks conceptualised a single coping strategy's distinctive function while simultaneously implementing it to complementary approaches. Since people may apply more than one coping tendency depending on their intrinsic needs or objectives, the combination or separation of each orientation can vary in coping practices and outcomes. Therefore, this framework helps the researcher systematically analyse participants' coping tendencies and effects across the four coping orientations (approach, avoidance, problem-solving, and emotion-focused coping). Likewise, rather than focusing on a particular type of coping orientation or stress outcome, the participants' tendencies can be captured

into a singular or combined strategy depending on their stressful experience, which the researcher can further analyse thematically.

Table II. Coping Orientation Analysis

Coping Orientation	Definition
Problem-solving coping	
Active coping	Process of taking active actions to eliminate / avoid the stressor or improve its effects (e.g., direct action)
Planning	The thoughts of how to cope with a stressor (e.g., planned action)
Suppression / Restraint coping	Putting the stressor aside, and waiting until an appropriate opportunity to act presents itself
Seeking social support	Seeking advice, assistance, or information
Emotion-focused coping	
Seeking social support for emotional reasons	Getting moral support, sympathy, or understanding
Positive reinterpretation & growth	Construing a stressful transaction in positive terms
Acceptance / Denial	Learning to accept / refuse the reality of a stressful situation
Turning to religion	Tendency to turn to religion in times of stress
"Less useful" coping	
Focus on and emotion-venting	Tendency to focus on whatever distress one is experiencing and to ventilate those feelings
Behavioural disengagement	Reducing one's effort to deal with the stressor, even giving up their attempts to attain goals of which the stressor is interfering
Mental disengagement	Attempts to distract oneself from thinking about the behaviour dimension or goal of which the stressor is interfering
Additional coping	
Humour	Dealing with negative emotions through humour
Substance use	Using substance to disengage from a stressor or to feel better

5. RESULTS

The characteristics of stress faced by women

This theme discusses the findings of our paper that explored the stress experienced by women in their everyday lives. The extension of this theme includes how women face, cope, or avoid their stressors, as well as the outcomes of their stressful experiences.

As the majority of our participants are employed full-time or part-time, their stress mainly stems from their work culture and environment. While they generally find their workload manageable, they anticipate it will become mentally and physically taxing when they simultaneously have to handle numerous tasks and high demands. Participants in fast-paced work environments frequently experience anxiousness and high-level stress due to excessive workload, insufficient manpower, and constant demand for proactive involvement in certain work aspects. On the other hand, participants in more established corporations have a structured workflow that enables them to manage their stress and energy. Nonetheless, they may experience stress when confronted with unpleasant social behaviours or the lack of guidance on a particular work task. Their experience can be compared in the excerpts below:

"I work in a fast-paced company, so there are a lot of things that we have to do, mostly because we are expected to be proactive and contributing. And since my office is an open-concept one, no partitions of even walls exist between us or the departments. I don't really have a space of my own. I can't relax. I always feel so anxious because the boss could just walk around or behind me."
(Participant 1)

"I have a great team who are very supportive of me, in work and in my personal life as they know me very well. We're very close. I also have a good leader who always understands and supports me. If I'm unable to handle my stress or situation, they would understand and assist me, guide me on how to find the best solution for it. Or they would give me time to sit back and relax, and to come back once I've calmed down." (Participant 5)

One participant had turned to freelancing by taking up caretaking jobs, to overcome a sudden financial crisis. Despite so, her freelance job does not always produce immediate demands and can therefore be mentally challenging, especially when she has to make ends meet for her family's sake. The following is an excerpt from the participant:

"I feel stressed because my husband just quit his job, so I'm stressed about things like how I am going to find money. So, this is why I'm currently doing freelancing, but even so, it's not instantaneous as in, there's not always going to be patients. I still need to wait for them to contact me and set their appointments." (Participant 4)

Apart from work environments, our participants also experience stress at home. Two of the three married participants live with their in-laws, while one lives independently with their family. Following this, two unmarried participants live with their families, while one lives alone in a rented unit. One participant who is living with more than five family members admits to finding it challenging to constantly experience role and ambience strains because she has to maintain a harmonious atmosphere while fulfilling her designated roles at home, which may or may not be equally distributed. Furthermore, she stated that she lacks privacy and self-expression due to limited space in the crowded household, leading her to withdraw from expressing her stress toward each other.

"I'm married and am staying with my in-laws. Certain things are very sensitive because it's not your brother or sister or your husband. Expressing myself would only make things harder,
and above all, my stress comes from them. The problems that I'm facing always stems from their side. I don't have my 'me-time', I don't have anyone who would understand me." (Participant 4)

Likewise, participants living with five or fewer family members also experience role strains, albeit to a lesser extent on ambience strains. Their stress primarily arises from the expectations of fulfilling domestic responsibilities such as cooking, cleaning, and caring for family members, despite being exhausted from work. However, we discovered that these participants tend to feel more relaxed at home than those residing in larger households because they have their personal space for self-expression and can manage stressful situations through flexible family dynamics.

"Sometimes my mom would expect me to instantly do the house chores when I just got off work even though she knows that I'm tired. So, we would bicker a bit there. But at home, I can relax. There's not really any stress at home." (Participant 3)

"Besides my husband and my kids mess up the house. I don't feel stress at home because they too help me feel calm… my kids' antics are funny, cute. And these kinds of things really help me destress." (Participant 6)

Additionally, family relationships play a significant role in how our participants experience and mediate their stress at home. Our findings revealed that participants who do not have close relationships with their family members tend to suppress their thoughts and emotions when stressed.

Contrarily, those with strong family relationships can seek comfort and closure on their stressful experiences at home, which subsequently results in better active coping and stress management. For married participants, having a supportive and understanding partner is crucial to their coping process; they report feeling emotionally and mentally better with their partner's support. Unmarried participants, however, are able to express their thoughts or emotions, seek validation, and process their stress better with supportive and understanding parents or parental figures. Our findings extend that when participants do not receive adequate support or understanding from their partners or parents, their home life and stress levels may be negatively affected.

"When I express my frustrations to my husband, and he shows no signs of support. I would feel even more stressed and frustrated. It torments me mentally and emotionally." (Participant 4)

"I don't talk to my family members about my stress. Because I didn't grow up in an environment where it was comfortable to share our emotions. Usually, we (family) just pretend it never happens, or hopes that it doesn't happen anymore." (Participant 1)

6. WOMEN'S CONSUMPTION OF TIKTOK FOR COPING

This theme discusses the findings of our paper that examined women's consumption of TikTok to cope with their everyday stress. Here, this theme comprises the genres of TikTok videos that women generally enjoy, the coping effects and outcomes of TikTok on their mental and emotional state, and finally, their social engagement patterns on the platform.

Our participants actively consume TikTok for various purposes such as entertainment, information and solution-seeking, staying up-to-date with current trends (e.g., beauty, fashion, and celebrities or influencers), keeping in contact with friends, including online shopping. The genre of videos that they generally enjoy are videos featuring funny animals (particularly cats), cooking or baking, cleaning or organising, product reviews, prank or skit videos, and feel-good or inspirational videos.

Apart from that, we found that working participants rely on TikTok for tips-and-tricks videos to improve their work performances and skill development. A participant shared that she would search for videos related to her profession or for specific work-related issues, and has learnt from various content creators of a similar profession. Often, these videos are about handling specific or general medical care and patient treatments. Another participant also shared that she would go on TikTok to help with her anxiety; she stated that she would usually watch videos from content creators who are licensed psychologists for information validity. Besides that, she would read through the videos' comment section for additional information; overall, she expressed extreme satisfaction with the newfound knowledge as she has learnt the different kinds of food that induce stress. Moreover, our unemployed participant would also watch tips-and-tricks videos on TikTok to improve her soft skills like, for instance, communication, language, critical thinking, and emotional management. This participant believed that enhancing these skills would personally benefit her in preparation for future employment opportunities.

Our findings also revealed that videos about cooking, baking, and domestic house chores (e.g., cleaning tips) positively affect the mood of our participants. They expressed high motivation to imitate the recipes and methods demonstrated in the videos. Our participants shared that they have

learnt recipes of Korean Fried Chicken, Western dishes, and healthy meal preps, amongst others, from the numerous recipes available on TikTok . Below are some excerpts of their experience:

"When I'm stressed, I would watch some cooking or baking videos. There are a few (TikTok) channels that I love to watch from and I always feel happy and relaxed." (Participant 2)

"I love following cooking recipes from TikTok because they not only help me feel calm but they also inspire me try out new dishes that I can share with my family." (Participant 6)

"I suck at folding my wardrobe. So, after watching those organizing or folding tutorials on TikTok, I've learnt to enjoy the process and now I can fold and organize my closet neatly." (Participant 5)

Regarding motivation, all participants take pleasure in shopping on TikTok Shop, mainly because of its affordable selections and lower shipping fees. During the interview sessions, we observed that participants became incredibly pleased when discussing their online shopping experiences and the variety of products available on the platform. Interestingly, they acknowledge that their impulse purchases are often a result or reaction to their stress, and thus, they consider their actions as a way to cope with their stress while simultaneously being a self-motivation to work harder. Further inquiries revealed that most of our participants would most likely purchase essential items for work purposes and rarely indulge in non-essential purchases. Only one participant admits her likeliness to purchase non-essential items for self-fulfilment.

When feeling overwhelmed, our findings revealed that participants would turn to TikTok to take their minds off their stressors. Their habit typically resulted in them finding content that either distracts or improves their mood; most commonly, these contents involved comedy and funny cat videos for entertainment. Besides, our participants also sought motivation from inspirational videos to help them cope with their long days at work or home. In addition, participants mentioned watching videos related to their religion or religious scripture to calm themselves down or feel enlightened. The following is an excerpt of this example:

"Somehow when I'm mentally drained, TikTok will always suggest me the Quran scriptures and whenever I watch these kinds of video, I feel that it really helps me relax mentally and emotionally." (Participant 2)

However, some participants are able to simultaneously distract and calm themselves down simply through passive scrolling:

"Sometimes I would overthink and even though I try to avoid the issues, I would still be thinking about it. So, the only way I could really unwind is by playing on my phone and scrolling through TikTok." (Participant 1)

"I would go on TikTok when I'm stressed and just scroll through the random videos. Some are quite repetitive but there are those that would catch my interest, like funny cat videos of cats falling down – I know it's bad to laugh but they are really funny!" (Participant 3)

Although our participants consume TikTok daily, they do not necessarily use it for social fulfilment. Most participants only post sporadically and have minimal interactions with friends or content creators on the platform, expressing that they are most satisfied as passive viewers. With that said, only one participant actively posts on TikTok, but not as herself. Instead, she portrays herself as a musician and enjoys sharing her videos on the platform. She shared that she appreciates receiving feedback and engagement from her viewers – primarily fellow musicians – since she viewed their feedback as being valuable to her musical skills. Through TikTok, she also connects with online friends with similar musical interests and talents.

7. DISCUSSION

The main objectives of this paper were to examine the significant meanings of TikTok to women as a coping tool, their motivations in engaging with the platform for stress and emotion management, and the relationship between their social and economic conditions to their consumption of TikTok for stress-coping. Our results strongly indicate that TikTok is an ideal platform for women to unwind, be entertained, learn new information, and gain new solutions without necessarily gratifying their social needs. Additionally, our results suggested that women practised variations of coping orientations

when consuming TikTok to accommodate their needs and desired outcomes when experiencing a stressful experience.

As we previously discussed, women have been consuming TikTok to cope with stress through the variations of coping orientations; however, our results presented that the most practised coping orientation is the problem-solving coping strategy – approach coping strategy. In particular, women turned to TikTok for information and solutions to help them manage their stressful experiences; this comes as no surprise as TikTok has moved towards knowledge dissemination, as evidenced by the hashtag #LearnOnTikTok, which has garnered 656.4 billion views as of August 2, 2023. Users can access various content through this hashtag, including tips-and-tricks, tutorials, demos, challenges, questions and answers, and more (Garcia et al., 2022). During the pandemic, TikTok became especially popular among its young users, and as people depended on the platform for information and educational distribution, content creators have become progressively focused on debunking fake news, manipulated media, and other types of misinformation while subjecting their videos to be more informatively digestible and entertaining for their audience (Newman, 2022; Paoletti, 2022). This supports our results that implicated short-formatted videos accompanied by straightforward messages with a small amount of humour are effective for user engagement and encourage learning experiences, which is also consistent with our findings of participants relying on humour for coping.

Moreover, the consumption of TikTok has also impacted women's emotion-focused coping consequent to its nature of hosting relatability among its users. Since the pandemic, TikTok has become a platform where many users may share similar backgrounds and experiences (Klug et al., 2023), hence, fostering a space for an individual to reflect on each other's personal experiences or opinions through short-formatted videos. Even though our participants do not actively express their thoughts and emotions online, they reported relief when they came across videos related to the said problems. In this regard, women can foster mutual emotional support and motivation via TikTok content related to their stressful experiences; most significantly, exposure to these contents helps them be conscious of the necessities of effective coping and emotion management when experiencing stress. Subsequently, though some women may not wish to engage with anything

related to their stressful experiences; they may cope through other forms of distractions available on TikTok, such as seeking entertainment or comedic content, including calming content such as inspirational, feel-good, and religious-based videos.

Many women in Malaysia turn to TikTok for stress-coping due to the negative stigma surrounding stress and mental health in society - those suffering from excessive stress and its consequences often face discrimination and stigmatisation in various aspects of their lives, such as physical health, social relationships, financial independence, and employment (Hanafiah & Bortel, 2015). Family, friends, and employers commonly perpetrate this mistreatment because of the poor education regarding this topic; additionally, lower-income groups perceive it as a spiritual, rather than health, issue (Radhi, 2022). Hence, when women's daily lives revolve around work, home, and social life, the stigmatisation can instigate perpetual feelings of distrust, hopelessness, rejection, social exclusion, and isolation. Our participants also expressed such sentiments, whereby they admitted to not appreciating the reactions or perceptions that others displayed when they addressed their stress or mental struggles. Apart from that, lower-income women in Malaysia lack the funding to access professional mental health services, resulting in many not seeking help (Radhi, 2022). While the country has gradually progressed by offering helplines for counselling and emotional support, there is still a shortage of psychiatrists and psychologists, causing citizens to endure a long waiting list for treatment (Radhi, 2022). As Hanafiah & Bortel (2015) pointed out, addressing the issue requires years of effort from advocacy and education to combat the stigma surrounding mental health.

CONCLUSION

In sum, this paper has shed light on women's stress and their consumption of TikTok for stress-coping. TikTok is significant in women's stress and emotion management because it allows them to cater to their intrinsic and coping needs accessibly and easily. The platform's short-formatted, algorithm-generated videos provide information and solution, entertainment, and distraction, which enables women to manage and cope with their

everyday stress. This paper also highlights Malaysian women's social and economic realities when seeking professional services for their mental health struggles and how TikTok has become a space for these women to cope. These findings can be utilized to develop further interventions that address the distinctive characteristics of women's stressors. Ultimately, we hope this paper contributes to a better understanding of women's stress in this current era and how social media can be an effective tool for coping. Future research may explore gender differences in stress-coping and consumption practices.

REFERENCE

Braun, V., Clarke, V. (2012). Thematic analysis. In Cooper, H., Camic, M. P., Long, D. L., Panter, A. T., Rindskopf, D., Sher, K. J. (Eds.). APA handbook of research methods in psychology

(Vol. 2). Research design: Quantitative, qualitative, neuropsychological, and biological. Washington: American Psychological Association, pp. 57-71.

Carver, C. S. (2007). Stress, coping, and health. In Friedman, H. S., Silver, R. C. (Eds.). Foundations of health psychology. New York: Oxford University Press, pp. 117-144.

Cohen, S., Janicki-Deverts, D., Miller, G. E. (2007). Psychological Stress and Disease. JAMA, 298(14), pp. 1685-1686.DOI:10.1001/jama.298.14.1685

Costescu, C., Chelba, I., Rosan, A., Kovari, A., Katona, J. (2021). Cognitive Patterns and Coping Mechanisms in the Context of Internet Use Applied Sciences, 11, pp. 1302. DOI:10.3390/app11031302

Garcia, M. B., Juanatas, I. C., Juanatas, R. A. (2022). TikTok as a Knowledge Source for Programming Learners: A New Form of Nanolearning?. 2022 10th International Conference on Information and Education Technology (ICIET). DOI: 10.1109/ICIET55102.2022.9779004

Hampton, K. N., Lee, R., Lu, W. X., Shin, I. Y., Purcell, K. (2014). Social Media and the Cost of Caring. Pew Research Center. United States of America: Washington DC.

Hanafiah, A. N., Bortel, T. N. (2015). A qualitative exploration of the perspectives of mental health professionals on stigma and discrimination of mental illness in Malaysia. International Journal of Mental Health Systems, 9(10). DOI: 10.1186/s13033-015-0002-1

Klug, D., Evans, M., Kaufman, G. (2023). How TikTok served as a platform for young people to share and cope with lived COVID-19 experiences. MedieKultur Journal of Media & Communication Research, 38(73), pp. 152-170. DOI:10.7146/mk.v38i73.128463

Knobloch-Westerwick, S., Hastall, M. R., Rossmann, M. (2009). Coping or Escaping? Effects of Life Dissatisfaction on Selective Exposure. Communication Research, 36(2), pp. 207-228. DOI:10.1177/0093650208330252

Lazarus, R. S., Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer Pub. Co.

Maddi, S. R. (2006). Hardiness: The courage to grow from stresses. The Journal of Positive Psychology, 1(3), pp. 160-168. DOI:10.1080/17439760600619609

Nabi, R. L., Pérez Torres, D., Prestin, A. (2017). Guilty pleasure no more: The relative importance of media use for coping with stress. Journal of Media Psychology, 29, pp. 126-136.

Najmul-Islam, A. K. M. Mäntymäki, M., Laato, S., Turel, O. (2022). Adverse consequences of emotional support seeking through social network sites in coping with stress from a global pandemic. International Journal of Information Management, 62, pp. 1-12. DOI: 10.1016/102431

Newman, N. (2022, December 8). How publishers are learning to create and distribute news on TikTok. Reuters Institute for the Study of Journalism. https://reutersinstitute.politics.ox.ac.uk/how-publishers-are-learning-create-and-distribute-news-tiktok. Accessed 1st Aug 2023.

Paoletti, J. (2022, June 29). TikTok As A Source Of Information For Gen Z (And What It Means For Brands). Forbes. https://www.forbes.com/sites/forbescommunicationscouncil/2022/06/29/tiktok-as-a-source-of-information-for-gen-z-and-what-it-means-for-brands/?sh=3cfabe596b67 Accessed 1st Aug 2023.

Pearlin, L. I. (1989). The Sociological Study of Stress. Journal of Health and Social Behavior, 30(3), pp. 241-256. DOI: 10.2307/2136956

Radhi, N. A. (2022, June 19). Malaysia needs to do a lot more for mental health. News Straits Times. https://www.nst.com.my/news/nation/2022/06/806263/malaysia-needs-do-lot-more mental-health. Accessed 1st Aug 2023.

Revathy, V. R., Aram, I. A., Sharmila, V. S. (2018). Social media as a means to overcome stress and depression among women. Journal of Media and Communication Studies, 10(6), pp. 44-46. DOI: 10.5897/JMCS2018.0605

Selye, H. (1982). History and present status of the stress concept. In Goldberger, L., Breznitz, S. (Eds.). Handbook of stress: Theoretical and clinical aspects. New York: Free Press, pp. 7-17.

Wolfers, L. N., Schneider, F. M. (2021). Using Media for Coping: A Scoping Review. Communication Research, 48(8), pp. 1210-1234. DOI:10.1177/0093650220939778

Mapping the Landscape of e-Learning Research: A Bibliometric Analysis

Norliza Muhamad Yusof[1], Muhamad Luqman Sapini[1,2*], Muhammad Zulqarnain Mohd Nasir[3], Mohd Nur Fitri Mohd Salim[4]

[1]College of Computing, Informatics and Mathematics, Universiti Teknologi MARA Cawangan Negeri Sembilan, Kampus Seremban, 70300 Seremban, Negeri Sembilan, Malaysia
norliza3111@uitm.edu.my
[2]School of Mathematical Sciences, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia
luqman0211@uitm.edu.my
[3]Faculty of Sports Science & Recreation, Universiti Teknologi MARA Cawangan Negeri Sembilan, Kampus Seremban, 70300 Seremban, Negeri Sembilan, Malaysia
zulqarnain9837@uitm.edu.my
[4]Akademi Pengajian Bahasa, Universiti Teknologi MARA Cawangan Negeri Sembilan, Kampus Seremban, 70300 Seremban, Negeri Sembilan, Malaysia
fitrisalim@uitm.edu.my
**Corresponding Author*

Received: 15 November 2024
Accepted: 25 December 2024
Date Published Online: 1 January 2024
Published: 1 January 2024

Abstract: *This research conducts a comprehensive bibliometric analysis of academic publications on e-learning, aiming to gain perspectives on the state of the field, and the emergence of patterns within this field of study. A systematic search was conducted in the Scopus database, yielding 1983 documents related to e-learning. The network analysis focused on keyword distribution, country representation, and co-authorship using VOSViewer software and weighted degree centrality. The keyword analysis revealed "e-learning" as the dominant and central theme, highlighting its significance in the research domain. The emergence of "Covid-19" as a widely used keyword for searches implied that the pandemic affected e-learning activities. Moreover, the representation of institutions from diverse countries showcased the global interest in e-learning research, fostering*

potential cross-cultural collaborations. Additionally, the increasing trend in e-learning research publications over the years indicated the growing importance of digital education. The interdisciplinary nature of e-learning research, spanning Computer Science, Social Sciences, Engineering, and Medicine, underscored the field's diverse perspectives. Furthermore, the Social Network Analysis unveiled collaborative networks of co-cited authors, regions, and keywords, illuminating the interconnectedness within the e-learning research community. The findings contribute to a better understanding of the e-learning research landscape, facilitating informed decision-making for researchers, educators, policymakers, and institutions. Likewise, the analysis provides valuable insights for future research directions, enabling advancements in e-learning practices and fostering innovation in the digital age.

Keywords: *Bibliometric analysis, centrality, e-learning, network analysis, VOSViewer.*

INTRODUCTION

e-Learning refers to the utilization of electronic media and information and communication technologies (ICT) within the field of education. It comprises various components, including online courses, webinars, collaborative learning environments, and digital game-based learning (Silverstru et al., 2018). The occurrence of e-learning has experienced a significant rise in recent years because of improvements in technology (Kimura et al., 2023), evolving societal norms, and the occurrence of crises such as the COVID-19 epidemic (Brika et al., 2021), which required a transition from traditional classroom teaching to online learning platforms (Law et al., 2022). Hence, a growing body of research and literature on e-learning has emerged, creating an opportune environment for conducting bibliometric analysis (Castillo-Velazquez & Silva-Lopez, 2022). Bibliometrics is a statistical analysis of written publications that offer quantitative insights into the patterns of academic literature (Jaradat et al., 2022). These insights, garnered from citation analysis, content categorization, co-citation analysis, and other such techniques, provide valuable information about the prominence of authors, articles, and topics within a field of study (Chen, 2017). In essence, bibliometric analysis serves as a microscope through which we

can view the dissemination and impact of knowledge within a particular academic landscape (Chiroma et al., 2020). E-learning is a rapidly evolving field, with an accelerating pace of development fuelled by technological advancement and societal change (Sweileh, 2021). As a result, the literature on e-learning is vast, diverse, and continually growing (López-Robles et al., 2020). The diversity and complexity of e-learning research make it challenging to draw connections between different works, discern patterns of influence and citation, or gain an overview of the field. Despite these challenges, there has been a lack of comprehensive bibliometric analysis within the e-learning field, particularly in network analysis. Such analysis could provide valuable insights into the structure and trends of e-learning research, offering a clearer picture of the knowledge landscape within this field. Therefore, there is a pressing need for detailed, comprehensive bibliometric studies focusing on e-learning to help scholars, educators, and policymakers better understand and navigate this complex field. This study aims to conduct a comprehensive bibliometric analysis of the literature in the e-learning field, seeking to understand the breadth and depth of scholarly work within this evolving field.

2. DATA ACQUISITION AND QUERY CRITERIA

In this research, we employed a bibliometric analysis approach to examine the research publications published in the e-learning domain. A search was conducted on the specified topic with the Scopus database on July 12, 2023. For this research, we concentrated on e-learning publications published over the past five years and selected them based on their titles, abstracts, and keywords. These were identified using the particular query:
TITLE-ABS-KEY (elearning OR "electronic* learning*") AND (LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019)). Through this search, we came up with a total of 1988 documents. However, there were some duplicates within the data obtained. By removing these identical records, there were 1983 academic documents available for further detail analysis. We extracted relevant results and findings from the documents received, such as the publication year, author, subject area, keywords, affiliation, country/region, and language.

3. BIBLIOMETRIC ANALYSIS TOOLS AND SOCIAL NETWORK ANALYSIS

In the framework of this investigation, the data processing and analysis methods were carried out by utilizing software such as Microsoft Excel 365 and Harzing's Publish or Perish. The data collected from the Scopus database are compiled and examined with Microsoft Excel 365, incorporating the associated figures and tables. The Publish or Perish program developed by Harzing (2007) was employed in retrieving and analyzing citations found in Scopus and Google Scholar. Social Network Analysis (SNA) was used to analyse co-occurrence from a critical perspective. SNA is a comprehensive scientific and theoretical framework employed to examine and analyse the complex networks and interconnections among individuals, organizations, or other entities (Butts, 2008). SNA comprises two fundamental components: Nodes, which represent distinct entities within the network, and Edges, which represent the links or interactions between these entities (Sreejith et al., 2016). The VOSViewer software was utilized to evaluate the co-cited authors, countries, and keywords to visually represent the networks (Van Eck & Waltman, 2010). Centrality is a concept used in SNA to measure the importance of nodes within a network (Sapini et al., 2022). It quantifies the degree to which a node is positioned at the center or core of the network, indicating its influence, control, or access to the information within the social structure (Gopalakrishnan et al., 2020). In this research, Weighted Degree Centrality (WDC) was employed as a method for analyzing the network model. WDC is one of the tools within the framework of Centrality (Candeloro et al., 2016). To calculate the WDC of a node, it is necessary to aggregate the weights of all the edges linked to this node. Nodes with a higher WDC exhibit more robust and significant relationships with other nodes in the network, indicating their heightened impact or centrality within the weighted network.

4. RESULT AND ANALYSIS

This section presents the results and analysis obtained from the bibliometric analysis done. The results and analysis are presented in the form of Tables and Figures as shown and explained according to the following sub-sections.

4.1 YEAR OF PUBLICATIONS

Figure 1 shows an increase in the number of publications related to e-learning from 2019 to 2021, indicating rising interest and research activity on the topic. This pattern coincides with the quickening pace of technological advancement and the growing prevalence of digital resources in educational settings. According to the data, the number of publications in recent years has been relatively high, with 2021 having the most significant count. This shows that e-learning will continue to be a dynamic and busy study topic, with new methods being investigated and continual technological developments. The increased number of publications in recent years may also indicate the growing significance of e-learning, particularly as a response to the shift towards online and blended learning that has occurred worldwide during the COVID-19 epidemic. As of July 2023, the Scopus database had added 185 new articles to its collection in 2023. Consequently, it is anticipated that more additions will follow.

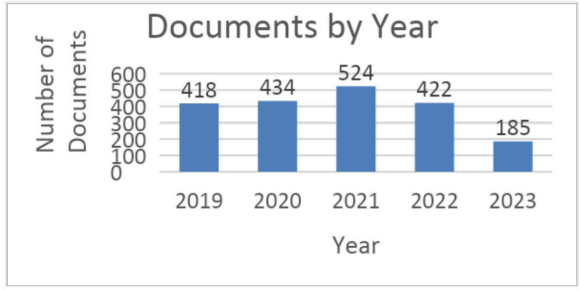


Fig. 1 Yearly publication on e-learning

4.2 LANGUAGE

According to Table 1, a large proportion (more than 90%) of the obtained documents were written in English (99.34%). English dominates the e-learning research landscape with 1928 documents. As the global lingua franca of academic communication, English is the primary language for scholarly publishing and knowledge dissemination. Most of the e-learning research is conducted and published in English, allowing it to reach a broad international audience. Although the use of languages other than English has a percentage of less than one percent, encouraging more publications in these

languages would promote diversity, inclusivity, and cross-cultural exchange of e-learning research. Local researchers can disseminate findings within their linguistic communities while fostering international collaboration.

Table 1. Documents languages

Language	No. of Document	Language	No. of Document	Language	No. of Document
English	1928	Portuguese	5	Arabic	2
Spanish	41	Persian	4	Indonesian	1
Russian	27	Italian	3	French	1
German	20	Chinese	2	Afrikaans	1

4.3 DOCUMENT AND SOURCE TYPE

Articles are the most common document type in e-learning research, with 1109 publications, as shown in Table 2. Articles typically represent original research, empirical studies, theoretical explorations, or case studies. They are the backbone of scholarly communication, presenting new findings and contributing to advancing knowledge in the field. Table 3 displays five types of sources related to the field of e-learning that have been published. Journals are the most common category, with conference proceedings ranked second in distribution. Journals are frequently seen as more reputable than other sources in academic circles. A journal's impact factor is a measure of its significance in the scientific community, and publishing in a high-impact journal can boost a researcher's profile and career. As a result, researchers may be more likely to submit their findings to peer-reviewed journals.

Table 2. Document Type

Document Type	Number of Documents	Document Type	Number of Documents
Article	1109	Note	7
Conference paper	691	Letter	3
Book chapter	96	Editorial	3
Review	66	Short survey	2
Conference review	38	Erratum	1
Book	11	Data paper	1

Table 3. Source Type

Source Type	Journal	Conference proceeding	Book series	Book	Trade journal
Number of Documents	1192	601	159	73	3

4.4 SUBJECT AREA

This research presents documents based on their subject areas, as shown in Figure 2. Computer science has the highest number of publications among the subject areas in the dataset. The dominance of computer science in e-learning publications aligns with technology's significant role in shaping and facilitating e-learning environments. Computer science disciplines such as artificial intelligence, machine learning, human-computer interaction, and data science have increasingly been integrated into e-learning practices, leading to innovative approaches and advancements. Social sciences has the second highest number of publications among the subject areas in the dataset. The dominance of social sciences in e-learning publications signifies the importance of understanding the social and human aspects of e-learning, including learner engagement, motivation, collaboration, cultural influences, and the impact of e-learning on educational outcomes. Other than that, there are a variety of subjects where e-learning can be applied, such as Mathematics, Pure Sciences (Physics, Medicine, Energy), Business and Management, and Engineering.

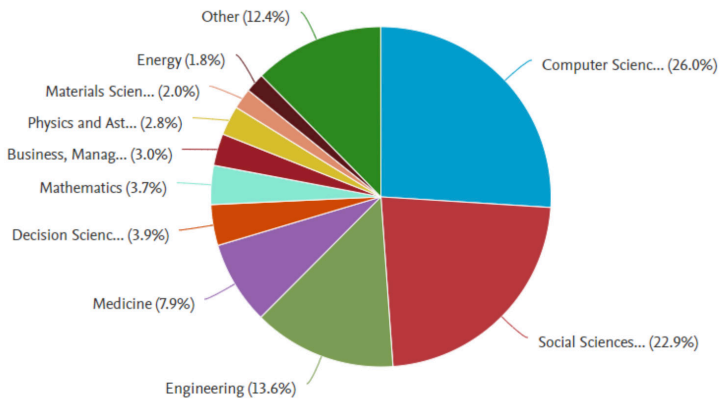


Fig. 2 Subject Area

4.5 KEYWORD ANALYSIS

Table 4 shows the 20 most-used keywords (in frequency) from e-learning publications. The Weighted Degree Centrality (WDC) represents a keyword's total number of co-occurrences with other keywords, indicating the keyword's centrality in the e-learning research network. The most prevalent keyword was "e-learning," which occurred 1560 times and had the highest WDC value of 2425. This demonstrated its central position and extensive connectivity within the research network. Other frequently occurring and influential keywords included "Human" (516 occurrences, WDC: 1621) and "Students" (395 occurrences, WDC: 1214). This indicates that recent studies are focused on understanding the human aspects of e-learning and exploring the students learning experiences. There are several keywords with high frequency and WDC values, including "e-learning," "Human," "Students," "Learning systems," and "Electronic learning." These keywords have a high frequency of occurrence and a high WDC value, indicating a positive correlation. In other words, the most common keywords are also highly central and interconnected throughout the e-learning research network. This positive correlation indicates that the most frequently used keywords in e-learning research are prevalent and significant in connecting the field's various themes and topics. Researchers tend to concentrate on these central keywords, and their work often collides with other e-learning-related research fields.

Table 4. Top 20 keywords in e-learning

Keyword	Occurrence	WDC	Keyword	Occurrence	WDC
e-learning	1560	2425	Learning	153	819
Human	516	1621	Female	121	943
Students	395	1214	Engineering education	120	359
Learning systems	302	836	Male	115	912
Electronic learning	246	686	Medical Education	112	643
Education	232	1089	Online learning	107	279
Teaching	208	1042	Adult	107	835
Covid-19	186	603	Education computing	102	400
Article	174	1167	Pandemic	73	413
Computer-aided instruction	166	484	Curriculum	65	407

VOSViewer, a bibliometric network creation and visualization software program, was used to map and visualize the author's keywords. The network representation of the author's keywords is illustrated in Figure 3. In this visualization, nodes are utilized to represent keywords, while edges

are employed to indicate relationships with other keywords, specifically co-occurrence. Additionally, color is employed to signify the cluster to which each keyword belongs. Clusters consisted of keywords of the same color. The fundamental themes in e-learning research were represented by the green cluster of keywords, which included "e-learning," "teaching," "electronic learning," and others. These keywords have many occurrences and WDC values, showing their importance in the research network. The blue cluster included the keywords "pandemic" and "Covid-19," indicating the importance of the Covid-19 pandemic in e-learning research. The frequency with which "Covid-19" appeared (186 times) emphasized its significance as a driving factor in the e-learning scene. The red cluster included scientific terms like "controlled study" as well as demographic terms like "adult," "female," and "male." These keywords emphasized the various approaches and educational elements incorporated into e-learning research. Overall, the keyword analysis found that core themes in e-learning research include e-learning, teaching, and electronic learning. The Covid-19 epidemic significantly impacted the field, with researchers looking at its implications to e-learning. Additionally, the wide diversity of approaches and demographic factors reflected the broad characteristic of e-learning research.

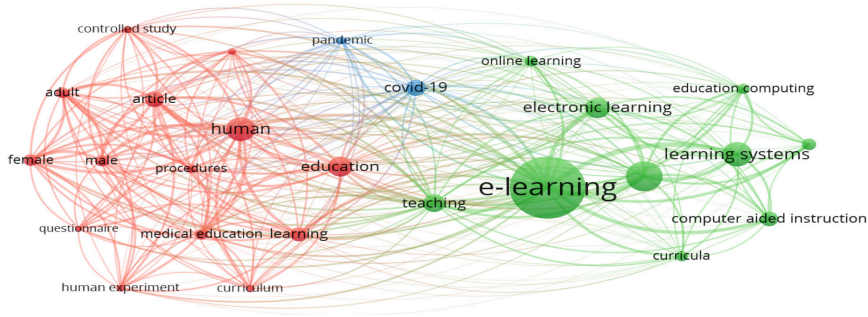


Fig. 3 Keyword co-occurrence network visualization

4.6 COUNTRY DISTRIBUTION

The geographical distribution of scholarly contributions and collaborative patterns among countries play a vital role in shaping the global landscape of e-learning research. The retrieved documents feature contributions from authors originating in 74 different nations. Table 5 lists the top 20 countries

by the number of publications associated with e-learning. The United States emerges as a dominant force in e-learning research, contributing a substantial number of documents (204) and exhibiting a high WDC value of 94, indicating its significant collaborative engagement with other countries. Similarly, countries like Indonesia, India, Spain, the United Kingdom, Saudi Arabia, and Malaysia exhibit notable research outputs, showcasing varying degrees of collaboration with other nations. European countries, including Germany, Romania, Spain, also strongly dominate this research area. Notably, the United Kingdom stands out with a high WDC value of 79, reflecting its robust international collaborations. Several other countries, such as South Africa, China, Iraq, Italy, and Jordan, significantly contribute to e-learning research with moderate to lower levels of collaboration. Meanwhile, countries like Norway, Sweden, and Netherlands demonstrate active engagement with moderate collaboration, enriching the global e-learning research network.

Table 5. Top 20 e-learning research countries

Country/Territory	Documents	WDC	Country/Territory	Documents	WDC
United States	204	94	Canada	68	68
Indonesia	142	15	Romania	64	28
India	126	29	South Africa	64	24
Spain	115	37	China	46	23
United Kingdom	109	79	Iraq	44	13
Germany	92	33	Italy	40	53
Saudi Arabia	87	44	Jordan	40	24
Malaysia	84	48	Iran	36	14
Russian Federation	81	28	Czech Republic	31	17
Australia	79	34	Netherlands	30	36

Figure 4 presents the authors' network visualization map, constructed based on their associations with different countries. The authors' network visualization using VOSViewer highlights three significant clusters of countries with strong collaborative relationships in the e-learning research domain. The blue cluster represents Middle Eastern and Asian countries with substantial collaboration, the green cluster comprises European countries with active cross-border collaborations, and the red cluster includes countries from different continents engaged in extensive international partnerships. These collaborative clusters are consistent with Table 5, which showed specific countries with high numbers of e-learning research documents and significant WDC values, indicating their central roles in the collaborative network. The visualization reinforces the global

interest and engagement in e-learning research, as countries from various regions actively collaborate to advance the field. These collaborative efforts contribute to the diverse perspectives, methodologies, and innovations in e-learning research, enriching the global knowledge base in this domain.

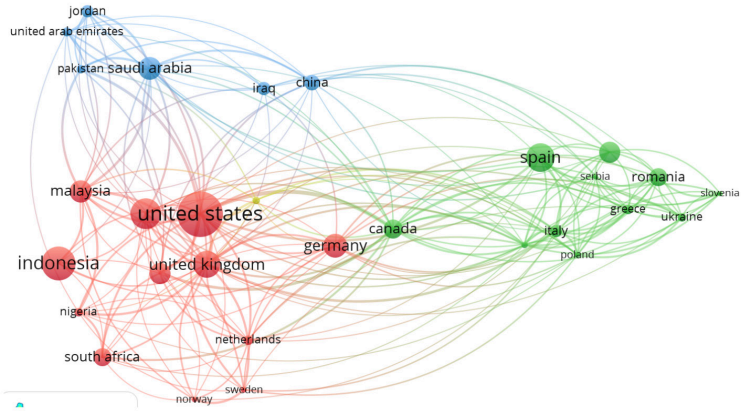


Fig. 4 e-Learning country co-authorship

4.7 AUTHORSHIP ANALYSIS

The analysis of authorship in e-learning research highlights the contributions and impact of individual authors. Table 6 is a compilation of the authors who have demonstrated the highest activity level, as evidenced by their minimum of five publications. Some authors, such as Pikhart, M., García-Peñalvo, F.J., Stuby, L., Suppan, L., and Suppan, M., stand out with their significant research output and high citation counts. Their solid collaborative engagement is also reflected by their relatively high WDC values. These authors have likely played pivotal roles in connecting and advancing research in the e-learning domain.

Table 6. Top 10 leading authors in e-learning research

Name of Author	No. of document	No. of citation	WDC	Name of Author	No. of document	No. of citation	WDC
Pikhart, M.	13	87	7	Klimova, B.	5	17	4
García-Peñalvo, F.J.	11	575	5	Stuby, L.	5	79	14
Ivanova, M.	6	10	0	Suppan, L.	5	79	14
Alonso De Castro, M.G.	5	49	5	Suppan, M.	5	79	14
Ayub, E.	5	10	2	Tick, A.	5	80	0

Next, the co-authorship analysis is carried out with the help of VOSViewer to investigate the authors' collaborative work. This study analyses the collaboration of the authors by conducting the co-authorship analysis using VOSViewer. As shown in Figure 5, the authors' network visualisation map includes 20 authors and 18 clusters, indicating a highly fragmented and specialised research landscape within the e-learning domain. Numerous small clusters, each comprising at most three authors, suggest that the e-learning research community comprises several distinct and tightly-knit research groups with specific research interests. The small size of each cluster indicates that authors within the same cluster are closely connected and likely to collaborate extensively. While the specialized clusters indicate strong collaboration within each group, it may pose challenges for broader collaboration and cross-pollination of ideas across the entire e-learning research landscape. The small size of the clusters might limit the exchange of knowledge and ideas between authors working in different areas of e-learning. Thus, to promote knowledge exchange, interdisciplinary bridges, and a more cohesive research community, efforts can be made to foster collaboration and communication across diverse clusters and encourage the exploration of emerging trends and interdisciplinary intersections.

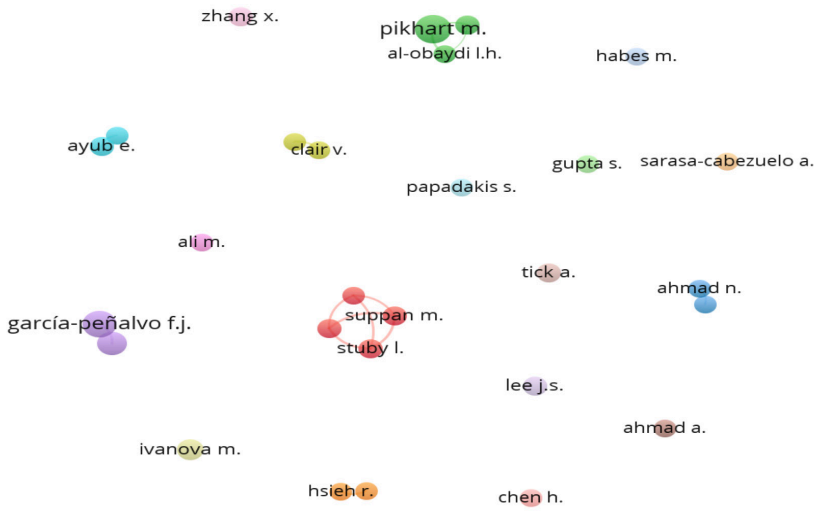


Fig. 5 e-Learning co-authorship network

4.8 CITATION ANALYSIS

Harzing's Publish or Perish software was employed to evaluate citation metrics for the dataset obtained from the Scopus and Google Scholar (GS) databases. The data shown in Table 7 pertains to the number of citations received by each paper and the average number of citations every year. This analysis helps to identify the most influential and widely cited papers in the e-learning domain, giving insights into the impact and relevance of these research works. The high occurrence of the keyword "Covid-19" in the most cited papers implies that researchers have been keenly investigating the implications of the pandemic on educational practices and the rapid adoption of e-learning during this period. The Covid-19 crisis forced educational institutions worldwide to shift from traditional classroom-based teaching to remote and online learning, leading to an increased interest in e-learning research as an alternative and effective mode of education. The presence of two non-Scopus indexed papers among the top ten references indicates that e-learning research is published in diverse publication channels beyond those covered by Scopus. These emphasize the importance of considering multiple databases and sources to ensure comprehensive coverage of relevant literature in e-learning.

Table 7. Top 10 referenced e-learning papers.

No.	Documents	Scopus Cited by	Scopus Cites per year	GS Cited by	GS Cites per year
1	(Almaiah et al., 2020)	483	161	1203	401
2	(Al-Fraihat et al., 2020)	439	146.33	983	327.67
3	(Abbasi et al., 2020)	300	100	803	267.67
4	(Favale et al., 2020)	312	104	742	247.33
5	(Hasan & Bao, 2020)	285	95	706	235.33
6	(Mailizar et al., 2020)	296	98.67	659	219.67
7	(Aboagye et al., 2020)	NA	NA	639	319.5
8	(Alsoufi et al., 2020)	278	92.67	627	209
9	(R.Radha Dr.V.Sathish Kumar, Dr.AR.Saravanakumar, 2020)	NA	NA	627	209
10	(Alqahtani & Rajkhan, 2020)	235	78.33	626	208.67

4.9 MOST ACTIVE SOURCE TITLE

This research additionally provides the title of the most often cited source, referenced in 20 or more e-learning papers (refer to Table 8). The Institute of Electrical and Electronics Engineers (IEEE) is recognized as one of the leading publishers in the e-learning field, making significant contributions to scholarly publications in this domain.

Table 8. Most active source title

Source	No. of document
IEEE Access	48
Elearning And Software For Education Conference	47
ACM International Conference Proceeding Series	43
International Journal Of Emerging Technologies In Learning	43
Journal Of Physics Conference Series	41
Ceur Workshop Proceedings	30
Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics	26
Advances In Intelligent Systems And Computing	25
Lecture Notes In Networks And Systems	23
AIP Conference Proceedings	21
Sustainability Switzerland	21

4.10 MOST ACTIVE INSTITUTION

This study includes a review of institutions' involvement in e-learning research, specifically focusing on those that have produced a minimum of 10 publications. According to the data presented in Table 9, it can be observed that the Universidad de Salamanca has the most significant quantity of publications in the field of e-learning. Institutions from various countries, including Spain, South Africa, the Czech Republic, Indonesia, Romania, Australia, Saudi Arabia, Canada, Malaysia, Morocco, and others, reflect the global representation of e-learning research. Potential regional clusters are identified based on the number of institutions from specific countries. For example, institutions from Indonesia and Malaysia (e.g., Bina Nusantara University, Universitas Negeri Yogyakarta, Universiti Teknologi Malaysia, and Universiti Teknologi MARA) form a cluster of active contributors from Southeast Asia.

Table 9. Most active institutions

Affiliation	Documents	Affiliation	Documents
Universidad de Salamanca, Spain	24	Universiti Teknologi Malaysia, Malaysia	11
University of South Africa, South Africa	23	Université Abdelmalek Essaadi, Morocco	11
Univerzita Hradec Králové, Czech Republic	22	The University of Queensland, Australia	11
Bina Nusantara University, Indonesia	19	Universitas Negeri Yogyakarta, Indonesia	11
University Politehnica of Bucharest, Romania	15	Universiti Teknologi MARA, Malaysia	10
University of Melbourne, Australia	13	University of Toronto, Canada	10
King Khalid University, Saudi Arabia	13	KU Leuven, Belgium	10
King Saud University, Saudi Arabia	12	Universitas Negeri Malang. Indonesia	10
University of Ottawa, Canada	12		

CONCLUSION

The primary objective of this study is to perform an extensive bibliometric analysis of the existing literature in the domain of e-learning. The purpose is to gain a full understanding of the scope and depth of academic research conducted in this dynamic sector. The bibliometric analysis conducted in this research offers valuable insights into the landscape of e-learning research, focusing on keyword distribution, country representation, year of publications, and subject areas.

The increasing trend in e-learning research publications over the years demonstrates the growing importance of digital education in the academic community. This upward trajectory indicates the continuous evolution and expansion of e-learning as a critical area of investigation. The interdisciplinary nature of e-learning research across various subject areas highlights its multifaceted nature, integrating insights from fields such as Computer Science, Social Sciences, Engineering, and Medicine. This interdisciplinarity offers a broader perspective for addressing complex educational challenges and fostering innovative solutions. The global representation of e-learning research, with contributions from diverse countries, reflects the widespread interest and engagement in the field. Such diversity presents opportunities for cross-cultural collaborations, knowledge exchange, and developing contextually relevant e-learning solutions tailored to specific regions. The institutes actively involved in e-learning research make significant contributions which are crucial in pushing the boundaries of knowledge and promoting innovation within the area. These institutions are potential hubs for collaboration and knowledge exchange, driving further advancements in e-learning practices. Using Social Network Analysis to visualize co-cited authors, regions, and keywords contribute to a deeper understanding of the collaborative nature of e-learning research. The analysis of co-occurrence networks reveals clusters of related keywords, authors, and countries, emphasizing the interconnectedness and collaborative efforts within the e-learning research community. The prevalence of the keyword "e-learning" emphasizes its centrality and significance in research. It serves as a unifying term, representing the core theme of digital learning. The emergence of "Covid-19" as a prominent keyword underscores the substantial impact of the pandemic on e-learning, encouraging further exploration of how educational systems adapted to the crisis (Rahim et al., 2023).

In conclusion, the bibliometric analysis provides valuable insights into the current state of e-learning research, highlighting its central themes, global representation, and continuous growth. The findings contribute to a better understanding of the e-learning research landscape, paving the way for future research opportunities and collaborative efforts within the e-learning community. By exploring emerging trends, researchers, educators, policymakers, and institutions can collectively enhance the impact and effectiveness of e-learning, contributing to the transformation of the educational landscape in the digital era.

ACKNOWLEDGEMENTS

This research was supported by the Universiti Teknologi MARA, Cawangan Negeri Sembilan.

REFERENCES

Abbasi, S., Ayoob, T., Malik, A., & Memon, S. I. (2020). Perceptions of students regarding E-learning during Covid-19 at a private medical college. Pakistan Journal of Medical Sciences, 36(COVID19-S4), S57–S61. https://doi.org/10.12669/pjms.36.COVID19-S4.2766

Aboagye, E., Yawson, J. A., & Appiah, K. N. (2020). COVID-19 and E-Learning: the Challenges of Students in Tertiary Institutions. Social Education Research, 2(1), 1–8. https://doi.org/10.37256/ser.212021422

Al-Fraihat, D., Joy, M., Masa'deh, R., & Sinclair, J. (2020). Evaluating E-learning systems success: An empirical study. Computers in Human Behavior, 102, 67–86. https://doi.org/https://doi.org/10.1016/j.chb.2019.08.004

Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. Education and Information Technologies, 25(6), 5261–5280. https://doi.org/10.1007/s10639-020-10219-y

Alqahtani, A. Y., & Rajkhan, A. A. (2020). E-Learning Critical Success Factors during the COVID-19 Pandemic: A Comprehensive Analysis of E-Learning Managerial Perspectives. Education Sciences, 10(9). https://doi.org/10.3390/educsci10090216

Alsoufi, A., Alsuyihili, A., Msherghi, A., Elhadi, A., Atiyah, H., Ashini, A., Ashwieb, A., Ghula, M., Ben Hasan, H., Abudabuos, S., Alameen, H., Abokhdhir, T., Anaiba, M., Nagib, T., Shuwayyah, A., Benothman, R., Arrefae, G., Alkhwayildi, A., Alhadi, A., Elhadi, M. (2020). Impact of the COVID-19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning. PLOS ONE, 15(11), e0242905. https://doi.org/10.1371/journal.pone.0242905

Brika, S. K. M., Chergui, K., Algamdi, A., Musa, A. A., & Zouaghi, R. (2021). E-Learning Research Trends in Higher Education in Light of COVID-19: A Bibliometric Analysis. Frontiers in Psychology, 12, 762819. https://doi.org/10.3389/fpsyg.2021.762819

Butts, C. T. (2008). Social network analysis: A methodological introduction. Asian Journal of Social Psychology, 11(1), 13–41. https://doi.org/10.1111/j.1467-839X.2007.00241.x

Candeloro, L., Savini, L., & Conte, A. (2016). A new weighted degree centrality measure: The application in an animal disease epidemic. PLoS ONE, 11(11), 1–14. https://doi.org/10.1371/journal.pone.0165781

Castillo-Velazquez, J. I., & Silva-Lopez, R. B. (2022). Evolution and Trends in E-Learning Approaches to STEM, Engineering Education and Corporate Learning: A Bibliometric Analysis to 2021. 2022 IEEE ANDESCON: Technology and Innovation for Andean Industry, ANDESCON 2022, 2005, 1–6. https://doi.org/10.1109/ANDESCON56260.2022.9989971

Chen, C. (2017). Science Mapping: A Systematic Review of the Literature. Journal of Data and Information Science, 2(2), 1–40. https://doi.org/doi:10.1515/jdis-2017-0006

Chiroma, H., Ezugwu, A. E., Jauro, F., Al-Garadi, M. A., Abdullahi, I. N., & Shuib, L. (2020). Early survey with bibliometric analysis on machine learning approaches in controlling COVID-19 outbreaks. PeerJ. Computer Science, 6, e313. https://doi.org/10.7717/peerj-cs.313

Favale, T., Soro, F., Trevisan, M., Drago, I., & Mellia, M. (2020). Campus traffic and e-Learning during COVID-19 pandemic. Computer Networks, 176, 107290. https://doi.org/https://doi.org/10.1016/j.comnet.2020.107290

Gopalakrishnan, S., Sridharan, S., & Venkatraman, S. (2020). Centrality Measures in Finding Influential Nodes for the Big-Data Network BT - Handbook of Smart Materials, Technologies, and Devices: Applications of Industry 4.0 (C. M. Hussain & P. Di Sia (eds.); pp. 1–17). Springer International Publishing. https://doi.org/10.1007/978-3-030-58675-1_103-1

Harzing, A. W. (2007). Publish or Perish. https://harzing.com/resources/publish-or-perish

Hasan, N., & Bao, Y. (2020). Impact of "e-Learning crack-up" perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss". Children and Youth Services Review, 118, 105355. https://doi.org/10.1016/j.childyouth.2020.105355

Jaradat, Y., Alia, M., Masoud, M., Manasrah, A., Jebreil, I., Garaibeh, A., & Al-Arasi, S. (2022). A bibliometric analysis of the International Journal of Advances in Soft Computing and its Applications: Research influence and Contributions. International Journal of Advances in Soft Computing and Its Applications, 14(2), 167–184. https://doi.org/10.15849/IJASCA.220720.12

Kimura, R., Matsunaga, M., Barroga, E., & Hayashi, N. (2023). Asynchronous e-learning with technology-enabled and enhanced training for continuing education of nurses: a scoping review. BMC Medical Education, 23(1), 505. https://doi.org/10.1186/s12909-023-04477-w

Law, V. T. S., Yee, H. H. L., Ng, T. K. C., & Fong, B. Y. F. (2022). Transition from Traditional to Online Learning in Hong Kong Tertiary Educational Institutions During COVID-19 Pandemic. Technology, Knowledge and Learning, 28(3), 1425–1441. https://doi.org/10.1007/s10758-022-09603-z

López-Robles, J. R., Casas-Valadez, M. A., Guzmán-Fernández, A., Monjaraz-Frausto, C., Castorena-Robles, A., & Gamboa-Rosales, N. K. (2020). Understanding the relationship between e-learning and web 2.0: A bibliometric and thematic analysis from 2006 to 2020. Proceedings of the International Conference on E-Learning, ICEL, 2020-Decem, 290–295. https://doi.org/10.1109/econf51404.2020.9385510

Mailizar, Almanthari, A., Maulina, S., & Bruce, S. (2020). Secondary school mathematics teachers' views on e-learning implementation barriers during the COVID-19 pandemic: The case of Indonesia. Eurasia Journal of Mathematics, Science and Technology Education, 16(7). https://doi.org/10.29333/EJMSTE/8240

R.Radha Dr.V.Sathish Kumar, Dr.AR.Saravanakumar, K. M. (2020). E-Learning during Lockdown of Covid-19 Pandemic: A Global Perspective. International Journal of Control and Automation, 13(4 SE-Articles), 1088–1099. http://sersc.org/journals/index.php/IJCA/article/view/26035

Rahim, N. Z. A., Bahari, N. N., Azzimi, N. S. M., Zamzuri, Z. H., Bahaludin, H., Mohammad, N. F., & Razak, F. A. (2023). Comparing Friends and Peer Tutors Amidst COVID-19 Using Social Network Analysis. Mathematics, 11(4), 1–17. https://doi.org/10.3390/math11041053

Sapini, M. L., Noorani, M. S. M., Razak, F. A., Alias, M. A., & Yusof, N. M. (2022). Understanding Published Literatures on Persistent Homology using Social Network Analysis. Malaysian Journal of Fundamental and Applied Sciences, 18(4), 413–429. https://doi.org/10.11113/mjfas.v18n4.2418

Silverstru, C. I., Ion, V., Botez (Costatin), C., & Icociu, V.-C. (2018). ISCED Classification Influence on E-Learning Education Systems. Informatica Economica, 22(4/2018), 80–88. https://doi.org/10.12948/issn14531305/22.4.2018.07

Sreejith, R. P., Mohanraj, K., Jost, J., Saucan, E., & Samal, A. (2016). Forman curvature for complex networks. Journal of Statistical Mechanics: Theory and Experiment, 2016(6), 1–18. https://doi.org/10.1088/1742-5468/2016/06/063206

Sweileh, W. M. (2021). Global Research Activity on E-Learning in Health Sciences Education: a Bibliometric Analysis. Medical Science Educator, 31(2), 765–775. https://doi.org/10.1007/s40670-021-01254-6

Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics, 84(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3

The Effectiveness of Monolingual Teaching on Students' English Listening Ability

Ruan Xinbei1, Wardatul Akman Din[2]
[1]*Faculty of Psychology and Education, Universiti Malaysia Sabah;*
Fuyang Normal University
Jalan UMS, 88400 Kota Kinabalu, Sabah, Malaysia
287269283@qq.com
[2]*Center for Internationalisation and Global Engagement,*
Universiti Malaysia Sabah
Jalan UMS, 88400 Kota Kinabalu, Sabah, Malaysia
wardadin@ums.edu.my
**Corresponding Author*

Received: 15 November 2024
Accepted: 25 December 2024
Date Published Online: 1 January 2024
Published: 1 January 2024

Abstract: *Nowadays in China, the English proficiency of non-English majors in universities and colleges, in general, is not as satisfactory as expected. One of the reasons is supposed to be the sharp decrease of English input during classroom time, compared with that in junior and senior high school. The research investigates whether monolingual teaching is a possible answer to the problem and the role of the monolingual classroom in improving students' listening performance. The research is quantitative in nature. It adopts a quasi-experimental design, with two classes of freshmen as participants, one being the experimental group, receiving monolingual teaching while the other is the control group, which receives traditional bilingual teaching. In each class, there are 40 students. Before and after the implementation of 15 weeks' monolingual teaching, all the students have to take the pretest and posttest respectively. Besides, all the students have to take The Self-assessment Scales in China's Standards of English Language Ability before and after the implementation of monolingual teaching to see whether they themselves consider their listening ability as having improved. Together with the interview on some students, the research finds that students' listening performance in the experimental group does have a statistically significant improvement, compared with the control group and that L2 can help to change the class atmosphere and inspire*

students to learn English. The research serves as an empirical evidence for the effectiveness of monolingual teaching on students' listening ability, as well as an indication for the direction in how to help the reform of foreign language teaching, especially English teaching in universities and colleges in China in the future.

Keywords: *Bilingual teaching, Listening Ability, Monolingual Teaching*

INTRODUCTION

In China, English has always received great attention due to the increasing importance of English as the globally accepted language and the increasing participation of China in various activities in the world. In August 1978, the Chinese Foreign Language Education Symposium was held in Beijing. In the symposium, it was put forward that "Enhancing foreign language education is an important component to improve the level of science and culture of the whole Chinese nation. High-level foreign language education is one of the prerequisites of an advanced nation as well as an advanced people. Therefore, it is a long-term strategic plan to do well in foreign language education." As a result, students are burdened with high hope to be equipped with high English proficiency.

Currently in China, English is usually taught from the third grade in primary school, about 2 to 4 periods every week with each period lasting for 40 to 45 minutes on average, the position of which is secondary only to Chinese and Mathematics, both of which play a predominant role in primary school. As students enter junior high school, the span for English witnesses a soaring increase as 1 to 2 periods every day on average will be spent on English with each period lasting for 40 to 45 minutes. After that, the time spent on English in senior high school will be significantly more, about 1.5 to 3 periods with each period lasting for the same amount of time every day. In both junior and senior high schools, English is seen to acquire the same central position as both Chinese and Mathematics. In the senior high school entrance examinations in many provinces in China, English has the same total scores of 150 points with Chinese and Mathematics. The same is true for the National College Entrance Examinations, which is considered as the most important examination in China.

However, after students get into universities and colleges, the class time for English witnesses a sharp decrease, which may also vary from two periods per week to four periods per week, with each period equaling to 40 to 45 minutes. Although also a required course, the English course receives much less attention than the major courses from both students and teachers. Even as time goes by, from the third year, English may not be taught any more, whether as a required course or an optional course. Those who have eagerness to study English or the need to pass some English test can mostly rely on self-learning.

1.1 PROBLEM STATEMENT

Due to the sharp decrease of class time and much less attention to English, the English proficiency of Chinese university students is far from satisfactory. According to the China's Standards of English Language Ability (CSE), college students should be able to reach CSE-5 or even CSE-6. The result of a recent questionnaire showed otherwise. The questionnaire was designed to allow the students to test their own English proficiency according to The Self-assessment Scales in China's Standards of English Language Ability, which provides detailed descriptions in the nine levels in eight aspects, with level-1 being the lowest and level-9 the highest. 201 freshmen answered the questionnaire and they were asked to choose the level which description(s) they think match their own situations best. The results showed that in six aspects (i.e. organizational competence, listening comprehension, reading comprehension, oral expression, written expression, and pragmatic ability), only less than 20% of the freshmen assume that they have reached level-5 or beyond. Listening comprehension seems to be the worst part, according to the questionnaire results.

What's more, in an interview, more than 70% of the students answered that the part they fear most in English tests is the listening test. The reasons vary, including that they cannot understand what the speaker(s) is\are saying, that they cannot catch up with the speaker(s) pace, and so on. So, it can be found out that many, if not most of the university students, have not acquired the satisfactory English proficiency as expected, especially in listening ability.

1.2 RESEARCH OBJECTIVES

The study, as stated in the title, aims to explore the effectiveness of monolingual teaching in improving students' L2 proficiency. To be more specific, the study, in current situation of English teaching in China's higher education, is going to dig deep into the problem, and possibly answer the question as to whether converting the traditional bilingual classroom into monolingual classroom, will facilitate or a hinder improvement in students' listening performance.

1.3 RESEARCH QUESTIONS AND RESEARCH HYPOTHESIS

The research question is listed as follows: Does the implementation of monolingual classroom improve students' listening ability in English as L2, compared to bilingual classroom?

Based on the above research question, a research hypothesis is proposed as follows: Monolingual classroom in College English teaching plays a statistically significant role in improving the performance in listening in CET-4.

1.4 SIGNIFICANCE OF THE STUDY

The study is significant in that it will help to define the role of L2 in students' L2 performance, a much-focused and hot-debated issue in China, and even around the globe. It may present as a good piece of advice on how to reform the current English teaching in universities and colleges in China, especially since the country has been trying hard to look for better ways to produce more qualified graduates, with English as L2 proficiency being one of their characteristics. A more suitable curriculum may be reconsidered and redesigned if more of such research could be conducted.

All in all, this study can at least assist in exploring one of the possible ways for addressing the problems and difficulties existing in the current teaching pedagogy. It may not present an absolute solution to these problems, but it may reveal one of the possible answers.

1.5 LITERATURE REVIEW

1.5.1 TEACHING ENCOURAGING THE USE OF L1

The debate over monolingual teaching and bilingual teaching has had a long history, thus giving rise to different teaching theories, principles and methods concerning whether and how to use L1 in foreign language teaching and learning. Some instructors and students prefer only or maximum use of L2 in the classroom context, while some others insist that students' L1 share an important, if not prominent, role in teaching and learning English. Yet, some others even advocate the maximum use of L1, although this has long been frowned upon.

Historically, the grammar-translation method, is perhaps one of the oldest teaching methods- it once occupied certain parts in foreign language learning. In this method, L1 was commonly used in order to make abstract grammar rules more specific and easier to understand. Another similar example is community language learning, which also relied heavily on translation between L1 and L2, not focusing on mechanical translation but a comfortable and secure learning atmosphere.

However, history has proven that the only or maximum use of L1 in classroom context would do little, if any, good to the improvement of students' L2, which is also the reason why such teaching methods have now been despised and out of favor for long and gradually given way to other teaching ways advocating more use of L2. But it does not mean that the use of L1 is no good at all in the process of teaching and learning L2. Quite to the opposite, L1 may still play a certain role in language lessons because teachers may adopt their L1 consciously or unconsciously. A study by Cummins (1981) showed that monolingual instruction allows for more in-depth understanding and cognitive development, particularly in complex subjects like mathematics and science. Another study by Lindholm-Leary (2001) revealed that students who received instruction predominantly in English (L1) in a bilingual program had higher scores on standardized tests compared to students who were taught bilingually. The reasons for this may lie in that L1 is easy for students to understand and easy for

the teacher to adopt explaining such things as grammar items. Additionally, using L1 in foreign language teaching can effectively ease the nervousness and lower the affective filter, as in Krashen's input hypothesis, so that students can learn in a friendly and comfortable environment, as proposed in community language learning.

1.5.2 TEACHING ENCOURAGING THE USE OF L2

Contrary to what has been mentioned above, there also exists many scholars and teachers advocating learning L2 through L2. Such teaching methods include direct method, immersion method, natural method and so on.

The teaching methods have withstood the test of time and proven useful and productive to some degree, although still with some deficits. However, it has been agreed that L2 input is of vital use and significance in teaching and learning L2. Since the classroom may be the only or major environment from which students have the access to L2, as is the case around the globe, especially in most places all over China, the class time spent in putting in L2 does count much, thus giving rise to the many scholars and teaching practitioners who hold the opinion that the more students are exposed to L2, the more quickly and easily they will learn the language. (Kim & Elder, 2008; Ruiz-Funes, 2002; Crichton, 2009) And L2 owns its role in teaching and learning the language itself.

What's more, Hu (2010) focused on the listening and speaking part in English teaching in a Chinese university and analyzed the current situation that college students in China are now consciously learning. However, a lack of subconscious or unconscious acquisition due to the lack of a natural environment for acquisition, results in the creation of a large number of students who can get high scores in examinations but with relatively low application abilities. Therefore, Hu (2010) put forward some new teaching methods for listening and speaking courses, one of them being creating an all-English environment in class to keep students immersed in L2 and to encourage enough output to

help improve students' L2 proficiency. Such findings are shared by Xie (2001) and Hu (2008), all of whom encourage to increase the input of L2 and also emphasize that the input of L2 should be interesting to attract students' attention, and of high quality to improve students' L2 abilities.

There indeed exists some disadvantages of the only use of L2 in the classroom, as agreed by some of the scholars. For example, some think that it may produce a high filter affective in some of the students, which may lead to lower efficiency and less desirable effects in improving students' L2 level. Some others hold that it may waste more time since teachers may spend more time on some activities, such as explaining some abstract linguistic concepts. But, the advantages of the maximum input of L2 should never be underestimated and ignored.

1.5.3 SUMMARY

The debate over the use of L1 and L2 in teaching and learning L2 has never ceased. Whichever side one is on, there are a lot of arguments, experiments and evidence in both theory and practice which will be of great support. Reviewed from a diachronic perspective, the benefits of the use of L2 outweigh those of L1, based on the previous studies. Therefore, it is worth trying to implement a monolingual classroom with all input of English as L2 to explore the effectiveness of monolingual teaching in the context of English teaching and learning in higher education in China.

2. METHODOLOGY

This part deals with the methods and design of the research. The research is designed to compare participants' performance in pretest and posttest, and, with the assistance of SPSS, to determine whether there is statistically significant improvement in participants' performance in listening tests, after the monolingual classroom has been implemented, thus determining the role of monolingual teaching plays in improving students' listening ability.

2.1 PARTICIPANTS

The research is conducted among students in their first year in a Chinese university. In the research, two intact non-English major classes, with 40 students in each class, are chosen, one being the experimental group (EG) and the other one, the control group (CG). In both classes, there are both male and female students, aged between 17 to 19 and both genders are evenly allocated in the two classes. All the participants adopt Chinese as L1 and English as L2. Before entering the university, all the students have received at least 6 years of formal English education in both junior and senior high school.

The two classes are taught by the same teacher, using the same teaching plan and the same teaching materials, thus guaranteeing that the teaching content are the same in both experiment group and control group and that the teacher influence can be reduced to a minimum level. According to the teaching plan, the previous four units in the same textbook are covered. The teacher, being a native speaker of Chinese, has 10 years of College English teaching experience and has obtained 7.5 points in an IELTS (Academic), which is a well-grounded proof of her English proficiency.

In the research, the control group received traditional bilingual teaching (i.e. teachers and students in the classroom teaching and learning shared and used both their L1, Chinese, and L2, English), and the experimental group, monolingual teaching. on the other hand. The whole research will lasted around 15 weeks, 4 periods in each week, with 45 minutes in each period, which amounts to 2,700 minutes in total.

2.2 INSTRUMENTATION

2.2.1 PRETEST AND POSTTEST

In order to ensure the authenticity of the test, the research adopts the listening test in CET-4 (College English Test - Band 4) as its pretest and posttest. CET-4, planned in 1986 and implemented in 1987, is a national examination governed by the Department of

Higher Education, the Ministry of Education of China. It is seen as the most important, the most widely taken, and the most official English examination in universities and colleges in China. It can reasonably be concluded that in China, CET-4 has been regarded as a yardstick for measuring a university student's English proficiency. The listening test in CET-4 includes three parts: News broadcast, long conversations and short passages. The listening test from the most recent CET-4 was chosen as pretest and posttest respectively in the research. The timing and detailed description are shown in the following table.

Table 1. The timing and detailed description of listening test

Parts	Detailed description	Time	Score
News broadcast	Three news items and 7 multiple choices, with 2 or 3 after each news.	About 25-30 minutes	1%*7=7%[1]
Long conversations	Two conversations and 8 multiple choices, with 4 after each conversation.		1%*8=8%
Passages	Three passages and 10 multiple choices, with 3 or 4 after each passage.		2%*10=20%

2.2.2 THE CHINA'S STANDARDS OF ENGLISH LANGUAGE ABILITY (CSE)

The China's Standards of English Language Ability (CSE), was released by The National Language Commission, Ministry of Education of the People's Republic of China on February 12th, 2018 and implemented on June 1st, 2018. It describes an English user's English proficiency into 3 stages, including 9 levels, from eight aspects.

According to the CSE, college students should be able to reach CSE-5 or even CSE-6. So, participants have to take The Self-assessment Scales of CSE in the beginning and at the end of the research for all the students to gauge their own listening ability.

2.2.3 INTERVIEWS

Ten of the participants, 5 males and 5 females, in the experimental group were chosen at random to take the interviews, which is in the form of open questions. The interview was taken at the end of the research, and investigated amongst others, about the interviewees' feelings and opinions on the monolingual classroom to see whether there are any changes before and after the implementation of the monolingual classroom.

2.3 DATA COLLECTION AND DATA ANALYSIS

In the beginning of the research, the pretest means of both experimental and control groups in each major will be checked in paired samples t-test to make sure that there is no significant difference between the English proficiency of the participants in both groups. All the scores of participants in both groups in the posttest are collected and had been run through a paired samples t-test. This is to compare the scores of the experiment and control groups of the research so as to determine whether or not the intervention has had any considerable effect on the experiment group. The statistical analysis above is the main focus of the research.

Besides, the results from the students' answers to The Self-assessment Scales of CSE, together with those from interviews, are adopted to see whether the students themselves consider there is any improvement in their listening ability and for helping to ascertain the significance of monolingual classrooms in enhancing students' listening ability.

3. RESULTS AND DISCUSSION

The following tables show the students' performance in both groups in the pretest and posttest.

Table 2. Descriptive Statistics

	Mean	N	Std. Deviation	Std. Error Mean
CG-pretest	114.18	40	14.856	2.349
EG-pretest	110.83	40	11.277	1.783
CG-posttest	107.90	40	12.072	1.909
EG-posttest	131.98	40	20.569	3.252

Table 3. Paired Sample T-test in CG and EG in pretest

Paired Differences								
CG - EG	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
	3.335	21.672	3.427	-3.581	10.281	.978	39	.334

Table 4. Paired Sample T-test in CG and EG in posttest

Paired Differences								
CG - EG	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
	-24.075	21.654	3.424	-31.000	-17.150	-7.032	39	<.001

Table 5. Paired Sample T-test in CG between pretest and posttest

Paired Differences								
pretest-posttest	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
	6.275	20.129	3.183	-.163	12.713	1.972	39	.056

Table 6. Paired Sample T-test in EG between pretest and posttest

Paired Differences								
pretest-posttest	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
	-21.150	23.804	3.764	-28.763	13.537	-5.619	39	<.001

Table 7. The Results of T*he Self-assessment Scales of CSE*

	Below CSE-5	CSE-5/CSE-6	Higher than CSE-6
CG-pretest	27	13	0
CG-posttest	26	14	0
EG-pretest	26	14	0
EG-posttest	18	20	2

From the above tables, several findings can be easily concluded.

1. In Table 3, the sig.=.334>.05, indicating that the students' performance in listening comprehension in the pretest had no statistical difference between the two groups.
2. After the intervention of monolingual teaching, it can be seen that the mean of CG did not increase but decreased from 114.18 to 107.90, about 6 points lower. On the contrary, the mean of EG increased from 110.83 to 131.98, an increase of about 21 points. In Table 4, sig.<.001<.05. : this shows that the performance of students in EG in listening comprehension had a statistical improvement, compared with CG.
3. In Table 5, the sig.=.056>.05, which means that CG students' performance in listening comprehension had no statistical difference between pretest and posttest.
4. In Table 6, the sig.<.001<.05, which means that EG students' performance in listening comprehension had a statistical improvement between pretest and posttest.
5. The EG students also consider that their own listening ability has improvement. In Table 7, before the pretest, the numbers of the students in both groups who think they have reached CSE-5 or CSE-6 are almost the same. After monolingual teaching, the number in the EG increases from 14 to 20 while that in CG stays nearly the same. Moreover, there are even 2 students in the EG who think they have reached CSE-7. So, from the students' perspective, monolingual teaching does indeed facilitate in their listening ability.

The results of the study demonstrate that after the implementation of monolingual teaching, students' performance in listening comprehension does show a statistical improvement, which proves that the increase of L2 input would significantly facilitate teaching and learning L2, at least in listening. The findings coincide with the opinions of many experts and scholars, such as Krashen (1982), who put forward in his input hypothesis, the focus of teaching and learning L2 should not be the explicit grammatical structures or learning activities, but rather on occupying classroom time with acquisition tasks or activities. According to his hypothesis, a learner must be exposed to enough comprehensible input before he reaches the level i+1, with level i standing for the learner's current L2 level. In his opinion, when they receive second language input that is one step beyond

their current stage of linguistic competence, acquirers will improve and make progress. If acquirers understand the input, and there is enough of it, "i+1" will be provided. Numerous studies have shown a positive correlation between comprehensible input and language acquisition. For example, a study by Swain and Lapkin (1995) found that immersion students who received comprehensible input showed higher language proficiency levels compared to those who did not. Although in agreement with the importance of input, some scholars claim that SLA is not achieved merely through comprehensible input. Other types of language input such as incomprehensible input, comprehended input, and comprehensible output are also considered to improve language learning through providing the necessary input. (Bahrani et al. 2014) Students' answers to the interview have also proven that. In the interview, almost all the students said that when the teacher used English only in the classroom, they had to focus really hard to understand what the teacher was saying, which did help to improve their listening comprehension. On the contrary, students receiving traditional bilingual teaching claimed that they still studied as always, and did not pay more attention to what the teacher was talking about than before. What is interesting to note is that 7 students interviewed said that at first, they found it hard to catch up with the teacher. But several classes later after they have gotten used to monolingual teaching, they gradually found that they could understand more, and later, even more, which greatly enhanced their confidence in their English ability, thus triggering more interest in English. At the end of the study, they even looked forward to English class, which has never occurred before, in their own words, "I have never imagined that I would long for an English class, but it did happen!". Another 5 students said that monolingual teaching appeared 'fresh' to them since they have never had any class presented completely in English, which greatly attracted them to the lessons.

CONCLUSION

This study focuses on the effectiveness of monolingual teaching, in which English serves as L2, on students' listening ability in higher education in China. Taking into consideration the important role input plays in teaching and learning L2, the study is of great significance.

First of all, the study reveals that monolingual teaching can effectively increase L2 input, which is of great help in improving students' listening ability. Therefore, the implementation of monolingual classroom should at least be an option in further reform for English teaching, at least for students in higher education in China.

Furthermore, the study also indicates that using L2 can change the classroom atmosphere to a great degree, and it helps to break down the traditional teacher-student barriers. L2 can be a real communicative tool in such a classroom. As Seligson (1997: P.22) said, "By using English most or all of the time in class, you give students vital listening practise, and the opportunity to respond naturally to spoken English."

To sum up, increasing the L2 input plays a major role in college English teaching since it directly affects students' English proficiency. As a result, teachers should try to put in as much English as possible in their classroom in order to improve students' English ability, at least in listening, as well as drawing students' interest and attention to learn English, as the study proves. The debate over whether L1 or L2 should be adopted in teaching and learning L2 may never cease, but it always pays off to have more L2 input for students. How can one expect to manage a certain language without being exposed to the language itself, after all?

REFERENCES

Bahrani, T. et. al. 2014. Second Language Acquisition in Informal Setting. Theory and Practice in Language Studies, 4, 1714 - 1723.

Crichton, H. 2009. "Value added" modern languages teaching in the classroom. An investigation into how teachers' use of classroom target language can aid pupils' communication skills. Language Learning Journal, 37(1), 19-34.

Cummins, J. 1981. The role of primary language development in promoting educational success for language minority students. In California State Department of Education (Ed.), Schooling and language minority students: A theoretical framework. Los Angeles: Evaluation, Dissemination and Assessment Center, California State University, 3-49.

Hu Baicui. 2010. The Implication of SLA Theories on the Reform of the Teaching in Listening and Speaking of College English. Journal of Liaoning Educational Administration Institute, 27(7), 66-67.

Hu Xiaoli. 2008. The Implication of Two of Krashen's Hypothesis on the Teaching of College English. Science and Technology Information, 30, 61-62.

Kim, S. H. O. & Elder, C. 2008.Target language Use in foreign language classroom: Practices and perceptions of two native speaker teachers in New Zealand. Language, Culture and Curriculum, 21(2), 167-185.

Krashen, S. D. 1982. Principles and Practice in Second Language Acquisition. Peragamon Press Inc.

Lindholm-Leary, K. 2001. Dual Langua Education. Clevedon, England: Multilingual Matters.

Swain, M. & Lapkin, M. 1995. Problems in Output and the Cognitive Processes They Generate: A Step towards Second Language Learning. Applied Linguistics, 16(3), 371-391.

Macaro, E. 2001. Analysing Student Teachers' Code-switching in Foreign Language Classrooms. Theories and Decision Making. The Modern Language Journal, 85(4), 531-548.

Nation, P. 2003. The Role of the First Language in Foreign Learning. Asian EFL Journal, 5(2), 1-8.

Ruiz-funes, M. T. 2002. On Teaching Foreign Languages: Linking theory to practice. Westport: Bergin & Garvey.

Seligson, P. 1997. Helping Students to Speak. Spain: Richmond Publishing.

Storch, N. & Wigglesworth, G. 2003. Is There a Role for the Use of the L1 in an L2 Setting? . TESOL Quarterly, 37(4), 760-770.

Xie Dongmei. 2001. The Implication of SLA Theories on the Teaching of College English. Journal of Yulin Normal College, 4, 114-115.

The Evolution, Challenges and Prospects of Implementing Massive Open Online Courses (MOOCs) in Malaysian Public Universities

Ibhrahim Zakaria[1*], Norazlan Anual[2], Zatul Himmah Abdul Karim[3]
Intan Nurul 'Ain Mohd Firdaus Kozako[4], Muhammad Nasrullah Zamri[5]
[1]Faculty of Business and Management, Universiti Teknologi MARA,
Puncak Alam Campus, 42300 Puncak Alam, Selangor, Malaysia
ibhrah2939@uitm.edu.my
[2, 3]Faculty of Business and Management, Universiti Teknologi MARA,
Malacca City Campus, 75350 Central Malacca, Malacca, Malaysia
azlananual@uitm.edu.my, zatul446@uitm.edu.my
[4]Faculty of Business and Management, Universiti Teknologi MARA,
Machang Campus, 18500 Machang, Kelantan, Malaysia
intan866@uitm.edu.my
[5]Department of Management and Accounting, Kolej Poly-Tech MARA,
Alor Setar, 05150, Kedah, Malaysia
nasrullah@gapps.kptm.edu.my
**Corresponding Author*

Received: 15 November 2024
Accepted: 25 December 2024
Date Published Online: 1 January 2024
Published: 1 January 2024

Abstract: *Massive Open Online Courses (MOOCs) have emerged as a promising educational innovation, aiming to democratize access to quality education on a global scale. In the context of Malaysian public universities, MOOCs have garnered significant interest in enhancing educational outreach, improving learning outcomes, and fostering lifelong learning opportunities. However, the implementation of MOOCs in this setting faces several challenges that impact their effectiveness and long-term sustainability. This review was written based on a careful analysis of the published MOOC literature (2008-2023) identified through journals, database searches, searching the Web, and chaining from known sources to form the base for this review. The review intends to understand how the evolution of MOOCs affects the prospects of MOOCs and how universities incorporate MOOCs into their educational frameworks. In addition, this paper aims to explore the current and anticipated future*

challenges that hinder the successful integration of MOOCs especially in public universities across Malaysia. The key challenges identified in the present implementation include limited faculty buy-in and engagement, lack of appropriate technological infrastructure, concerns over course quality and accreditation, and difficulties in assessing and recognizing learners' achievements. Additionally, issues related to cultural barriers and language diversity within the Malaysian context are also found to influence the effective utilization of MOOCs. Looking into the future, this paper will also explore additional potential challenges that may arise in the continued implementation of MOOCs in public universities in Malaysia. Anticipated challenges include evolving pedagogical practices, ensuring equitable access for all learners, addressing the digital divide, and keeping pace with rapidly advancing technology. By shedding light on the current and future challenges faced by public universities in Malaysia in implementing MOOCs, this research aims to provide valuable insights for policymakers, administrators, and educators to enhance the efficacy of MOOCs and leverage their potential for advancing education in the country. Recommendations stemming from this research may include faculty training and development, investment in technological infrastructure, fostering collaborations with private sectors, and designing inclusive and culturally sensitive learning environments. Ultimately, understanding and addressing these challenges are crucial to ensuring the successful integration of MOOCs within the Malaysian higher education landscape, contributing to the nation's efforts to provide accessible, high-quality education to a diverse and aspiring population.

Keywords: *MOOCs, Educational, Innovation, Prospects, Challenges*

INTRODUCTION

Massive open online courses (MOOCs) are among recent additions to the range of online learning options introduced in 2008. It was first introduced at University of Manitoba, a public university in Canada. MOOCs are structured learning interventions delivered via the web, and they enable anyone to participate free of charge (mostly) without having to meet any

demographic or knowledge requirements. To date, MOOCs have been run by a variety of public and elite universities all around the globe. It emerged as a popular mode of learning in 2012, when that year is called as the Year of the MOOC (David, 2012). More than 900 academic institutions have launched MOOCs, and more than 100 million students have signed up for at least one of them (Shah & Pickard, 2019). MOOCs are educational opportunities that permit learners worldwide to participate in a single learning experience on a common platform, such as Coursera, FutureLearn, and edX (e.g., Bonk et al., 2015, 2018; Stracke, 2017; Stracke et al., 2023; Zhang et al., 2020; Diordieva & Bonk, 2023). MOOCs have been envisioned to increase access to education and help to democratize it. Compared to closed online courses, MOOCs generally have more diverse participants in terms of their backgrounds, ages, cultures, identities, readiness, and language proficiencies (Jasnani, 2013; Lu et al., 2020; Diordieva & Bonk, 2023). While MOOCs are generally considered a valuable format for online learning (Gonzalez & Alarcon, 2017), their effectiveness is still a matter of debate. There is no consensus on what success looks like in a MOOC (Rodriquez et al., 2016). Therefore, this paper intends to understand the evolution and prospects of MOOCs, and how public universities incorporating MOOCs into their educational frameworks. It also aimed to explore the current and anticipated future challenges that hinder the successful integration of MOOCs in public universities across Malaysia.

2. LITERATURE REVIEWS

2.1 INTRODUCTION OF MOOCS

This section will enrich the existing literature reviews and aims to explore the evolution of MOOCs in general, the development of MOOCs in Malaysia and Malaysian public universities, focusing on factors influencing adoption, students' satisfaction, and readiness.

The term "MOOCs" was coined in 2008 by Dave Cormier and Bryan Alexander in Canada to describe an open online course titled "Connectivism and Connective Knowledge" at the University of Manitoba. This course, developed by Stephen Downes and George

Siemens, was offered to 25 fee-paying on-campus students and 2300 members of the public for free (Daniel, 2012; deWaard, 2011; Siemens, 2013). The course content was delivered through RSS feeds. The year 2012 marked a pinnacle for the emergence of MOOCs, as they gained coverage on the front pages of prominent newspapers and magazines (Pappano, 2012). In the same year, Daniel (2012) critically assessed the initial decline in MOOC development. Nevertheless, MOOCs continued to be designed, taken, and researched throughout the latter part of the 2000s (Shah, 2019).

MOOCs offer flexible and accessible learning opportunities, allowing students to engage in online courses from anywhere at any time (Liyanagunawardena et al., 2013). Hence, the literature on MOOCs has grown rapidly, with numerous research papers published on various aspects of MOOCs (Liyanagunawardena et al., 2013). A recent trend in modern higher education is the Massive Open Online Course (MOOC), which offers an opportunity for many participants from around the world to enroll in free online courses without any admission requirements. This approach to learning provides a diverse array of options across various disciplines (Abu-Shanab & Musleh, 2018). MOOCs serve as a platform for interaction and collaboration, enabling participants to share information and enhance their knowledge (Zhang, Gao, & Zhang, 2021). The primary goal of MOOCs is to provide high-quality education to individuals interested in learning globally (Azevedo & Marques, 2017).

The concept of "all-at-onceness" captured the intricate nature of MOOCs, encompassing the utilization of platforms and social networks like Moodle, Skype, Twitter, blogs, and chatrooms for disseminating knowledge and facilitating learning (Koutropoulos & Hogue, 2012). MOOCs further evolved to include hybrid designs that combined connectivist and extended MOOC principles (Bozkurt, Kilgore, & Crosslin, 2018; Roberts, Waite, Lovegrove, & Mackness, 2013). Initially, MOOCs garnered significant participant numbers and raised substantial expectations about their potential to revolutionize or even disrupt higher education (Dillahunt, Wang, & Teasley, 2014; Hansen & Reich, 2015). Figure 1 illustrates the progress of MOOCs on Garther's Hype Cycle.

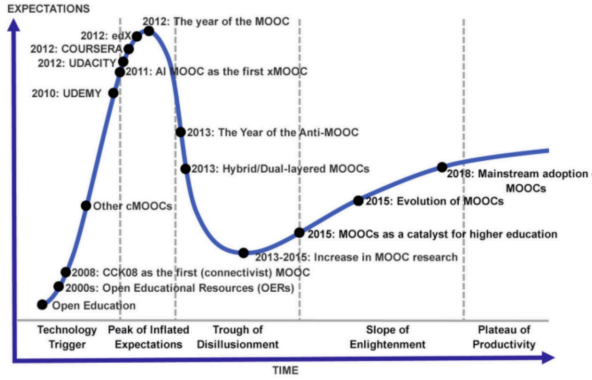


Fig 1: Progress of MOOCs on Gartner's Hype Cycle (Adopted from Bozkurt, Özdamar Keskin, & de Waard, 2016)

2.2 MOOCS PLATFORMS AROUND THE WORLD

Class Central functions as an online course platform proclaiming itself to be the leading "MOOCs Search Engine," containing an extensive collection of over 50,000 courses spanning various universities (Class Central, 2021). However, the platform's course offerings can solely be sorted using fundamental categories, including collections (individually curated), providers, rankings, and subjects (Class Central, 2021). In contrast, Udemy, another prominent MOOC platform, offers a more comprehensive array of courses alongside enhanced filters. With a repertoire exceeding 183,000 video-based online courses, Udemy allows users to explore and opt for courses by topic. Notably, within the overarching topic category, there are subcategories such as cost, language, proficiency levels, attributes, ratings, subtitles, and video duration (Udemy, 2021). Additionally, the attributes category encompasses coding exercises, subtitles, practice assessments, and quizzes. Similar to Udemy's structure, edX offers a comparable setup while presenting a more modest selection of 3000 online courses (edX, 2021). Similarly, users can either choose a subject listed on the main page or directly access courses from the navigation bar. However, edX expands user choices by allowing them to narrow down results using categories like program, provider, subject, language, learning type, and availability. Coursera boasts approximately

5000 online courses and presents users with a landing page enabling direct course searches or swift access to links pertaining to degrees, objectives, providers, skills, certificates, subjects, and free courses (Coursera, 2021). Coursera's search results extend to encompass categories such as level, language, skills, duration, partners, subject, and learning products (Coursera, 2021). Other platforms such as Khan Academy (2021) offer fewer categories and filtering options for users, where it primarily permits searches based on subjects and formal prerequisites (MOOC List, 2021). FutureLearn distinguishes its courses based on their length, categorizing offerings as short courses, micro-credentials and programs, expert tracks, and online degrees (FutureLearn, 2021).

2.3 MOOCS IN MALAYSIA

The Ministry of Education Malaysia (MOE) introduced a blueprint outlining strategies for higher education from 2015 to 2025, highlighting the significance of MOOCs in the country's education system. This plan aims to enhance education quality and accessibility using MOOCs (Ministry of Education Malaysia, 2015). In October 2014, Malaysia became the first country to implement MOOCs for academic credit in all public universities, supported by a budget of 500 million MYR (about 138.6 million USD) (Albelbisi, 2019). Initially, four MOOC courses were created on the OpenLearning platform, covering subjects like Islamic and Asian Civilizations, Ethnic Relations, Entrepreneurship, and ICT Competence for first-year undergraduates. Later on, six institutions, including public and private universities like Open University Malaysia, Taylor's University, UPM, UKM, UiTM, and UNIMAS, expanded MOOC offerings to a total of 36 courses (Mansor et al., 2015). These courses were hosted on the "OpenLearning" platform in Australia and attracted participants from various educational backgrounds in Malaysia. In September 2014, Malaysia's MOOC platform, OpenLearning, was officially launched, becoming the designated platform for higher education institutions. Currently, it offers more than 681 courses (OpenLearning, 2017).

2.4 PROSPECTS AND FUTURE IMPLICATIONS

MOOCs have gained widespread public attention in and have attracted millions of learners worldwide and are considered an excellent medium for promoting lifelong learning. However, high dropout rates in MOOCs are still the most common problem with the service. According to the research conducted by Zhang et al. (2022), the present course completion rate for MOOCs ranges from a mere 5 percent to 40 percent. Enhancing course completion rates in MOOCs has emerged as a prominent concern among scholars. Surveys of MOOC completers indicate positive effects on job prospects.

Nevertheless, according to studies conducted among hiring managers, MOOCs are generally regarded in a negative light (Rivas et al., 2020). This indicates that there is more potential that warrants further investigation to enhance the efficiency of MOOCs. The issue of internet connectivity is a significant challenge when it comes to MOOCs. According to Clay (2013), MOOCs necessitate a significant reliance on internet connectivity due to their online nature. Consequently, learners must have a reliable internet connection to access course materials, engage in discussions, and submit assignments. The limited availability of bandwidth in low-resource countries is a significant hurdle to fully leveraging the potential of MOOCs, particularly in locations with poor internet infrastructure or low bandwidth capacity. This has prompted MOOC designers to reconsider course elements and optimize them for limited bandwidth. Recognizing the issue of internet connectivity, some MOOC providers have started offering offline options. For example, MOOC Camp allows learners without internet access to download course materials and complete assignments offline (Trainer, 2014). However, allowing offline flexibility may come with other issues as well. Meanwhile, the increasing use of new applications, devices, and modes of learning has led to a growing demand for bandwidth in educational institutions. This can impact the availability and quality of internet connectivity for MOOC learners. Hence, it is important to address the issue of internet connectivity to ensure equal access to education and the benefits of MOOCs. Continuous efforts must be made to improve internet infrastructure and explore offline options to make MOOCs more accessible to learners with limited connectivity.

2.5 CHALLENGES OF MOOCS

The key challenges identified in the present implementation include limited faculty buy-in and engagement, lack of appropriate technological infrastructure, concerns over course quality and accreditation, and difficulties in assessing and recognizing learners' achievements. Additionally, issues related to cultural barriers and language diversity within the Malaysian context are also found to influence the effective utilization of MOOCs. Looking into the future, this research will also explore potential challenges that may arise in the continued implementation of MOOCs in public universities in Malaysia. Anticipated challenges include evolving pedagogical practices, ensuring equitable access for all learners, addressing the digital divide, and keeping pace with rapidly advancing technology. The challenge for MOOC is the need to optimize learner activities in an online learning environment. Infrastructure, content, and facilitation considerations, would, therefore, consider the nature of online learners in terms of competencies, prior knowledge, motivation, and expectations, and therefore, create a non-formal, ubiquitous, and flexible community that support and encourage active learner engagement for an optimal learning experience. According to Sun et al. (2008), flexibility is viewed as an important factor in eLearning satisfaction. The advantage of online education to learners is its flexibility in choosing the most suitable learning methods to accommodate their needs.

MOOCs rely heavily on the use of technologies to ensure the accessibility of information and knowledge. This emphasizes the need for students and facilitators to be competent in the usage of digital instructions and technologies. The assumption is that if learners find the technology infrastructure comprising the MOOC platform user-friendly and the content useful, then the possibility of learner retention is high.

In research investigating critical factors influencing learner satisfaction, Sun et al. (2008) listed courses quality as the most important concern in an eLearning environment. Course content design and presentation appears to play an important role in students' perceived usefulness and

ease of use of a course and will have an impact on students' satisfaction. As mentioned by Drake, O'Hara and Seeman (2015), course content must incorporate five principles as a foundation to inform the MOOC course designers and course managers, in designing and developing the new course, namely – meaningful, engaging, measurable, accessible, and scalable. A well-thought curriculum design in developing a MOOC is therefore necessary. There is a need to emphasize the importance of the course design with appropriate assessment format and load, without compromising the quality of the course.

Facilitation is an important element in sustaining MOOC participation and engagement. Any MOOCs platform must take note of the essential's facilitator features, like positive attitude, pedagogical content knowledge, interactive style and perceived availability (Hiltz, 1993), since the facilitator's behavior convey cues that motivate and shape students' experience (Mathieu, Martineau & Tannabaum, 1993).

In the realm of Malaysian universities, there are numerous challenges associated with the implementation of Massive Open Online Courses (MOOCs). For instance, while MOOCs offer the advantages of free accessibility and flexible learning at one's convenience, various studies (Mansor et al., 2015; Fadzleen et al., 2015; Wahid et al., 2019; Ulrich et al., 2015) have identified hurdles in integrating MOOCs within university student populations. A noteworthy concern pertains to the restricted availability of these platforms. Certain MOOCs are intended as supplementary tools for students in traditional Malaysian universities, thus confining their accessibility mainly to this specific group (Mansor et al., 2015).

A predominant challenge is the low completion rate and a substantial dropout rate, indicative of poor retention among students (Bozkurt et al., 2016; Stepanyan et al., 2015) especially for students who enroll out of personal interest. In addition, the effective utilization of MOOCs necessitates specific skills not universally possessed. Attaining proficiency with the platform is pivotal for meaningful engagement (Al-Rahmi et al., 2019). Deficiencies in these skills can impede successful MOOC completion (Zhang, Chen, & Phang, 2018). Another

significant obstacle is the dearth of self-regulated learning skills among students, which influences the effectiveness of MOOCs. Proficiency in self-regulated learning is critical for autonomous learning within MOOCs (Zalli et al., 2019).

Moreover, the issue of awarding credentials and credits in the context of MOOCs is contentious (Chen, 2013; Gerber, 2014). Granting credits faces challenges, notably in upholding academic integrity (Hanover Research, 2014). Evaluation methods have been subject to critique, and only a few platforms have instituted verification systems to ensure participant authenticity (Atiaja and Proenza, 2016). Responding to this, in 2016, the Minister of Higher Education Malaysia announced the country's pioneering role in establishing a credit recognition policy for MOOCs (Shahar, 2016).

Pedagogical considerations remain a hurdle in MOOC implementation within universities. Certain studies propose that students may encounter difficulties with connectivity learning approaches (Dewar et al., 2014). Meanwhile, pre-recorded instructional videos are consumed outside the classroom, and peer discussions and collaborative activities take place in physical settings. However, this approach can constrain real-world interactions and experiential learning (Hanover Research, 2014). Following this, instructors in the realm of MOOCs play a pivotal role in shaping the learning experience, facilitating interactions, and promoting engagement (Zhang et al., 2018). However, they grapple with challenges such as managing sizable groups, addressing cross-cultural considerations, and employing diverse teaching methods (Garcia-Loro et al., 2020).

Next, technical challenges encompassing applications, equipment, software, and internet support necessitate consideration for effective MOOC implementation. Internet connectivity can be problematic, particularly in developing nations (Dewar et al., 2014). Addressing these technical issues is imperative in the initial phases of MOOC development, preceding course design and creation. Reliable support is pivotal for producing high-quality MOOCs. Adequate broadband access, internet coverage, and advanced mobile devices or tools are essential for sustaining MOOC practice. This is attributed to the need

for robust technology to accommodate the storage of instructional videos and high-capacity digital content (Dewar et al., 2014). In addition to this, instructors also required consistent internet or Wi-Fi coverage to ensure uninterrupted MOOC delivery throughout the course duration. A study involving twenty participants highlighted a significant challenge related to technology infrastructure, particularly affecting individuals in economically disadvantaged, or rural areas due to limited internet access (Albelbisi et al., 2018).

2.6 EMERGING ISSUES: MOOCS IN MALAYSIAN PUBLIC UNIVERSITIES CONTEXT

The implementation of e-learning system by the universities has promised better quality as the internet makes teaching and learning available anytime and anywhere without any boundaries. However, despite all the benefits of using e-Learning, especially MOOCs depends on the level of individual and social support available (Ibhrahim et al., 2012). Several emerging issues that have impacted successful MOOCs implementations in higher education have been cited.

The adoption of MOOCs in Malaysian public universities has been influenced by various factors. The Malaysian Ministry of Education has played a crucial role in promoting and supporting the MOOC initiative (Albelbisi et al., 2023). The Ministry's recommendations for the Redesign Education System towards IR 4.0 have emphasized the importance of MOOCs in delivering teaching and learning approaches (Yue, 2022).

Moreover, one important aspect of MOOCs' adoption in education is the completion rates of these courses. Studies have shown that completion rates vary widely, ranging from 0.7% to 52.1% Jordan (2015). Factors such as course length, start date, and assessment type can influence completion rates. Hence, longer courses tend to have lower completion rates, while more recent courses have higher completion rates. Courses that use auto grading only for assessments also tend to have higher completion rates (Jordan, 2015).

Other than that, the perceived usefulness of MOOCs also plays an important role in MOOC adoption. Research has shown that the perceived usefulness of MOOCs has a significant influence on their adoption (Ma & Lee, 2018). When learners perceive that MOOCs can provide valuable knowledge and skills, they are more likely to adopt them. The perceived ease of use and usefulness of MOOC platforms also have been studied in the context of specific courses offered in Malaysian public universities. The MOOC platform used in the Islamic and Asian Civilization (TITAS) course has been found to increase students' interest and deepen their knowledge in civilization and global issues (Halim et al., 2022). The MOOC TITAS platform has also been recognized for its potential in practising blended learning and enhancing the effectiveness of teaching and learning sessions (Halim et al., 2022). Additionally, the perceived ease of use and usefulness of the MOOC TITAS platform have been measured among first-year students in Malaysian public universities (Halim et al., 2022). This suggests that promoting the benefits and practical applications of MOOCs can encourage their adoption in Malaysia.

The lack of accessibility to MOOCs also influences MOOC adoption. In a developing country like Malaysia, where there may be limitations in infrastructure and access to quality learning resources, the accessibility of MOOCs becomes crucial (Ma & Lee, 2018). Improving the accessibility of MOOCs by addressing issues such as internet connectivity and availability of devices can facilitate their adoption in Malaysia. Moreover, the attitude of learners towards MOOCs also plays a role in their adoption.

Studies have found that Malaysian learners generally have a positive attitude towards MOOCs, perceiving them as interesting and easier learning platforms (Albelbisi et al., 2023). This positive attitude can contribute to the adoption of MOOCs in Malaysia. Additionally, the quality of courses offered through MOOCs is an important factor. Learners' perception of course quality influences their decision to adopt MOOCs (Albelbisi et al., 2023). Ensuring that MOOCs provide high-quality content, interactive learning experiences, and individualized instructions can enhance their adoption in Malaysia. Student satisfaction is an important aspect to consider in the evolution

of MOOCs and e-learning in Malaysian public universities. Self-regulated learning strategies have been found to positively impact learners' satisfaction in MOOCs (Zalli et al., 2019). The role of self-regulated learning components, such as time management, planning, self-evaluation, and help-seeking, has been examined in relation to learners' satisfaction in a specific MOOC course (Zalli et al., 2019).

In contrary, students' readiness towards the use and application of MOOCs has been investigated, revealing a lack of literature on Malaysian students' readiness (Hashim et al., 2019). Furthermore, the support and involvement of instructors are crucial for the successful adoption of MOOCs. Lack of instructor support has been identified as a challenge to the adoption of MOOCs in Malaysia (Albelbisi et al., 2023). Providing adequate support and guidance to learners through various means, such as discussion forums and online assistance, can address this challenge and promote the adoption of MOOCs.

Hence, understanding these factors and addressing any barriers can help promote the adoption of MOOCs and bridge the digital divide in the Malaysian higher education system (Ma & Lee, 2018; Albelbisi et al., 2023).

Furthermore, the development of MOOCs has been seen as a major transformation in the delivery of education, representing the next stage in the evolution of open educational resources (Gómez et al., 2022). MOOCs have the advantage of being available to an unlimited number of students and have become a prominent part of the higher education system (Pant & Pant, 2021). They provide a platform for individuals to enhance their educational status or learn new technologies (Putra et al., 2020).

CONCLUSION AND RECOMMENDATIONS

Massive Open Online Courses (MOOCs) have gained significant attention in the field of education as a means of delivering education on a large scale (Liyanagunawardena et al., 2013). However, there are several challenges and prospects to consider when implementing MOOCs in Malaysian

public universities. One of the main challenges in implementing MOOCs in Malaysian public universities is ensuring access to reliable internet connectivity and adequate technological infrastructure (Albelbisi et al., 2023; Liyanagunawardena et al., 2013). This is crucial for students to fully participate in online courses and access course materials. Efforts should be made to address this challenge and provide the necessary infrastructure to support MOOC implementation. Another challenge is the language barrier. Most MOOCs are offered in English, which may limit the participation of non-English speaking students in Malaysia (Albelbisi et al., 2023; Liyanagunawardena et al., 2013). To address this challenge, courses should be provided in multiple languages to cater to a diverse student population. Maintaining the quality assurance of MOOCs is also a challenge, as the courses are often developed by different institutions and instructors (Liyanagunawardena et al., 2013). Ensuring that the content is accurate, up-to-date, and aligned with the learning outcomes of the respective courses is essential. Another approach to addressing the challenges is by implementing strategies that have been shown to be effective in enhancing the adoption and engagement of MOOCs. For example, gamification has been found to increase student engagement and motivation in MOOCs (Romero-Rodríguez et al., 2019). Incorporating gamification strategies, such as challenges, leaderboards, and badges, into the design of MOOCs, can help universities enhance the learning experience and overcome challenges related to low completion rates and dropout rates (Romero-Rodríguez et al., 2019).

Furthermore, addressing the challenges of MOOC implementation requires considering the perspectives and needs of different stakeholders, including instructors and students. Instructors play a crucial role in designing and delivering MOOCs, and they need to be equipped with the necessary skills and knowledge to effectively engage with diverse student populations (Diordieva & Bonk, 2023). Providing professional development opportunities and support for instructors can help address the challenges associated with the large number of students from different backgrounds and motivational situations (Diordieva & Bonk, 2023).

Despite these challenges, there are several prospects for implementing MOOCs in Malaysian public universities. MOOCs have the potential to provide access to education for individuals who may not have the opportunity to pursue formal education due to financial constraints or

geographical limitations (Pursel et al., 2016). Implementing MOOCs in Malaysian public universities can help bridge the education gap and provide learning opportunities to a wider audience. MOOCs also offer flexibility in terms of time and location, allowing learners to study at their own pace and convenience (Pursel et al., 2016). The inclusion of student support services as one of the features of MOOCs is particularly beneficial for working professionals and individuals who are interested in lifelong learning. It will provide comprehensive student support services to enhance the learning experience and increase student engagement in MOOCs. This can include online tutoring, discussion forums, peer-to-peer support, and access to additional learning resources. Additionally, offering language support services for non-English speaking students can help overcome language barriers (Liyanagunawardena et al., 2013).

Implementing MOOCs in Malaysian public universities can cater to the diverse needs of learners and promote continuous learning. Furthermore, MOOCs provide opportunities for learners to collaborate with peers from different backgrounds and countries (Pursel et al., 2016). This can enhance cross-cultural understanding and facilitate networking among learners. Moreover, offering professional development programs and training for instructors to equip them with the necessary skills and knowledge to effectively design and deliver MOOCs. This can include pedagogical training, instructional design workshops, and technological support. Instructors should be encouraged to adopt innovative teaching methods and leverage the interactive features of MOOC platforms (Liyanagunawardena et al., 2013). Equally important, encouraging research and evaluation of MOOCs in the Malaysian context can give insights into their effectiveness, impact, and best practices. This can inform future improvements and help identify areas for further development. Collaboration with researchers and institutions that have conducted studies on MOOCs can provide valuable guidance (Liyanagunawardena et al., 2013).

In conclusion, addressing the challenges of implementing MOOCs in Malaysian public universities requires a multi-faceted approach. This involves taking specific actions to overcome barriers to issues such as access and infrastructure, language barrier, quality assurance, implementing effective strategies, such as gamification, to enhance student engagement and motivation, internet connectivity and considering the perspectives and

needs of instructors and students is crucial for successful implementation. Additionally, considering the prospects of providing access to education, flexibility, and collaboration of MOOCs can enhance the educational landscape in Malaysian public universities. By addressing these challenges, Malaysian public universities can harness the prospects of MOOCs and enhance the educational landscape in Malaysia.

ACKNOWLEDGEMENTS

We gratefully acknowledge the research grant provided by the Faculty of Business and Management, UiTM Selangor, Puncak Alam Campus that supported the completion of this work. The financial assistance enabled us to delve into this research and contribute to the advancement of knowledge in our field. We also extend our heartfelt appreciation to the individuals who generously offered their expertise and assistance during the completion of this research. Their guidance, feedback, and insightful discussions were invaluable in shaping the direction of our study. Their support and encouragement have been instrumental in the successful completion of this project. We are truly thankful for their involvement and contribution to our research endeavour.

REFERENCES

Al-Rahmi, W., Yahaya, N., Alamri, M., Alyoussef, I., Al-Rahmi, A., & Kamin, Y. (2019). Integrating innovation diffusion theory with technology acceptance model: Supporting students' attitude towards using a massive open online course (MOOCs) system. Interactive Learning Environments, 1–13. https://doi.org/10.1080/10494820.2019.1629599

Albelbisi, N. A., Al-Adwan, A. S., Habibi, A. (2023). A Qualitative Analysis of the Factors Influencing the Adoption of MOOC In Higher Education. Turkish Online Journal of Distance Education, 2(24), 217-231. https://doi.org/10.17718/tojde.973956

Alario-Hoyos, C., Pérez-Sanagustín, M., Delgado-Kloos, C., G, H. J., Munoz-Organero, M. (2014). Delving Into Participants' Profiles and Use of Social Tools in MOOCs. IEEE Transactions on Learning Technologies, 3(7), 260-266. https://doi.org/10.1109/tlt.2014.2311807

Abu-Shanab, E., & Musleh, S. (2018). The adoption of massive open online courses: Challenges and benefits. International Journal of Web-Based Learning and Teaching Technologies, 13(4), 62–76. https://doi.org/10.4018/IJWLTT.2018100104.

Albelbisi, N., Yusop, F. D., & Salleh, U. K. M. (2018). Mapping the factors influencing success of massive open online courses (MOOC) in higher education. Eurasia Journal of Mathematics, Science and Technology Education, 14(7), 2995-3012.

Albelbisi, N. A., & Yusop, F. D. (2019). Factors influencing learners' self–regulated learning skills in a massive open online course (MOOC) environment. Turkish Online Journal of Distance Education, 20(3), 1-16

Albelbisi, N. A., Al-Adwan, A. S., & Habibi, A. (2023). A qualitative analysis of the factors influencing the adoption of mooc in higher education. Turkish Online Journal of Distance Education, 24(2), 217-231.

Atiaja, L., & Proenza, R. (2016). MOOCs: Problems and Challenges in Higher Education. In International Conference on Advances in Education, Teaching & Technology, pp. 82-88, Canada: Unique Conference Canada

Azevedo, J., & Marques, M. M. (2017). MOOC success factors: Proposal of an analysis framework. Journal of Information Technology Education: Innovations in Practice, 16, 233–251. https://doi.org/10.28945/ 3861.

Bárcena, E., & Martín-Monje, E. (2014). Introduction. Language MOOCs: An emerging field. In E. Martín-Monje, & E. Bárcena (Eds.), Language MOOCs: Providing learning, transcending boundaries (pp. 1-15). De Gruyter Open. https://doi.org/10.2478/9783110420067.1

Bárcena, E., Martín-Monje, E., & Read, T. (2015). Potentiating the human dimension in language MOOCs. In Proceedings of the European Stakeholder Summit (pp. 46-54).

Bárcena, E., Read, T., Martín-Monje, E., & Castrillo, M. D. (2014). Analyzing student participation in foreign language MOOCs: A case study. In Proceedings of the EMOOCs 2014: European MOOCs Stakeholders Summit (pp. 11-17).

Bonk, C. J. (2020). Pandemic ponderings, 30 years to today: Synchronous signals, saviors, or survivors? Distance Education, 41(4), 589-599. https://doi.org/10.1080/01587919.2020.1821610

Bonk, C. J., & Wiley, D. (2020). Preface: Reflections on the waves of emerging learning technology. Educational Technology Research and Development, 68(4), 1595-1612. https://doi.org/10.1007/s11423-020-09809-x

Bonk, C. J., Lee. M. M., Reeves, T. C., & Reynolds, T. H. (2018). The emergence and design of massive open online courses. In R. A. Reiser & J. V. Dempsey (Eds.), Trends and issues in instructional design & technology (4th Ed., pp. 250-258). Pearson Education.

Bonk, C. J., Zhang, K., Reeves, T. C., & Reynolds, T. H. (2020). Preface: MOOCs and open education—Wandering and winding our way to today. In K. Zhang, C. J. Bonk, T. C. Reeves, & T. H. Reynolds, T. H. (Eds.), MOOCs and open education in the global south: Challenges, successes, and opportunities (pp. xvi-xxxiii). Routledge

Bozkurt, A., Keskin, N. O., & De Waard, I. (2016). Research trends in massive open online course (MOOC) theses and dissertations: Surfing the tsunami wave. Open Praxis, 8(3), 203-221.

Bozkurt, A., Kilgore, W., & Crosslin, M. (2018). Bot-teachers in hybrid massive open online courses (MOOCs): A post-humanist experience. Australasian Journal of Educational Technology, 34(3),39-59. doi:10.14742/ajet.3273

Brennan, K. (2013). In connectivism, no one can hear you scream: A guide to understanding the MOOC novice. Hybrid Pedagogy. http://hybridpedagogy.org/inconnectivism-no one-can-hear-you-scream-a-guide-to-understanding-the-mooc-novice/

Cheal, C. (2013). Creating MOOCs for college credit: SJSU's partnership with edX and Udacity (Research Bulletin). Louisville, CO: EDUCAUSE Center for Analysis and Research (August 14, 2013). Retrieved from http://www.educause.edu/ecar

Chen, Weiping. (2013). Perceived value in community supported agriculture (CSA): A preliminary conceptualization, measurement, and nomological validity. British Food Journal. https://doi.org/10.1108/BFJ-01-2011-0013

Class Central. (2021). Subjects (17 November 2021). https://www.classcentral.com/subjects

Clay, J. (2013). So, what if I am not connected? - eLearning Stuff. So, What if I Am Not Connected? - eLearning Stuff. https://elearningstuff.net/2013/04/15/so-what-if-i-am-not-connected/

Coursera. (2021). Impact report. https://blog.coursera.org/courseraimpactreport-2021

Daniel, J. (2012). Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility. Retrieved from http://sirjohn.ca/wordpress/wp-content/uploads/2012/08/120925MOOCspaper2.pdf

Davis, F.D., (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance for Information Technology, MIS Quarterly, 13(3), pp. 319-340.

Dewar, E., J. Uhomoibhi, M. Ross, and D. Hutty. (2014). MOOCs development and implementation: The challenges and prospects for higher education in emerging countries." Manuscript submitted for publication.

deWaard, I. (2011). Explore a new learning frontier: MOOCs. Learning Solutions Magazine. Retrieved from https://learningsolutionsmag.com/articles/721/explore-a-new learning-frontier moocs

Dillahunt, T. R., Wang, B. Z., & Teasley, S. (2014). Democratizing higher education: Exploring MOOC use among those who cannot afford a formal education. The International Review of Research in Open and Distributed Learning, 15(5), 1-20. doi:10.19173/irrodl. v15i5.1841

Ding, Y., & Shen, H. (2021). English language MOOCs in China: Learners' perspective. The Euro CALL Review, 28(2), 13-22. https://doi.org/10.4995/eurocall.2020.13090

Diordieva, C. (2020). Instructional strategies and challenges for language-based massive open online courses (LMOOC): An international investigation [Doctoral dissertation, Texas Tech University].

Diordieva, C., & Bonk, C. J. (2023). Instructors' perspectives in design and L-MOOCs: A qualitative look. Contemporary Educational Technology, 15(3), ep425. https://doi.org/10.30935/cedtech/13099

Downes, S. (2019). Recent work in connectivism. European Journal of Open, Distance and E-Learning, 22(2), 113- 132. https://doi.org/10.2478/eurodl-2019-0014 edX. (2021). Courses by subjects (17 November 2021). https://www.edx.org/subjects

Drake, J.R., O'Hara, M. & Seeman, E. (2015). Five Principles for MOOC Design: With a Case Study. Journal of Information Technology Education:Innovations in Practice, 14, pp. 125-143.

Education Intelligence Unit. (2021) MOOCs Then Now Next. Holoniq. https://www.holoniq.com/notes/moocs-then-now-next

edX. (2021). https://www.edx.org/subjects Fordham University. (2021). Types of online learning. https://www.fordham.edu/info/24884/online_learning/7897/types_of_online_learning

Fordham University. (2021). Types of online learning. https://www.fordham.edu/info/24884/online_learning/7897/types_of_online_learning.

FutureLearn. (2021). Subjects. https://www.futurelearn.com/subjects

Garcia-Loro, F., Martin, S., Ruiperez-Valiente, J. A., Sancristobal, E., & Castro, M. (2020). Reviewing and analyzing peer review Inter-Rater Reliability in a MOOC platform. Computers & Education, 154, 103894

Gerber, Joanna. (2014). MOOCs: Innovation, disruption, and instructional leadership in higher education. University of California, Los Angeles

Halim, A. A., Othman, N., Azri, N., Samir, N. M. (2022). Perceived Ease of Use and Perceived Usefulness of Mooc Titas Platform in The Era of Revolution Industri 4.0. International Journal of Academic Research in Business and Social Sciences, 10(12). https://doi.org/10.6007/ijarbss/v12-i10/15216

Hanover Research (2014). MOOC trends and implementation at community colleges. Retrieved from www.hanoverresearch.com/media/MOOC-Trends-and Implementation-at-Community-Colleges.pdf

Hansen, J. D., & Reich, J. (2015). Democratizing education? Examining access and usage patterns in massive open online courses. Science, 350(6265), 1245-1248. doi:10.1126/ science. aab3782

Hiltz, S.R. (1993). Correlates of Learning in a Virtual Classroom. Int. J. Man-Machine Studies, 39 pp. 71-98.

Ibhrahim Z., Norazlan A., Zatul Himmah A, K, & Mazuin, M. H., (2012). User's Usage Intention on E-Learning Portal: A Case Study of i-Learn Portal at UiTM Cawangan Kelantan.

Jitpaisarnwattana, N., Darasawang, P., & Reinders, H. (2022). Understanding affordances & limitations in a language MOOC from an activity theory perspective. RPTEL, 17, 9. https://doi.org/10.1186/s41039-022- 00186-y

Jordan, K. (2015). Massive Open Online Course Completion Rates Revisited: Assessment, Length and Attrition. The International Review of Research in Open and Distributed Learning, 3(16). https://doi.org/10.19173/irrodl.v16i3.2112

Kinuthia, & S. Marshall (Eds.), Open educational resources: Innovation, research, and practice (pp. 5–16). Vancouver: Commonwealth of Learning, Athabasca University

Khan Academy. (2021). Startpage. https://www.khanacademy.org

Koutropoulos, A., & Hogue, R. J. (2012). How to succeed in a MOOC – massive online open course. Retrieved from https://learningsolutionsmag.com/articles/1023/how-to-succeed-in-amassive-online-open-course-mooc

Liyanagunawardena, T. R., Adams, A. B., Williams, S. (2013). Moocs: A Systematic Study of The Published Literature 2008-2012. The International Review of Research in Open and Distributed Learning, 3(14), 202. https://doi.org/10.19173/irrodl.v14i3.1455

Ma, L., & Lee, C. (2018). Investigating the adoption of MOOC s: A technology–user environment perspective. Journal of Computer Assisted Learning, 35(1), 89–98. https://doi.org/10.1111/ jcal.12314.

Mansor, F., Latifah, A. L., & Amina, M. (2015). MOOCs in Malaysia: a preliminary case study. Paper presented at E-ASEM Forum: Renewing the Lifelong Learning Agenda for The Future. Bali, Indonesia.

Martín-Monje, E. & Bárcena, E. (Eds.). (2015). Language MOOCs: Providing learning, transcending boundaries. De Gruyter Open. https://doi.org/10.2478/9783110420067

Mathieu, J. E., Martineau, J. W. & Tannenbaum, S.I. (1993). Individual and Situational Influences on the Development of Self-Efficacy: Implications for Training Effectiveness, Personal Psychology, 46, pp. 125-147.

Ministry of Education Malaysia (2015). Executive summary: Malaysia Education Blueprint 2015-2025 (Higher Education). Retrieved from https://www.mohe.gov.my

MOOC List. (2021). Categories. https://www.mooc-list.com/categories

Motzo, A., & Proudfoot, A. (2017). MOOCs for language learning–opportunities and challenges: The case of the Open University Italian beginners'MOOCs. In K. Qian, & S. Bax (Eds.), Beyond the language classroom: Researching MOOCs and other innovations, 85-97. Research-publishing.net. https://doi.org/10.14705/rpnet.2017.mooc2016.673

Nor Fadzleen, S. D., A. A. Rose, and O. Naoki. (2015) "Stakeholders'view on MOOCs sustainability in Malaysian higher education: A preliminary study." ARPN Journal of Engineering and Applied Sciences 10 (23). 18104- 18112.

OpenLearning (2017). Malaysia Massive Open Online Courses (MOOC). Retrieved from https://www.openlearning.com/malaysiamoocs

Pant, T. and Pant, S. (2021). The Technology Shift for Mooc-based Libraries. Research Anthology on Collaboration, Digital Services, and Resource Management for the Sustainability of Libraries, 729-738. https://doi.org/10.4018/978-1-7998-8051-6.ch041

Putra, A. B. N. R., Mukhadis, A., Tuwoso, T., Ulfatin, N., Wonorahardjo, S., Habiddin, H., ... & Tee, T. K. (2020). The Innovation of Mooc Based E-marketing To Improve Entrepreneurship Administration Management for Vocational Education Students In Industrial Revolution 4.0 Era. JPP (Jurnal Pendidikan Dan Pembelajaran), 1(27), 1-10. https://doi.org/10.17977/um047v27i12020p001

Pursel, B. K., Zhang, L., Jablokow, K. W., Choi, G. W., & Velegol, D. (2016). Understanding MOOC students: Motivations and behaviours indicative of MOOC completion. Journal of Computer Assisted Learning, 32(3), 202-217.

Pappano, L. (2012, November 2). The Year of the MOOC. The New York Times. Retrieved from http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-coursesare-multiplying-at-a-rapid-pace.html

Qian, K., & Bax, S. (2017). Introduction to beyond the language classroom: Researching MOOCs and other innovations. In K. Qian, & S. Bax (Eds.), Beyond the language classroom: Researching MOOCs and other innovations (pp. 1-4). Research publishing.net. https://doi.org/10.14705/rpnet.2017.mooc2016.666

Rivas, M. J., Baker, R. B., & Evans, B. J. (2020, October). Do MOOCs Make You More Marketable? An Experimental Analysis of the Value of MOOCs Relative to Traditional Credentials and Experience. AERA Open, 6(4), 2332858420973577. https://doi.org/10.1177/2332858420973577

Roberts, G., Waite, M., Lovegrove, E. J., & Mackness, J. (2013). x v c: Hybridity in throughand about MOOCs. Proceedings of OER13: Creating a virtuous circle (pp. 1-8). Milton Keynes, UK. Retrieved from https://www.medev.ac.uk/oer13/file/79/9/

Rodriguez, O. C. (2012). MOOCs and the AI-Stanford like courses: Two successful and distinct course formats for massive open online courses. European Journal of Open, Distance and e-Learning, 2012(II). http://www.eurodl.org/index.php?p=archives&year=2012&halfyear=2&articl =516

Romero-Rodríguez, L. M., Ramirez-Montoya, M. S., González, J. R. V. (2019). Gamification In MOOCs: Engagement Application Test in Energy Sustainability Courses. IEEE Access, (7), 32093-32101. https://doi.org/10.1109/access.2019.2903230

Shah, D. (2019, January 6). Year of MOOC based Degrees: A Review of MOOC Stats and Trends in 2018.Class Central. Retrieved from https://www.class-central.com/report/moocs-stats-and-trends-2018

Shahar, F. M. (2016). Malaysia to become first country to develop credit recognition policy for online courses. New Straits Times. 18.

Siemens, G. (2005). A learning theory for the digital age. Instructional Technology and Distance Education, 2(1), 3-10

Siemens, G. (2013). Massive open online courses: Innovation in education. In R. McGreal, W.

Stracke, C. M., Downes, S., Conole, G., Burgos, D., & Nascimbeni, F. (2019). Are MOOCs open educational resources? A literature review on history, definitions, and typologies of OER and MOOCs. Open Praxis, 11(4), 331–341. https://doi.org/10.5944/openpraxis.11. 4.1010.

Stracke, C. M., Downes, S., Conole, G., Burgos, D., & Nascimbeni, F. (2019). Can MOOCs be considered as Open Educational Resources? In Proceedings of the Open Education Global Conference 2019.

Stracke, C. M., Burgos, D., & Tlili, A. (2023). Instructional quality and learning design of massive open online courses. In Handbook of Open, Distance and Digital Education (1391-1412). Singapore: Springer Nature Singapore.

Stepanyan, Karen, Allison Littlejohn, and Anoush Margaryan. (2013). "Sustainable e-learning: Toward a coherent body of knowledge." Journal of Educational Technology & Society, 16(2): 91-102.

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y. & Yeh, D. (2008). What Drives a Successful eLearning? An Empirical Investigation of the Critical Factors Influencing Learners Satisfaction. Computers and Education, 50 (4), pp.1183-1202.

Trainer, M. (2014, October 29). No Internet? Take an online course offline at MOOC Camp. ShareAmerica. https://share.america.gov/know-someone-doesnt-internet-maybe-go-mooc-camp/

Udemy. 2021. Startpage (17 November 2021). https://www.udemy.com

Ulrich, Catalina, and Anca Nedelcu. (2015). Moocs in our university: Hopes and worries. Procedia Social and Behavioral Sciences. 180. 1541-1547. https://doi.org/10.1016/j.sbspro.2015.02.304

Wahid, Ratnaria, Azizuddin Mohd Sani, Bakri Mat, Muhammad Subhan, and Khaliza Saidin. (2015). Sharing works and copyright issues in massive open online courseware (MOOC). International Journal for Research in Emerging Science and Technology (IJREST). 2(10): 24-29.

Wei, W., Lihuan, G., Ling, H., & Yenchun, J. W. (2018). Effects of social interactive engagement on the dropout ratio in online learning: Insights from MOOC. Behavior & Information Technology, 38(6), 621-636. https://doi.org/10.1080/0144929X.2018.1549595

Wenger, E. (1998). Communities of practice: Learning as a social system. Systems Thinker, 9(5), 2-3.

Yue, N. W. S. (2022). Exploring Mooc as a New Instructional Technology Tool: The Relationship of Students' Challenges, Perceived Benefits and Satisfaction. Journal of Advanced Research in Applied Sciences and Engineering Technology, 1(28), 126-138. https://doi.org/10.37934/araset.28.1.126138

Zalli, M. M. M., Nordin, H., Hashim, R. A. (2019). The Role of Self-regulated Learning Strategies on Learners' Satisfaction in Massive Open Online Course (Mooc): Evidence from Malaysia MOOC. International Journal of Innovative Technology and Exploring Engineering, 10(8), 2286-2290. https://doi.org/10.35940/ijitee.j1138.0881019

Zhang, C., Chen, H., & Phang, C. W. (2018). Role of instructors' forum interactions with students in promoting MOOC continuance. Journal of Global Information Management (JGIM), 26(3), 105- 120.

Zhang, J., Gao, M., & Zhang, J. (2021). The learning behaviours of dropouts in MOOCs: A collective attention network perspective. Computers & Education, 167, 104189.

Zhang, K., Bonk, C. J., Reeves, T. C., & Reynolds, T. H. (Eds.). (2020). MOOCs and open education in the Global South: Challenges, successes, and opportunities. Routledge. https://doi.org/10.4324/9780429398919

Zhang, G., Kim, D. W., Qi, J., & Zhao, C. (2022, November 22). What factors influence MOOC course completion? An investigation of course completion and workplace benefits from interpersonal attraction theory perspective. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.1055108

Revolutionizing Learning: Leveraging Social Media Platforms for Empowering Open Educational Resources

Erny Arniza Ahmad1*
[1]*College of Computing, Informatics and Mathematics,*
Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
ernie579@uitm.edu.my
**Corresponding Author*

Received: 15 November 2024
Accepted: 25 December 2024
Date Published Online: 1 January 2024
Published: 1 January 2024

Abstract: *This study explores the realm of Social Media - Open Educational Resources (SM-OERs) and their impact on education. SM-OERs is a novel approach that combines open educational resources (OERs) with social media platforms. Their primary goal is to provide accessible and captivating educational materials, cultivating a dynamic learning environment. SM-OERs framework embraces social media as a tool to enhance learning, engagement, and growth. The benefits of SM-OERs include enhanced learner engagement, collaboration, and personalized learning. By using the interactive nature of social media, learners can access educational content in a way that suits their preferences and pace. The cost-effectiveness and accessibility of SM-OERs make quality education available to a wider audience, transcending geographical limitations. However, challenges arise with using SM-OERs in education. Concerns about privacy and data security emerge when integrating social media platforms in learning settings. Ensuring the credibility and quality of educational content shared via SM-OERs is crucial to uphold the learning process's integrity. Despite these challenges, SM-OERs hold promise for education's future. The interactive and collaborative aspects of social media foster peer-to-peer learning, building a sense of community among learners. SM-OERs also offer a budget-friendly approach to education, reducing the need for expensive infrastructure and learning systems. They can revolutionize*

education by creating inclusive and engaging learning environments. The study encourages further exploration into SM-OERs' usefulness, educators' perspectives, ethical considerations, and impact on collaborative learning communities. Educators can utilize SM-OERs to create meaningful learning experiences for digital-age learners by addressing challenges and leveraging opportunities.

Keywords: *Open Educational Resources, Social Media, Telegram, Connectivism Theory, Personalized Learning*

INTRODUCTION

In an era characterized by rapid technological advancement and evolving communication landscapes, the field of education is undergoing a profound metamorphosis. Traditional models of learning are being redefined and enriched by the integration of digital platforms and innovative pedagogies. At the forefront of this educational revolution lies the fusion of OERs with the ubiquitous influence of social media platforms.

Despites it values, the traditional educational landscape has long been accompanied by challenges that restrict access to quality education. Geographical limitations, financial constraints, and outdated instructional materials have acted as barriers to knowledge dissemination (Saiyad et al, 2020). In response to these challenges, the concept of OERs emerged as a promising solution. OERs encompass a vast array of digital materials, including textbooks, videos, interactive modules, and assessments, that are openly licensed and freely accessible to all (Truong et al, 2021; Dutta, 2016; Smith, 2013). This movement seeks to democratize education, allowing learners around the world to access high-quality learning resources without being confined by traditional classroom boundaries.

A growing body of literature has explored the intersection of social media and education, shedding light on the dynamic possibilities that emerge when these two spheres converge. Social media platforms have evolved from platforms of personal interaction to vibrant spaces for knowledge exchange, collaboration, and content creation. Researchers have investigated how these platforms can be harnessed for educational purposes, emphasizing their

potential to foster engagement, collaboration, and active learning among students (Purwonto et al, 2023; Van Den Beemt et al, 2020). Additionally, scholars have examined the alignment between the real-time and interactive nature of social media and modern learning preferences, highlighting its capacity to facilitate personalized and experiential learning (Ramzan et al, 2023, Alhumaid, 2020).

This study seeks to achieve several objectives. Firstly, it aims to explore how the integration of open educational resources with social media platforms can enhance the accessibility, engagement, and effectiveness of learning materials. Secondly, it identifies strategies and best practices for educators to leverage social media platforms to amplify the impact of OERs in diverse educational contexts. Finally, it addresses potential challenges, such as information quality, privacy, and digital literacy, that arise when utilizing social media platforms for educational purposes and proposes ways to mitigate them. This article seeks to shed light on these objectives to provide educators, researchers, and stakeholders with valuable insights into the transformative power of leveraging social media platforms to empower open educational resources.

2. MOTIVATION AND RATIONALE

Within the realm of digital innovation, the vast expanse of the internet offers a seemingly limitless repository of knowledge and information. However, this abundance of online content presents a double-edged sword for learners and educators alike. While access to information has never been easier, the challenge lies in navigating the vast sea of content to identify reliable, accurate, and relevant educational resources (Hettige et al, 2022). Additionally, the technical complexities that accompany digital learning environments, such as compatibility issues, platform diversity, and the need for digital literacy, can often hinder the seamless dissemination and consumption of educational materials (Kumar et al, 2021).

This confluence of challenges underscores the critical need for innovative solutions that enhance the accessibility, quality, and usability of online educational content (Truong et al, 2021). As educators and learners increasingly turn to digital resources to supplement traditional teaching

and learning methods, a compelling avenue for addressing these challenges emerges in the form of Social Media - Open Educational Resources (SM-OERs). SM-OERs represent a novel approach that harnesses the power of both open educational resources and social media platforms to create a transformative learning ecosystem.

The proliferation of online content has revolutionized learning, offering a treasure trove of educational materials. However, the lack of curation and quality assurance mechanisms often leads to information overload, making it difficult for learners to discern reliable sources from misinformation (Hettige et al, 2022). Moreover, technical issues arising from diverse learning management systems, file formats, and compatibility concerns can hinder the seamless adoption of digital learning resources (Kumar et al, 2021). These challenges collectively impede the realization of effective online learning experiences that cater to diverse learner needs.

In response to these challenges, SM-OERs emerge as a promising solution. By seamlessly integrating OERs with the dynamic capabilities of social media platforms, SM-OERs offer a holistic approach to addressing the shortcomings of traditional online learning. This synergistic fusion provides a platform for educators to curate, share, and collaborate on educational content, leveraging the interactive nature of social media to foster engagement, dialogue, and collective learning. SM-OERs hold the potential to not only bridge the gap between information availability and usability but also to cultivate a vibrant and participatory learning environment that transcends geographical boundaries.

3. CONNECTIVISM THEORY

The Connectivism Theory has gained considerable attention as a framework for understanding learning in the digital age. Siemens (2004) introduced the theory as an extension of existing learning theories, emphasizing the role of networks and digital technologies in shaping the learning process. Siemens argued that learners now navigate a complex web of information sources, necessitating skills in filtering, evaluating, and connecting information to construct knowledge. In line with this, researchers like Kop and Hill (2008) have explored the implications of Connectivism for education, highlighting

the need for educators to become orchestrators of learning environments that foster networked connections and empower students to take ownership of their learning journeys.

In a study by Veletsianos and Navarrete (2012), the application of Connectivism in online courses was investigated. The researchers found that the theory aligned well with the design of online learning environments, as it encouraged learners to explore diverse online resources, collaborate across platforms, and develop digital literacies. This sentiment was echoed by Bell (2011), who emphasized the importance of fostering digital citizenship and critical information evaluation skills within the context of Connectivism. However, critiques have emerged. Cleveland-Innes and Campbell (2012) noted that while Connectivism acknowledges the distributed nature of knowledge, it might not fully address the depth of learning that can arise from traditional, focused study. This highlights the ongoing debate around the theory's effectiveness in various educational contexts.

Connectivism Theory has emerged as a prominent lens through which to understand learning in the digital era. While its emphasis on networked connections and digital literacies offers valuable insights, researchers continue to explore its practical implications in diverse educational settings. The theory encourages educators to adapt their roles and teaching methodologies to facilitate meaningful networked learning experiences (Mackness et al., 2016), while also prompting learners to develop critical skills for navigating the information-rich digital landscape (Barnes, 2019).

4. LITERATURE REVIEW

The concept of OERs has gained considerable traction within the realm of education over the past few decades. OERs, as freely accessible educational materials that can be used, shared, and adapted by educators and learners, have become a focal point in discussions surrounding educational access, affordability, and collaboration. The movement was catalyzed by the advent of the internet, which enabled the wide dissemination of digital resources, ranging from textbooks and lecture notes to multimedia presentations and interactive modules. Researchers such as Hilton (2020) and Kumar et al (2021) have underscored the potential of OERs to democratize education

by breaking down financial barriers, granting learners access to quality materials regardless of economic status. The rise of OER repositories and platforms, like MIT OpenCourseWare and Khan Academy, has further demonstrated the global impact of OERs in fostering lifelong learning and enhancing educational equity.

As OERs have evolved, they have not only transformed access to educational materials but also prompted a shift in pedagogical practices. Dutta (2016) emphasizes the importance of OERs in empowering educators to tailor their teaching materials to meet specific learning objectives and cultural contexts. This customization enhances the relevance of learning materials and aligns with the principles of learner-centered education. Furthermore, OERs have led to the emergence of collaborative and participatory learning environments. Downes (2019) introduced the concept of "connectivism," suggesting that learners engage in networked learning by tapping into the collective knowledge available through OERs and online communities. This approach encourages active engagement, knowledge creation, and peer collaboration, reshaping traditional notions of education.

However, the adoption of OERs hasn't been without challenges. Tlili et. al (2023) points out concerns about the sustainability of OER initiatives, as they often rely on institutional funding and faculty participation. The issue of content quality and reliability has also been raised, as the openness of OERs can lead to variations in accuracy and credibility. Nevertheless, research and initiatives aimed at addressing these challenges, such as the development of quality assurance frameworks and faculty training programs, have contributed to a more nuanced understanding of OERs' potential and limitations. OERs reflects a growing recognition of their transformative impact on education, from enhancing access to fostering collaborative learning and redefining pedagogical paradigms.

The integration of social media platforms into educational contexts has garnered substantial attention due to the increasing prevalence of these platforms in daily life. Social media platforms, such as Facebook, Twitter, and Instagram, have evolved beyond personal communication tools to multifaceted environments where information sharing, networking, and collaboration are at the forefront. Researchers like Kumar et al (2021) have explored the potential of social media in higher education, highlighting its

capacity to facilitate student engagement, interaction, and communication both inside and outside the classroom. The interactive nature of these platforms enables educators to create dynamic learning environments where students can actively participate, ask questions, and share insights, fostering a sense of community and ownership over their learning experiences. Furthermore, the integration of multimedia elements, discussions, and real-time updates aligns with the principles of learner-centered education, accommodating diverse learning styles and preferences.

Social media platforms also offer educators unique avenues for extending the learning experience beyond traditional boundaries. Benenlier (2020) discusses the concept of "networked participatory scholarship," emphasizing how educators can use platforms like Twitter and blogs to connect with other professionals, share research findings, and engage in discussions that transcend geographical constraints. This expansion of learning communities offers opportunities for educators to stay current in their fields and contribute to a global discourse. Additionally, the collaborative and participatory nature of social media aligns with constructivist learning theories, as students can actively contribute to knowledge creation, engage in peer-to-peer learning, and co-construct meaning in collaborative projects. However, concerns about the potential for distraction, information overload, and privacy issues have also emerged in the literature, necessitating thoughtful strategies for leveraging social media effectively in educational settings.

While the integration of social media platforms in education is still a relatively nascent field, research consistently highlights its potential to enhance engagement, communication, and collaboration among students and educators. The utilization of these platforms aligns with the evolving landscape of digital communication and offers educators a dynamic toolset to craft innovative learning experiences that cater to the preferences and learning needs of today's digital-native learners.

The convergence of OERs and social media platforms represents a dynamic and evolving intersection within the educational landscape. Researchers have recognized the potential synergy between these two domains as a means to enhance educational access, engagement, and collaboration. Kumar et al (2021) suggests that the marriage of OERs with social media platforms could foster a participatory culture of learning, where learners become

active contributors to knowledge creation and dissemination. This notion resonates with the principles of constructivist pedagogy, as social media's interactive and collaborative features align with the idea of learners as active co-creators of knowledge. Furthermore, the integration of OERs into social media platforms extends the accessibility of educational materials, as learners can access and engage with resources directly within familiar online spaces, transcending barriers related to distance and availability.

Social media platforms offer a unique context for the exploration and dissemination of OERs. Researchers like Benenlier (2020) discuss the concept of "open scholarship," where educators and learners share their work, ideas, and resources openly on social media platforms. This open sharing aligns with the ethos of OERs, as educators use social media to curate, share, and discuss freely accessible educational content. The informality and immediacy of platforms like Twitter enable educators to engage in ongoing professional development, participate in global education conversations, and expand their professional networks. However, the literature also highlights concerns about the credibility of information shared on social media platforms and the need for critical media literacy skills among learners to navigate these spaces effectively.

The literature emphasizes the potential of combining OERs and social media platforms to foster collaborative, participatory, and accessible learning environments. The integration of OERs within the interactive landscape of social media aligns with contemporary pedagogical paradigms that emphasize learner engagement, active participation, and the co-creation of knowledge. While challenges related to information credibility and digital literacy must be addressed, the evolving relationship between OERs and social media holds promise for reshaping educational practices and empowering learners and educators in the digital age.

5. SOCIAL MEDIA - OPEN EDUCATIONAL RESOURCES (SM-OERS)

This study explores the realm of Social Media - Open Educational Resources (SM-OERs) and their far-reaching implications in the field of education. SM-OERs, represent a contemporary approach to learning and resource sharing

that combines the principles of OERs with the collaborative and networked nature of social media platforms. OERs are freely accessible educational materials that can be used, shared, and adapted by educators and learners, fostering a culture of open knowledge exchange. Social media platforms, on the other hand, enable individuals to connect, communicate, and collaborate in virtual spaces, creating a dynamic environment for knowledge creation and dissemination. The integration of SM-OERs into education highlights the principles of Connectivism theory, which emphasizes the significance of networks, digital literacies, and learning as a distributed process.

Connectivism theory, as introduced by Siemens (2004), posits that learning is not confined to individual minds, but rather emerges from the connections formed between people, resources, and technology within networks. SM-OERs align with this perspective by leveraging the power of social media platforms to create vast networks of learners, educators, and resources. Learners engage in collaborative knowledge building, where they curate, remix, and share open educational content through social media channels, contributing to the collective intelligence of the network. This process resonates with Connectivism's emphasis on learning through the act of connecting information nodes, as learners navigate through diverse perspectives, engage in discussions, and co-create new understandings.

Furthermore, Connectivism underscores the importance of digital literacies, which encompass skills in evaluating, interpreting, and utilizing digital information effectively. SM-OERs require learners to develop these literacies as they navigate the ever-expanding landscape of online content and discern credible sources amidst a plethora of information. Social media platforms demand critical thinking and discernment, mirroring Connectivism's emphasis on the ability to filter information and make informed decisions about the value and relevance of different resources.
SM-OERs embody the principles of Connectivism theory in education by embracing the networked nature of learning and promoting digital literacies. Through the integration of social media platforms with OERs, learners are empowered to connect, collaborate, and co-create knowledge within dynamic virtual networks. This convergence of concepts offers an innovative approach to learning that reflects the realities of the digital age, where meaningful engagement with information occurs through connections, collaboration, and critical evaluation.

Central to the objectives of SM-OERs is the aspiration to revolutionize learning into a dynamic, simplified, and enjoyable endeavour for all learners. This transformation is realized by reimagining OERs as Self-Instructional Materials (SIMs), ushering in an era of self-directed learning. By tailoring content to suit individual preferences and needs, SM-OERs empower learners to chart their own learning paths, at their own pace and convenience, thereby promoting flexibility and a culture of lifelong learning. Moreover, the integration of interactive exercises throughout the learning materials, encompassing pre-learning, in-learning, and post-learning activities, serves as a catalyst for heightened student engagement and a deeper grasp of the subject matter.

5.1 THE FRAMEWORK FOR SM-OERS

The SM-OERs Framework as shown in Fig 1 introduces a fresh and innovative approach to the world of education, seamlessly blending the power of social media with the wealth of OERs. Imagine it as a bridge connecting two vital components of modern learning which are the interactive and engaging nature of social media platforms and the vast repository of freely accessible educational materials. In simpler terms, it's like merging the best of both worlds to create an ecosystem that not only enhances learning but also empowers learners.

The utilisation of social media platforms, such as Telegram, is maximised as effective channels for educational purposes. Instead of just being platforms for personal chats, they become avenues for sharing, discussing, and collaborating on educational content. Learners can access high-quality learning materials like videos, articles, and quizzes through OERs, which are readily available for free. This means that the learning process becomes more interactive and engaging, as students can ask questions, share insights, and even collaborate on projects through these social media channels. Moreover, the simplicity and popularity of these platforms make learning more accessible to a wider audience, transcending geographical boundaries and making education a global endeavour.

The core objective of the SM-OERs Framework is to revolutionize how we learn. By making educational content available on social media platforms through OERs, the framework aims to create a learning environment that's not confined to classrooms or traditional methods. It's about making learning a continuous and interactive journey where students can learn at their own pace, ask questions, and collaborate with peers and educators beyond the confines of a physical classroom. In essence, the SM-OERs Framework is all about leveraging technology and the power of social connection to make education more inclusive, engaging, and self-directed.

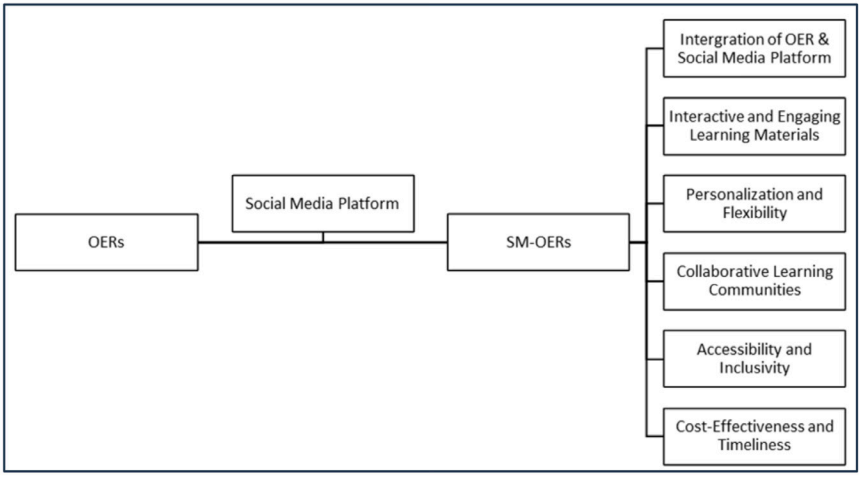


Fig. 1 The SM-OERs Framework

The SM-OERs Framework is an intricate structure composed of various essential elements, each carefully crafted with the intention of revolutionising the field of education. Central to this framework is the seamless fusion of OERs with the dynamic ability of social media platforms. Telegram, serving as a conduit of transformation, propels educational content sharing, learner engagement, and collaboration to new heights. This integration capitalizes on the immense popularity and connectivity that social media platforms offer, enabling educators to extend their reach, enhance learner engagement, and establish a vibrant educational community.

An integral facet of SM-OERs lies in the crafting of interactive and captivating learning materials. Transmuting conventional OERs into Self-Instructional Materials (SIMs), this approach immerses learners in a world of personalized and self-directed exploration. These SIMs incorporate multimedia elements, interactive exercises, quizzes, and other engaging components, thus fostering a participatory learning experience that amplifies comprehension and enthusiasm.

At the heart of the SM-OERs Framework is a commitment to personalization and flexibility, granting learners the agency to forge their distinctive paths. By affording learners the autonomy to dictate their learning trajectory, timeframes, and methodologies, SM-OERs embrace the diverse spectrum of learning styles and preferences. Moreover, this framework catalyzes collaborative learning communities, facilitated by platforms like Telegram, where learners unite in vibrant discussions, resource sharing, and mutual support, thus forging a tapestry of interconnectedness and camaraderie.

As accessibility and inclusivity ascend as imperatives in education, SM-OERs respond with resounding solutions. By harnessing cloud storage and offering offline access, educational content defies geographic constraints and extends its reach to remote corners. Embracing the principles of Universal Design Learning, SM-OERs welcome learners of all backgrounds and abilities, ensuring that education truly knows no boundaries.

Nestled within the folds of the SM-OERs Framework is an inherent promise of cost-effectiveness and timeliness. The leverage of social media platforms negates the demand for intricate infrastructures, rendering education more financially viable. Furthermore, the swift distribution of educational content across social media ensures its currency and relevance, enabling educators to promptly infuse freshness into the learning experience. Together, these elements create a vibrant depiction that signifies the emergence of a novel epoch in education, characterised by inclusivity, active participation, and the harmonious integration of technology and instructional methods.

5.2 THE IMPLEMENTATION OF SM-OERS

This section will describe the application of the SM-OERs Framework on the Telegram platform, showcasing a dynamic fusion of innovation and accessibility that is transforming the educational scene beyond conventional limitations.

5.2.1 INTEGRATION OF OERS WITH TELEGRAM

Central to the execution of this approach is the elegant fusion of OERs with the versatile Telegram platform. Telegram, celebrated for its intuitive interface and real-time communication capabilities, evolves into a vibrant channel for educators to seamlessly interact with educational content. As educators navigate this transformed landscape, they find a dynamic conduit to share, discuss, and collaboratively shape educational materials. This shift revolutionizes the way educators and learners connect, transforming the platform from a simple messaging tool into a thriving educational ecosystem.

Within this reimagined Telegram environment, educational resources blossom into a diverse array of multimedia presentations, insightful articles, and other engaging content. These resources, meticulously selected to cater to varied learning styles, are effortlessly shared within Telegram channels or groups. The result is an environment brimming with accessible educational content that learners can explore at their own convenience. The beauty of this integration lies in its simplicity. This is where the learners are no longer needed to navigate multiple platforms or search extensively. The educational materials are now a seamless part of their Telegram experience which as intuitive as sending a message.

This integration offers a seamless bridge between educational content and a platform renowned for its popularity and connectivity. Learners are empowered to engage with materials while embracing the familiar user-friendly environment Telegram

provides. The implications of this convergence are profound; education transcends boundaries, connecting learners and educators through real-time discussions and collaborative ventures. As the dynamic educational content populates Telegram channels and groups, learners find themselves immersed in an accessible, engaging learning experience that melds seamlessly with their digital routines.

5.2.2 INTERACTIVE LEARNING MATERIALS

Within the Telegram platform, the conventional notion of OERs undergoes a metamorphosis, emerging as vibrant and interactive Self-Instructional Materials (SIMs). These SIMs are a symphony of multimedia elements, ranging from videos that elucidate complex concepts to images that paint a visual narrative. Accompanying these visuals are exercises that challenge learners' understanding, quizzes that gauge their comprehension, and interactive components that beckon exploration. This infusion of multimedia transforms learning into an immersive experience where text, visuals, and interactivity converge to illuminate subjects from multiple angles.

As learners engage with these SIMs, they embark on an active exploration, where the act of clicking, swiping, and responding brings learning to life. This interactivity transcends the traditional boundaries of learning materials, sparking critical thinking, problem-solving, and deeper analysis. Learners evolve from passive recipients to active participants in their learning journey. The process of interaction cultivates a sense of agency and empowerment, propelling learners to venture deeper into subjects, driven by a curiosity awakened through their own actions.

The significance of this interactivity extends beyond comprehension; it invigorates engagement and participation. Learners become co-creators, shaping their educational experience through exploration and response. The dynamic dialogue between learner

and content mirrors the fluid exchanges on social media platforms, bridging the gap between traditional learning and contemporary communication. This fosters a unique connection that transforms learners into collaborators in their education, breathing life into subjects and making learning an invigorating, dynamic journey.

5.2.3 PERSONALIZATION AND FLEXIBILITY

In the realm of education, Telegram evolves into a vibrant channel for educators to seamlessly interact with educational content while embracing the principles of personalization and flexibility. As educators navigate through this transformed landscape, they discover a dynamic conduit that allows them to not only share and discuss but also collaboratively tailor educational materials according to individualized learning needs. This transformation revolutionizes the way educators and learners connect, elevating the platform beyond a mere messaging tool to a thriving educational ecosystem that underscores the significance of personal learning journeys.

Within this reimagined Telegram environment, SM-OERs bloom into a diverse array of multimedia presentations, insightful articles, and other engaging content, all geared towards catering to various learning styles. These resources, thoughtfully curated for personalized learning experiences, are seamlessly shared within Telegram channels or groups. The outcome is an enriched environment brimming with easily accessible educational content, empowering learners to explore and engage at their own pace and convenience. The brilliance of this integration lies in its simplicity, where learners are no longer need to traverse multiple platforms or conduct extensive searches; instead, educational materials become an integral and intuitive aspect of their Telegram interactions, providing a highly flexible and tailored learning journey.

This innovative integration not only bridges the gap between educational content and a platform known for its popularity and connectivity but also empowers learners to engage with materials on their terms. Telegram's user-friendly environment, coupled with the personalized nature of SM-OERs, fosters an environment where learners are at the forefront of their learning experience. The implications of this convergence are profound; education transcends boundaries, connecting learners and educators through real-time discussions and collaborative endeavours that are uniquely attuned to each learner's preferences. As the Telegram channels and groups become populated with dynamic educational content, learners find themselves immersed in a highly personalized and flexible learning journey that seamlessly integrates into their digital routines.

5.2.4 COLLABORATIVE LEARNING COMMUNITIES

Collaborative Learning Communities thrive through Telegram's group and discussion features, offering a dynamic stage for the integration of SM-OERs within this context. Telegram's group and discussion features unfold their inherent power, fostering environments where learners set out on a shared expedition of exploration and knowledge co-creation. Within these digital domains, learners convene to actively engage in group discussions where dialogues effortlessly transcend boundaries, merging diverse viewpoints into insightful conversations. Through active involvement, learners not only contribute their unique perspectives but also reap the rewards of collective wisdom garnered from their peers. The fusion of varied ideas, opinions, and perspectives gives rise to an intellectual ecosystem, expanding the boundaries of comprehension and dissecting subject intricacies from a multitude of angles.

This spirit of collaboration extends to the exchange of insights, a transformative process that turns learners into both contributors and beneficiaries. As learners share their individual viewpoints,

they lay the foundation for a rich tapestry of understanding that transcends the limitations of individual perspectives. This exchange goes beyond mere content, stepping into the domain of experiential learning, where the nuances of subjects come alive through real-world observations. This communal exchange of insights, interwoven with the diverse fabric of learners' experiences, sparks a spirit of shared inquiry and mutual learning, infusing vitality into the learning experience.

By harnessing Telegram's interactive and communicative capabilities, collaborative learning communities evolve into vibrant hubs of intellectual interchange. Real-time discussions empower learners to ask questions, seek clarifications, and propose solutions, fostering an environment where curiosity thrives and collective problem-solving conquers obstacles. The dynamic nature of these interactions nurture collaboration and shared learning objectives, transforming learners from isolated individuals into active contributors within a connected community. This web of interconnection ignites a sense of accountability, motivating learners to support each other's learning journeys and jointly shape a repository of insights that enriches the entire community.

5.2.5 ACCESSIBILITY AND INCLUSIVITY

Looking into the context of accessibility and inclusivity, Telegram emerges as a beacon of empowerment, erasing geographic boundaries and levelling the educational playing field. At the heart of this transformation lies Telegram's robust cloud storage and offline access capabilities, which assume a pivotal role in democratizing education. Learners, irrespective of their location or internet connectivity limitations, find themselves empowered to access educational content through Telegram's innovative offline mode. This ability transcends mere convenience; it is a testament to the power of technology to bridge gaps and ensure that education remains within reach for learners in even the most remote corners of the world.

The significance of this inclusion cannot be overstated, as it aligns seamlessly with the ethos of the SM-OERs Framework. By affording learners the ability to engage with educational content regardless of their internet connectivity status, Telegram champions the framework's mission to break down barriers to education. Remote areas, which were once constrained by lack of connectivity, now find themselves integrated into the broader educational narrative. This integration ignites a ripple effect of transformation, unlocking potential and fostering a sense of empowerment among learners who might otherwise have been marginalized by technological limitations.

The efficacy of Telegram's role in accessibility lies in its simplicity and impact. Learners don't need to possess cutting-edge technology or a constant internet connection to partake in education. This approach doesn't just ensure accessibility; it champions the principle that education should be a universal right, not a privilege. Telegram's contribution to accessibility extends beyond providing content; it provides a pathway for learners to participate, engage, and elevate their understanding, no matter where they are located. In essence, Telegram's cloud storage and offline access capabilities transcend technology; they symbolize an embrace of the diverse, a commitment to the underserved, and an embodiment of the spirit of inclusive education.

5.2.6 COST-EFFECTIVENESS AND TIMELINESS

At the crossroads of cost-effectiveness and timeliness, the Telegram platform emerges as an exemplar of efficient education delivery that resonates with the core tenets of the SM-OERs Framework. Through its widespread adoption, Telegram becomes a catalyst for redefining educational content dissemination by negating the need for complex and costly infrastructures. This shift has far-reaching implications where the financial burden associated with setting up elaborate learning management systems is replaced with an accessible, economical alternative. By minimizing overhead costs, Telegram's role in education

extends beyond content sharing; it advocates for resource optimization and the democratization of education.

The real-time communication capabilities of Telegram serve as a cornerstone in the realm of timeliness. Educators are empowered with the ability to promptly share updates, new insights, and fresh content, ensuring that the learning experience remains at the cutting edge of relevance. This real-time exchange of information aligns seamlessly with the fast-paced digital era, where information evolves at rapid speeds. Learners, through the Telegram platform, find themselves on the forefront of knowledge, their learning journey enhanced by the constant infusion of current insights. This timeliness breathes life into education, bridging the gap between theoretical concepts and real-world advancements.

The Telegram platform's dual role in cost-effectiveness and timeliness doesn't merely provide a solution to financial constraints; it underpins a new era of educational accessibility. Learners and educators alike find themselves on a platform that champions efficient content sharing while staying aligned with the pulse of evolving information. This integration catalyzes a transformative shift, rendering education dynamic, financially feasible, and aligned with the pace of the modern world. Within this context, Telegram serves a purpose beyond its role as a mere channel for information transmission. Instead, it signifies the emergence of a more comprehensive, efficient, and pertinent educational environment.

6. CHALLENGES AND SOLUTIONS IN SM-OERS IMPLEMENTATION PROCESS

The integration of social media platforms into educational settings presents a plethora of exciting opportunities for engaging learners and expanding the horizons of learning (Greenhow, 2016). However, this approach is not devoid of challenges, and it's crucial to address these potential pitfalls to ensure a safe, effective, and enriching educational experience.

One of the most pressing concerns is the quality of information available on social media. The vast volume of content circulating on these platforms makes it difficult to ascertain the accuracy and reliability of educational materials (Meel & Vishwakarma, 2020). To overcome this challenge, educators should take on the role of curators, guiding learners towards credible sources and promoting critical thinking (Sawyer et al., 2020). Teaching students how to discern trustworthy information from misinformation is vital in an age of digital overload. By providing guidance on evaluating sources and encouraging scepticism, educators can empower learners to navigate the sea of information with discernment (Head et al, 2020).

Privacy is another key challenge. Social media platforms are designed for open communication and sharing, which can inadvertently expose learners' personal information (Ahmad et al, 2019). In an educational context, where privacy and data protection are paramount, educators and institutions need to educate learners about privacy settings, data security, and responsible sharing. Establishing clear guidelines and fostering a culture of responsible digital behavior can create an environment where learners feel safe to engage and collaborate without compromising their privacy.

Digital literacy is an essential skillset that cannot be overlooked when leveraging social media for education. While many learners are adept at using social media for personal purposes, not all possess the necessary digital literacy skills to navigate educational spaces responsibly. Incorporating digital literacy education into curricula equips learners with the skills to evaluate online content, distinguish credible sources, and manage their digital footprints (Milenkova & Lendzhova, 2021). Furthermore, educators can guide students on ethical online behavior, encouraging respectful and responsible interactions within the digital realm.

To address these challenges, collaboration between educators, institutions, and social media platform providers is crucial. Platforms can offer dedicated educational spaces with enhanced privacy settings and improved tools for content curation. Educators, in turn, can create guidelines and codes of conduct that promote ethical behavior and ensure the safe use of these platforms for learning. By working together, stakeholders can establish a framework that harnesses the benefits of social media while mitigating potential risks.

The integration of social media platforms into education has the potential to revolutionize learning, but it is essential to navigate challenges effectively (Peimani & Kamalipour, 2021). Educators must guide learners in evaluating information, prioritize privacy and data security, foster digital literacy, and collaborate with platform providers. By doing so, we can harness the power of social media to create dynamic, engaging, and secure educational environments that empower learners to thrive in the digital age.

CONCLUSION

In conclusion, this article has undertaken a comprehensive exploration of the transformative potential embedded within the integration of OERs with social media platforms, encapsulated within the framework of SM-OERs. Through the lens of SM-OERs, we have achieved the objectives set forth at the inception of this study, shedding light on the profound impact that this innovative approach holds for education.

Through an exploration of the interplay between OERs and social media, we have uncovered the potential of SM-OERs to significantly transform the landscape of education. Our investigation has revealed that the seamless convergence of these two spheres can render learning materials more accessible, engaging, and effective. Learners, regardless of geographical location, can access a wealth of educational content through the dynamic channels of social media platforms. The empowerment that SM-OERs offers extends beyond mere access; it nurtures engagement, collaboration, and personalized learning experiences, fostering a vibrant educational ecosystem.

In addressing our objectives, we have outlined strategies for educators to harness the power of social media platforms, extending the reach and impact of OERs. The establishment of collaborative learning communities, the creation of interactive and engaging learning materials, and the cultivation of personalized and flexible learning paths stand as testament to the rich potential of SM-OERs. However, we have also acknowledged the challenges posed by information quality, privacy concerns, and digital literacy gaps. Through our exploration, we have underscored the importance of critical thinking, responsible behaviour, and educational initiatives aimed at enhancing digital literacy.

As we navigate the landscape of education's future, SM-OERs emerges not merely as an approach but as a catalyst for a holistic transformation. By leveraging the power of social media platforms, educators, learners, and stakeholders can collectively shape an educational environment that is inclusive, engaging, and responsive to the evolving needs of the digital era. The fusion of OERs with the communicative and interactive capabilities of social media platforms is a paradigm shift that demands the thoughtful integration of strategies and the diligent pursuit of mitigative measures. In the end, our journey through this exploration reaffirms the potential of SM-OERs to shape a new era of education that is both empowered by technology and rooted in the principles of accessibility, engagement, and enriched learning experiences.

REFERENCES

Ahmad, N., Arifin, A., Asma'Mokhtar, U., Hood, Z., Tiun, S., & Jambari, D. I. (2019). Parental awareness on cyber threats using social media. Jurnal Komunikasi: Malaysian Journal of Communication, 35(2), 485-498.

Alhumaid, K. F. (2020). Qualitative evaluation: Effectiveness of utilizing digital and social media in education. Utopía y Praxis Latinoamericana, 25(6), 466-476.

Barnes, C. (2019). Connectivism and the Networked Student: A Framework for Online Learning in Higher Education. In M. A. Peters (Ed.), Encyclopedia of Educational Philosophy and Theory. Springer.

Bell, F. (2011). Connectivism: Its place in theory-informed research and innovation in technology-enabled learning. International Review of Research in Open and Distributed Learning, 12(3), 98-118.

Cleveland-Innes, M., & Campbell, P. (2012). Emotional presence, learning, and the online learning environment. The International Review of Research in Open and Distributed Learning, 13(4), 269-292.

Downes, S. (2019). Recent work in connectivism. European Journal of Open, Distance and E-Learning (EURODL), 22(2), 113-132.

Dutta, I. (2016). Open Educational Resources (OER): Opportunities and challenges for Indian higher education. Turkish Online Journal of Distance Education, 17(2).

Greenhow, C., & Gleason, B. (2014). Social scholarship: Reconsidering scholarly practices in the age of social media. British journal of educational technology, 45(3), 392-402.

Head, A. J., Fister, B., & MacMillan, M. (2020). Information Literacy in the Age of Algorithms: Student Experiences with News and Information, and the Need for Change. Project Information Literacy.

Hettige, S., Dasanayaka, E., & Ediriweera, D. S. (2022). Student usage of open educational resources and social media at a Sri Lanka Medical School. BMC medical education, 22, 1-11.

Hilton III, J. (2020). Open educational resources, student efficacy, and user perceptions: A synthesis of research published between 2015 and 2018. Educational Technology Research and Development, 68(3), 853-876.

Kop, R., & Hill, A. (2008). Connectivism: Learning theory of the future or vestige of the past? International Review of Research in Open and Distance Learning, 9(3).

Kumar, K. S., Mahendraprabu, M., Kalaiyarasan, G., Ramnath, R. R., & Kumar, N. S. (2021). Social Media as an Open Educational Practice Tools and Challenges. Library Philosophy and Practise (e-journal). 5265

Mackness, J., Waite, M., Roberts, G., & Lovegrove, E. (2016). Learning in a small, task–oriented, connectivist MOOC: Pedagogical issues and implications for higher education. The International Review of Research in Open and Distributed Learning, 17(3).

Meel, P., & Vishwakarma, D. K. (2020). Fake news, rumor, information pollution in social media and web: A contemporary survey of state-of-the-arts, challenges and opportunities. Expert Systems with Applications, 153, 112986.

Milenkova, V., & Lendzhova, V. (2021). Digital citizenship and digital literacy in the conditions of social crisis. Computers, 10(4), 40.

Peimani, N., & Kamalipour, H. (2021). Online education and the COVID-19 outbreak: A case study of online teaching during lockdown. Education Sciences, 11(2), 72.

Purwanto, A., Fahmi, K., & Cahyono, Y. (2023). The Benefits of Using Social Media in the Learning Process of Students in the Digital Literacy Era and the Education 4.0 Era. Journal of Information Systems and Management (JISMA), 2(2), 1-7.

Ramzan, M., Javaid, Z. K., & Fatima, M. (2023). Empowering ESL Students: Harnessing the Potential of Social Media to Enhance Academic Motivation in Higher Education. Global Digital & Print Media Review, VI (II), 224-237.

Saiyad, S., Virk, A., Mahajan, R., & Singh, T. (2020). Online teaching in medical training: Establishing good online teaching practices from cumulative experience. International Journal Of Applied And Basic Medical Research, 10(3), 149.

Sawyer, A. G., Dredger, K., Myers, J., Barnes, S., Wilson, R., Sullivan, J., & Sawyer, D. (2020). Developing teachers as critical curators: Investigating elementary preservice teachers' inspirations for lesson planning. Journal of Teacher Education, 71(5), 518-536.

Siemens, G. (2004). Connectivism: A learning theory for the digital age. International Journal of Instructional Technology and Distance Learning, 2(1), 3-10.

Smith, M. S. (2013). Open Educational Resources: Opportunities and challenges for the developing world. Open development: Networked innovations in international development, 129-170.

Tlili, A., Nascimbeni, F., Burgos, D., Zhang, X., Huang, R., & Chang, T. W. (2023). The evolution of sustainability models for Open Educational Resources: Insights from the literature and experts. Interactive Learning Environments, 31(3), 1421-1436.

Truong, V., Denison, T., & Stracke, C. M. (2021). Developing institutional open educational resource repositories in Vietnam: Opportunities and challenges. International Review of Research in Open and Distributed Learning, 22(4), 109-124.

Van Den Beemt, A., Thurlings, M., & Willems, M. (2020). Towards an understanding of social media use in the classroom: a literature review. Technology, Pedagogy and Education, 29(1), 35-55.

Veletsianos, G., & Navarrete, C. C. (2012). Online social networks as formal learning environments: Learner experiences and activities. The International Review of Research in Open and Distributed Learning, 13(1), 144-166.

Zawacki-Richter, O., Conrad, D., Bozkurt, A., Aydin, C. H., Bedenlier, S., Jung, I., ... & Kerres, M. (2020). Elements of open education: An invitation to future research. International Review of Research in Open and Distributed Learning, 21(3), 319-334.

Students' Academic Performance by Using E-Learning as a Method of Teaching and Learning

Mohd Faizul Hassan[1*], Naffisah Mohd Hassan[2]
[1]Faculty of Business and Management, Universiti Teknologi MARA, Cawangan Selangor, Kampus Puncak Alam, Malaysia
**faizulhassan@ uitm.edu.my*
[2]Faculty of Business and Management, Universiti Teknologi MARA, Cawangan Selangor, Kampus Puncak Alam, Malaysia naffi885@uitm.edu.my
**Corresponding Author*

Received: 15 November 2024
Accepted: 25 December 2024
Date Published Online: 1 January 2024
Published: 1 January 2024

Abstract: *E-learning is being implemented in higher educational institutions as a method of teaching and learning. Several studies have been carried out on academic performance, particularly on a group of conventional students. However, only a few have been written on E-learning among PJJ students' academic performance in E-learning technology. This study was conducted to determine and investigate the relationship between Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) towards Attitude (ATT) and Actual Use (AU) as a factor of Students' Academic Performance towards e- learning technology among students of the business management faculty enrolled in BA232 Bachelor in Office Systems Management (Hons) at UiTM Puncak Alam. This study took a quantitative and stratified sampling approach with 155 respondents. Statistical methods analyses used were multiple regression and logistic regression. Actual Use (AU), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude (ATT), and Actual Use (AU) are significant as the p-values are smaller than = 0.05. E-learning use had a significant influence on students' academic performance. Thus, the more the students use E-learning, the better their academic performance. This study would benefit online institutions, online / distance instructors, decision-makers at all higher education levels, and online students. The*

implications for practices, barriers to e-learning, ongoing support by the government, limitations of the study and recommendations for research were discussed.

Keywords: *Actual Use (AU), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude (ATT) and Actual Use (AU)*

INTRODUCTION

Electronic learning (E-learning) has become an alternative method of learning. Further, it has become more prevalent in higher educational institutions due to the growth and evolution of Internet technologies. The concept of E-learning is based on using information and communication technology (ICT) such as the internet, mobile phones, and computers to enhance and facilitate the teaching and learning process. Apart from that, E-learning also enables humans to share all kinds of materials, such as slideshows, Word documents, PDFs, and live online classes and forums. It is noted that e-learning is a unifying term used to describe the fields of online learning, web-based training, and technology- delivered instructions (N. D. Oye et al., 2012). E-learning has been implemented in many universities and thus far has impacted students' performance as a method of learning besides using traditional face- to-face methods. E-learning is becoming increasingly accepted around the world these days, as it uses technology and social media to offer education (Aljawarneh, 2020; Hong et al., 2017). E-learning models began as mere replications of classroom instruction but have evolved to those that integrate technology and pedagogy.

Early models, such as the Demand-Driven model (MacDonald, et al, 2001) focused on the role of technology in providing content, access, and electronic services. Soon after, information and technology's rapid development and commercialization impacted E-learning implementation and beyond. Moreover, E-learning implementation in higher educational institutions has granted greater access or autonomy, allowing students to learn at any given time and place. In Malaysia's higher educational institutions, the growth of E-learning has developed over the past few years as it offers many advantages and benefits for improving students' performance. In this regard, many studies have

been conducted to identify the key factors contributing to the student's performance, except for the relationship between E-learning and students' academic performance. Hence, this study is imperative to be carried out to examine the relationship between E-learning and the student's academic performance at UiTM.

It is observed that, currently, the rapid growth of ICT has affected all sectors in Malaysia, including education. The education sector has evolved from a single learning method, i.e., face-to-face, to various methods, such as E-learning. Be that as it may, there is still much to discover about E- learning, especially blended learning in institutions and teachers' education establishments. E-learning as a modern strategy for teaching and learning is multi-dimensional and dynamic, changing according to context, circumstances, and interests.

E-learning is being implemented in higher educational institutions as a method of teaching and learning. Several studies have been carried out on academic performance, particularly on a group of conventional students, but only a few on e-learning among PJJ students in UiTM. Limited studies have been done on the factors influencing students' academic performance in E-learning technology. This statement follows the finding that shows the significant relationship as stated (Kunhi Mohamed, 2012). Further, this statement is also similar to that of Rodgers (2008) where online interaction has a positive and statistically significant impact on the student's academic performance. Thus, this study will focus on factors influencing the E-learning system and the acceptance of technology by students' academic performance. This research will also only focus on e-PJJ students, where the findings can help improve E- learning in UiTM, especially that of e-PJJ students. Therefore, this study and its findings are crucial and beneficial in the long run, where E-learning is seen to be comparatively better and more cost-effective than the traditional method of learning (face-to-face). The paper is organized into different sections. Section 2 reviews the literature of past related studies and develops the hypotheses. Section 3 explains the research methodology. Section 4 presents the analysis and the research findings and discusses the implications. Finally, Section 5 provides the conclusions and recommendations for future research.

2. LITERATURE REVIEW

This section reviews the related literature on e-learning and discusses past studies for hypothesis development. In recent years, ICT has dramatically influenced the transmission of knowledge. This has also influenced the present methods of teaching and learning. Computers and digital technologies have enhanced the competence of contemporary teaching and learning methods. An educational transition has occurred towards e-learning, facilitating the utilization of information and communications technology and integrating the Internet into the realm of teaching and learning.

Furthermore, E-learning enriches learning by presenting an alternative approach to delivering adaptable and user-friendly education. The learning environment has evolved from the traditional face- to-face classroom to online. Numerous institutions of Higher Education (HEIs) have embraced e- learning for online courses or to complement in-person sessions (within a blended learning framework). From another perspective, e-learning is an advancement of technology in learning, as well electronical delivery or training. It is worth noting that E-learning has become similar to the flexible education method, which can be conducted anytime, anywhere, and by anyone.

Generally, there are many definitions of E-learning from the previous study as (Clark & Mayer, 2016) where it is stated that "Definition of E-learning" is a method where instruction is delivered by a digital device such as a computer or mobile that supports learning".

A Cumulative Grade Point (CGPA) refers to the student's average grade for all semesters, whilst the Grade Point (GPA) may refer to only the current semester or term. Based on this finding, the researcher may forecast the expected relationship between E-learning and students' academic performance. Madar & Ibrahim (2011) finds that there is a very strong relationship between students' GPA and their participation in the discussion forum where $r = 0.821$ has concluded that the more the students use E-Learning, the better their academic performance.

On the other hand, recent studies suggest that students experience stress due to online learning and prefer in-person instruction (Chakraborty et al., 2021;

Fawaz & Samaha, 2021). As a result, students' academic achievements have decreased, causing their academic performance to deteriorate. Perceived Usefulness is a crucial driver of usage behaviour and intention. Perceived Usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her performance" (Davis, 1989) as E-learning allows the flexibility of learning at any time and place. N. D. Oye, Iahad, et al., (2012) indicate that the perceived use of E-learning significantly affects the attitude towards using E-learning.

In the e-learning context, prior research demonstrates a significant effect of perceived usefulness towards use. The finding is also supported by Al-Adwan et al., (2013), who indicated that perceived usefulness (PU) has significantly influenced Actual Use (AU) ($p<0.05$). (Johari et al., 2015) It has also been indicated in previous studies that PU has significantly influenced the intention to use (ITU) ($P<0.05$). On top of that, perceived usefulness has a significant relationship with attitude, which aligns with the findings (Abdullah & Toycan, 2017; Fathema et al., 2015) On this basis, the researchers propose the following hypothesis 2: Perceived Usefulness (PU) has a significant effect on Attitude (ATT) and hypothesis 4. Perceived Usefulness (PU) significantly affects Actual Use (AU). Perceived Ease of Use is the degree to which a person believes that using a particular system would be free from effort (Davis, 1989). A research by Ho Cheong & Park, (2005) have found that Perceived Ease of Use influenced students' intention to use internet-based learning indirectly through Perceived Usefulness and Perceived Enjoyment (Gong et al., 2004) Also, it has been found that Perceived Ease of Use has a significant effect on students' attitudes and Perceived Usefulness simultaneously. Perceived Ease of Use's effect on Perceived Usefulness is postulated by the Technology Acceptance Model (TAM). This finding can be supported by Adewole-Odeshi, (2014) where it is stated that there is a significant relationship between Perceived Ease of Use and students' attitudes towards E-learning. From another perspective, Perceived Ease of Use (PEOU) has a significant influence on attitude towards Use (ATU) ($P<0.01$). Based on another study conducted by Kumar & Johari (2015) it has been indicated that PEOU significantly influences the attitude of students (ATU) and this aligns with a study conducted by Gill et al., (2020). On this basis, the researcher proposes the following hypothesis 1, Perceived Ease of Use (PEOU) has a significant effect on the Attitude (ATT) and hypothesis 3, Perceived Ease of Use (PEOU) has a significant

effect on the Actual Use (AU). In this study, the researcher investigated the relationship between attitude (ATT) and actual Use (AU), as a previous study by Adewole-Odeshi, (2014) has indicated that there is a significant relationship between attitude and the Actual Use of the E-learning system. On this basis, the researcher proposes the following hypothesis: 6 Attitude (ATT) has a significant effect on Student Academic Performance (SAP). A study conducted by N. D. Oye, Adam, et al., (2012) indicates that Actual Use (ITU) significantly affects students' academic performance (β= .749; p = 0.001), where it can be concluded that Actual E-learning use significantly influences students' academic performance. Thus, the more the students use E-learning, the better their academic performance. On this basis, the researcher proposes the following hypothesis 5: Actual Use (AU) has a significant effect on the Attitude (ATT), and hypothesis 7: Actual Use (AU) has a significant effect on the Student Academic Performance (SAP).

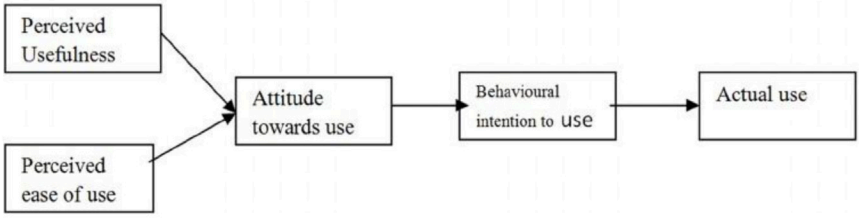
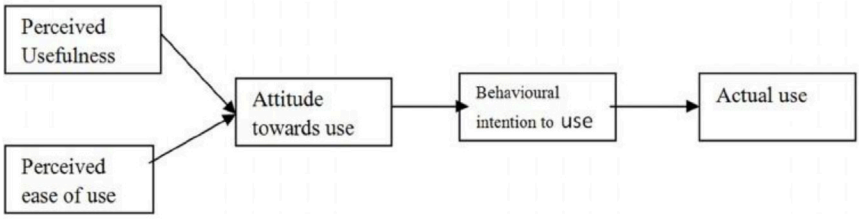


Fig. 1 The original technology acceptance model TAM (Davis, 1989)



The theoretical framework for this study is adopted from the Technology Acceptance Model TAM, of which is one of the well-known models related to technology acceptance proposed by Davis in 1986. The Technology Acceptance Model (TAM), in relation to the model as reflected below, influences external factors towards the attitude, belief and intention to use. TAM posited two cognitive beliefs namely perceived usefulness and

perceived ease of use. The findings by the TAM model indicate that the actual use of a technology system has been influenced directly or indirectly by the user's behavioural intentions, attitude, perceived usefulness of the system and the perceived ease itself of the system.

Hence, TAM also proposes that the external factors affect the factor of intention and actual use through the mediated effects on perceived usefulness and perceived ease of use. The above conceptual framework is used in this study.

Table 1. Summary of Researcher Hypothesis

H_1	Perceived Ease of Use (PEOU) has a significant effect on Attitude (ATT)
H_2	Perceived Usefulness (PU) has a significant effect on Attitude (ATT)
H_3	Perceived Ease of Use (PEOU) has a significant effect on Actual Use (AU)
H_4	Perceived Usefulness (PU) has a significant effect on Actual Use (AU)
H_5	Actual Use (AU) has a significant effect on the Attitude (ATT)
H_6	Attitude (ATT) has a significant effect on Student Academic Performance (SAP)
H_7	Actual Use (AU) has a significant effect on Student Academic Performance (SAP)

3. RESEARCH METHODOLOGY

Instrument Development - The instrument was developed by first reviewing the literature. We adopted existing construct items from past studies to ensure the best possible item reliability and validity. The items and their sources are in Appendix 1. All items were measured on a 5-point Likert scale (1 = 'strongly disagree' to 5 = 'strongly agree'). The respondents were also asked to provide their demographic profiles of gender, age, and working experience, service sector. The other variables were technology factors and academic performance.

Before the data was collected, the instrument and the items were validated and pre-tested. A pre- test is a procedure that will require responses and feedback from a small set of respondents from the population. For face validity, the constructs and the items were checked and examined by three faculty members who were experts in the field. The procedure was performed as a strategy to ensure each item represents the meaning of the construct, to indicate that the research content was related to the dimensions and variables, and to ensure no bias in this research was presented. A pilot test was also conducted to assess the quality of the instrument, the degree

of understanding of the statement, and the measure of the item's internal consistency score. Thirty undergraduate students participated in the pilot test. Ursachi et al., (2015) Mentioned a general acceptance rule: Cronbach alpha of 0.6 – 0.7 indicates an acceptable level of reliability, and 0.8 or greater indicates an excellent level. The results of the internal consistency score show that all scores are within the acceptable values.

3.1 DATA COLLECTION: SAMPLE AND PROCEDURES

The research design for this research was correlational research. According to Salkind (2009), correlational research is a method used to determine the relationship between two or more variables. This type of research design was chosen because it will indicate the relationship, if any; - the results also allow the researchers to examine the interrelationships among variables and draw explanatory inferences. Questionnaires were chosen for this study to collect data due to the ease of using them as well as their excellent acceptability, fast response obtainability and core consistency. and ease of conduct (Bourdon et al., 2005). Moreover, the questionnaires enhance the consistency and reliability of the results as they allow standardized quantitative data to be collected (Malhotra, 2006). The study was carried out on E-PJJ undergraduate students, and the sampling frame of this study was obtained from the Faculty of Business Studies, UiTM Puncak Alam. In determining the sample size, various strategies could be adopted. One of them is to use the sample- to-item ratio (Gorsuch, 1983). Using this method, the recommended sample size would be 155. To collect the data, an online survey was designed using Google Forms, and invitations to participate in the study were sent through emails and WhatsApp applications. A total of 155 responses were received, meeting the minimum number of a required sample size of 155 participants.

RESULT

This chapter presents the data analysis techniques and interpretation of the findings on the impact of e-learning on academic performance. The

finding was intended to answer the study's research objectives. Data was collected during data analysis and interpretation of findings, reports were produced in tables and figures, and qualitative analysis was done. Section 4.2 will discuss the reliability of the measurement scale obtained from the actual study. Meanwhile, Section 4.4 discusses the descriptive data analysis, which includes the respondents' background using bar charts, frequency tables, mean, and standard deviation. Section 4.6 explains the results from the logistic regression model.

4.1 DATA COLLECTION: SAMPLE

After the data was collected from the actual study, the reliability values for the measurement scales used to measure the students' participation and technology factors among e-PJJ students of Bachelor of Office Management were obtained. Based on table 4.1, the Cronbach's alpha technology factors for each item were 0.955, 0.940, 0.907 and 0.941 respectively. This indicates that both scales are highly reliable for this study. The result of the reliability test is summarized in table 1.

Table 2. Cronbach's Alpha Result for Actual Study

Scale	Cronbach's Alpha
Perceived Ease of Use (PEOU)	0.955
Perceived Usefulness (PU)	0.940
Attitude towards Using (ATT)	0.907
Actual Use (AU)	0.941

In conducting the research at hand, the researcher performed several analyses on the values of a Measure of Sampling Adequacy (MSA), the Kaiser-Meyer-Olkin, as well as Bartlett's test of Sphericity. In this particular instance, the value of the MSA was agreed upon at 0.5, as the appropriate value for the overall KMO must fall above 0.6. Meanwhile, Bartlett's Sphericity test is conducted to unravel whether a significant correlation might be projected between the proposed variables. According to (Gliner et al., 2011) initial communalities characterize the relation between the variable and all other variables, that is, the squared multiple correlation between the item and all other

items before rotation. If most commonalities are low <.30, a small sample size is more likely to distort results (Gliner et al., 2011). The researcher adopted the use of factor analysis to analyze the independent dependents on discarding any items from the instruments that resulted in high cross-loading. Factor analysis was

conducted on the independent variable. The list of tables below illustrates the factor loading for the rotated factors.

Table 3. Factor Analysis Result

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.947
Bartlett's Test of Sphericity	Approx. Chi-Square	3191.597
	df	105
	Sig.	.000

4.2 DESCRIPTIVE ANALYSIS

For this study, five demographic variables, which include gender, age, level of education, working position, working experience, and service sector, were determined. The frequency distribution of Office Management PJJ students is shown in Table 3 below. The number of female students involved in this study was 114 (74 %), while the number of male students was 41 or 26 %. A majority of the students (61.3 %) are students aged between 21 to 26 years old. The balance is followed by ages 27 to 32 years with 32.9 % (51 students), 33 to 38 years with 5.2% (8 students), and only one student aged 45 years and above. Almost 88.4% of students taking the Degree in Office

Management courses enrolled from the Diploma level. The balance level of education (STPM) are 13 students (8.4%), followed by SPM (3 students) with 1.9%, and two students with 1.3% were from other levels of education. Furthermore, the highest number of positions among the PJJ students was support staff (115 students), with 74.2%. This was followed by 24 students at 15.5% being at executive position. 11 students at 7.1%, and five students (3.2%) respectively, held managerial positions. Moreover, 41.9% (65 students) had less than

one year of working experience, and 62 students, at 20% had 2 to 5 years of working experience. The balance breakdown for work experience are 6 to 10 years of working experience (24 students at 15.5%), followed by10 to 15 years of working experience (three students with 1.9%), and only 1 (0.7%) student had 15 years or more of working experience. Meanwhile, most of the respondents were from the government service sector, which was 82 students, with 52.9%. Sixty-four students were from the private service sector at 41.3%, the balance of which is followed by self-employed (seven students at 4.5%), and NGO's service sector (two students at 1.3%).

Table 3. Frequency Distribution of Office Management e-PJJ Students based on the Demographic Profile Cronbach's Alpha Result for Actual Study

Variable	Description of Variable	Frequency	Percentage
Gender	Male	41	26%
	Female	114	74%
Age	21 to 26 years	95	61.3 %
	27 to 32 years	51	32.9 %
	33 to 38 years	8	5.2 %
	45 years and above	1	0.6 %
Education Level	SPM	3	1.9%
	STPM	13	8.4%
	Diploma	137	88.4%
	Master	0	0%
	PhD	0	0%
	Others	2	1.3%
Position	Support Staff	115	74.2%
	Executive	24	15.5%
	Manager	5	3.2%
	Others	11	7.1%
Working Experience	Less than 1 year	65	41.9%
	2 to 5 years	62	40%
	6 to 10 years	24	15.5%
	10 to 15 years	3	1.9%
	15 years and above	1	0.7%
Service Sector	Government	82	52.9%
	Private	64	41.3%
	Self Employee	7	4.5%
	Ngo's	2	1.3%
Total		**155**	**100%**

Students were asked to rate the grade point average (GPA) in five ranges: (less than 2.00, 2.01 – 2.50, 2.51 – 3.00, 3.01 – 3.50 and 3.51 – 4.00). The students' academic performances were then categorized into low, pass, moderate, and high. Those who have a GPA less than 2.00 were categorized as low. Those with a GPA between 2.01 and 2.50 were categorized as having a pass GPA. Those with a GPA between 2.51 to 3.00 and 3.01 to 3.50 were considered as having moderate CGPA. While those with a GPA between 3.51 to 4.00 were considered as having a high GPA. Figure 5.1 shows the students' academic performance among e-PJJ students. 83.2 per cent of the e-PJJ students (131 students) had a moderate GPA, followed by 12.3 per cent of students (19) having a high GPA. Then, 4.5 per cent of students (7 students) had a pass for their GPA, and none of the students got a low GPA.

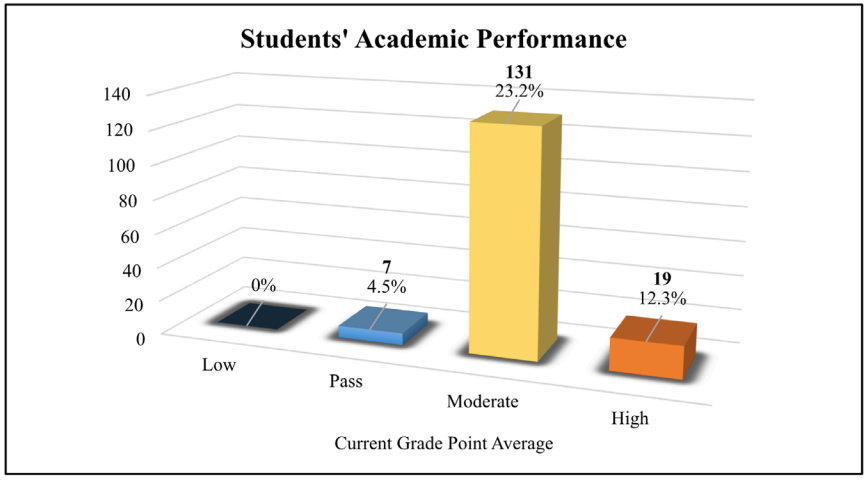


Fig. 2 Distribution of E-PJJ Students Based on Grade Point Average (GPA)

Table 4.1. Coefficient Table of the H1

Coefficients

		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.034	.160		-.215	.830		
	peou_m	.219	.088	.208	2.489	.014	.161	6.211

a. Dependent Variable: att_m

From the results above, it is indicated by the (p-value = .014) based on coefficients, that PEOU is at 21.9%; as a result, the Perceived Ease of Use (PEOU) significantly affects the Attitude (ATT). In conclusion, this hypothesis is accepted. H1: Perceived Ease of Use (PEOU) significantly affects Attitude (ATT).

Table 4.2. Coefficient Table of the H2

Coefficients

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.034	.160		-.215	.830		
pu_m	.786	.091	.717	8.593	.000	.161	6.211

a. Dependent Variable: att_m

From the result, it is indicated that the p-value for Perceived Usefulness (PU) and (p-value =.000) are significant as the p-values are smaller than a = 0.05. It can be concluded that hypothesis 2 is accepted. H2: Perceived Usefulness (PU) significantly affects Attitude (ATT).

Table 4.3. Coefficient Table of the H3

Coefficients

		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.106	.148		.717	.474		
	peou_m	.276	.081	.273	3.395	.001	.161	6.211

a. Dependent Variable: au_m

The result indicated the p-value for perceived Ease of Use (PEOU) and (P-value=0.01). Besides, it is indicated that hypothesis 3 is accepted as the p-values are smaller than a = 0.05, so it can be concluded that hypothesis 3 is accepted. H3: Perceived Ease of Use (PEOU) significantly affects Actual Use (AU).

Table 4.4. Coefficient Table of the H4

Coefficients

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.106	.148		.717	.474		
pu_m	.697	.085	.662	8.239	.000	.161	6.211

a. Dependent Variable: au_m

The result indicated that the p-value of the Perceived Usefulness (PU) and (p-value = 0.000) is significant as the p-values are smaller than a = 0.05, so it can be concluded that hypothesis 4 is accepted. H4: Perceived Usefulness (PU) significantly affects Actual Use (AU).

Table 4.5. Coefficient Table of the H5

Coefficients

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.286	.161		1.774	.078
au_m	.934	.037	.897	25.053	0.00

a. Dependent Variable: att_m

The result indicated that the p-value of the Actual Use (AU) and (p-value = 0.000) is significant as the p-value is smaller than a = 0.05, so it can be concluded that hypothesis 5 is accepted. H5: Actual Use (AU) significantly affects attitude (ATT).

Table 4.6. Classification table of the H6 and H7

Variable	Regression coefficient (B)	Odds ratio (95% CI)	Wald statistic	p-value
ATT	-2.121	0.120 (0.017,0.859)	4.456	0.035
AU	2.163	8.699 (1.155,65.516)	4.409	0.036
Constant	0.813	2.254		

Table 4.6 shows there are two variables, namely Attitude and Actual Use. The p-value indicates that these two variables significantly affect the student's academic performance, where the p-value <0.005- as a

conclusion this portrays that the strongest predictor affects the student's GPA, recording an odd ratio of 9.699. This indicates that the students who had no intention of using E-learning are over eight times more than students who have the intention to use e-learning.

This study used binary logistic regression analysis to determine the association between independent variables (ATT and AU) and students' GPA. A few steps are involved to get the final model of students' GPAs. First is the variable selection method. In this method, all variables (ATT and AU) were included in the model, and only variables with a p-value less than 0.05 were selected as the preliminary primary effect model. Then, model's fit was assessed using the Omnibus test of model coefficient, model summary, and Hosmer-Lemeshow test. The last step included the interpretation and presentation of the final model.

Table 4.7. Omnibus test of Model Coefficients

	Chi-Square	df	p-value
Model	5.414	2	0.047

Table 4.7 shows the omnibus test of the model coefficient. The omnibus test indicates whether the logistic regression model performs well. If the significant value is less than 0.05, the model is significant, and at least one predictor is significant in the model. The result shows the chi-square statistics for the model equals to 5.414 with a degree of freedom of two and a p-value (0.067), more significant than α (0.05). Therefore, this indicates that at least one predictor is not significant in the model.

Table 4.8. Model of Summary

-2 Log Likelihood	Cox & Snell r Square	Nagelkerke R Square
177.641	0.034	0.050

Based on Table 4.8, the value of 2 log-likelihood for the logistic model with two predictors (ATT and AU) equals 177.641. Cox & Snell R-square and Nagelkerke R-Square are pseudo-R-Square that indicate the proportion of variation in the response variable explained by the predictor variables. The closer the value to 1, the better the

model. In this study, the value of the Cox & Snell R-Square is 0.034, and NagelKerke R-Square is equal to 0.05. This indicates that the predictors (ATT and ITU) have explained about 3.4% and 5% of the dependent variable (Student GPA).

Table 4.9. Hosmer and Lemeshow Test

Model	Chi-square	p-value
	4.985	0.173

Table 4.9 shows the result of the Hosmer and Lemeshow test with a chi-square of 4.985 and a p-value of 0.173, which was greater than 0.05. This indicates that there was no significant difference between the observed probability and the expected probability. Thus, the model fits.

Table 4.10. Classification Table

Variable	Regression coefficient (B)	Odds ratio (95% CI)	Wald statistic	p-value
ATT	-2.121	0.120 (0.017,0.859)	4.456	0.035
AU	2.163	8.699 (1.155,65.516)	4.409	0.036
Constant	0.813	2.254		

Classification will indicate how well the model can predict the correct category (less than 3.00/above 3.00) for each case. The model correctly classified 74.2 per cent of cases overall. The sensitivity of the model is the percentage of the group that has a GPA above 3.00 and has been accurately identified by the model (true positives). In this study, we correctly classified 99.1 per cent of students with a GPA above 3.00. The model specification is the percentage of the group without the characteristic of interest where a student who gets a GPA less than 3.00 is correctly identified (true negatives). Based on the table below, the specificity is 9.3 per cent (students with a GPA below 3.00). Additionally, as shown in Table 4.10, there are two variables (ATT and AU) that were significantly affected by the student's academic performance (p-value<0.05). The strongest predictor that affects the Student's GPA is an odds ratio of 8.699. This indicated that students who intended to use learning were over eight times more than those who did not intend to use e-learning. The odds ratio of 0.120 for attitude was 0.12 times less likely than having a GPA above 3.00.

Table 4.11 Summary of Test of Significant

		GPA		
		Less than 3.00	Above 3.00	Percentage Correct
GPA	Less than 3.00	4	39	9.3
	Above 3.00	1	111	99.1
Overall percentage				74.2

Table 4.12. Summary table of model the 1,2,3.

	Model 1	Model 2	Model 3
Variables Included	DV: ATT IV: PU, PEOU	DV: AU IV: PU, PEOU	DV: ATT IV: AU
Model Summary			
R-Square	0.830	0.842	0.804
ANOVA	p-value (0.000)	p-value (0.000)	p-value (0.000)
Coefficient	PEOU = 0.219 (0.017*) PU = 0.786 (0.000*)	PEOU = 0.276 (0.001*) PU = 0.697 (0.000*)	AU = 0.934 (0.000*)

* Represent the p-value

Based on the table above, for model 1, the researcher includes the variables to test the model to investigate the relationship between Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) towards Attitude. The value of R square for model 1 is 0.83. It reflects that 83% of the attitude towards using (ATT) E-learning among the E-PJJ students is influenced by the factors of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). ANOVA shows that the p-value (0.000) is less than α (0.05). This indicates that the regression model with the three factors, perceived ease of use (PEOU) and perceived usefulness (PU), has explained the student's attitude towards using E-learning. Furthermore, the p-values for variables PEOU and PU are well below α (0.05), which means a significant relationship exists between the ATT factors. These findings aligned with findings (Abdullah & Toycan, 2017; Fathema et al., 2015) whereby the perceived usefulness has a significant relationship with attitude.

Based on the regression coefficient of PEOU, it is 0.219. It indicates that the PEOU is positively related to the ATT. This finding can be supported by Adewole-Odeshi (2014) since there is a significant relationship between Perceived Ease of Use and the attitude of

students towards E-learning; In other words, Perceived Ease of Use (PEOU) has a significant influence on attitude (ATT) ($P<0.01$) Thus, Perceived Ease of Use (PEOU) significantly influences the attitude of students (ATT) (Johari et al., 2015), The regression coefficient for PU is 0.786, indicating that the PU positively affects the ATT. N. A. Oye et al., (2012) indicate that the perceived use of E-learning significantly affects the attitude towards using E-learning. On the other hand, Al-Rahmi et al., (2020) also claimed that perceived ease of use is strongly linked to attitude, suggesting that the more students consider e-learning simple, the better they act when using it. Besides, among both significant variables (PEOU and PU), PU has the highest beta of 0.786. This means it has the strongest influence on ATT compared to other variables. Hence, PU is the highlighted predictor of ATT, followed by PEOU with a beta of 0.219.

Based on the table for model 2, the researcher includes the variable PU and PEOU as the independent variable while the variable Actual Use (AU) is the dependent variable. The value of R square for model 2 is 0.842. It reflects that 84.2% of the Actual Use (ITU) of e-learning among the E-PJJ students is influenced by the factors of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). ANOVA shows that the p-value (0.000) is less than α (0.05). This indicates that the regression model with the three factors, Perceived Ease of Use (PEOU) and Perceived Usefulness (PU), has explained the student's actual use of E-learning.

Furthermore, the p-values for variables PEOU and PU are well below α (0.05), which means a significant relationship exists between the factors. As the regression coefficient of PEOU is 0.276, the PEOU is indicated as being positively related to the AU. Ho Cheong & Park (2005) found that Perceived Ease of Use influenced students' intention to use internet-based learning. Theregression coefficient for PU is 0.697, indicating that the PU positively affects the AU. In addition, the p-value for the variable is more than α (0.05), and PU has the highest beta of 0.697. This means it has the most decisive influence on AU compared to other variables. Hence, PU is the highlighted predictor of AU, followed by PEOU with a beta of 0.276. The finding is also supported by Al-Adwan et al., (2013), who indicated that perceived usefulness (PU) has significantly influenced Actual Use (AU)

($p<0.05$) Johari et al. (2015). It has also been indicated in previous studies that (PU) has significantly influenced the intention to use (ITU) ($P<0.05$).

Based on the table for model 3, the researcher has included the variable Actual Use (AU) as the independent variable while the variable Attitude (ATT) as a dependent variable to test the model to investigate the relationship between Actual Use (AU) and Attitude (ATT). The value of R square for model 1 is 0.804. It reflects that 80.4% of the attitude toward using (ATT) E-learning among the E-PJJ students is influenced by students' actual use (AU). ANOVA shows that the p-value (0.000) is less than $\alpha(0.05)$. This indicates that the regression model with the AU has explained the student's ATT using E-learning. Furthermore, the p-values for variables AU are well below $\alpha(0.05)$, meaning there is a significant relationship between the factors. The regression coefficient of the ITU is 0.934 indicating that the ITU is positively related to the ATT. According to Allo (2020) this may also mean that the students had a positive attitude about the use of e-learning.

In conclusion, E-learning has become an increasingly popular learning approach in higher educational institutions due to the rapid growth of Internet technologies. This study has determined the factors that affected the relationship influencing Student Academic Performance in E-learning technology. The tables presented represent the interrelationship between the factors influencing student academic performance in E-learning technology. This study would benefit online institutions, online/distance instructors, decision-makers at all higher education levels, and online students. The implications for practices, barriers to e-learning, ongoing support by the government, study limitations, and research recommendations were discussed. This study shows that there are significant relationships between the hypotheses, as reflected in the e-learning in UiTM's setting.

This study also revealed that the attitude clearly reflected towards using E-learning among the E-PJJ students is influenced by Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). The findings also have great significance in contributing to the enhancement of the

current e-learning environment. The findings of this study can be used as guidelines and to assist policymakers in ensuring that E-learning methods are comprehensively applied to all higher education institutions.

REFERENCES

Abdullah, M. S., & Toycan, M. (2017). Analysis of the factors for the successful e-learning services adoption from education providers' and students' perspectives: A case study of private universities in Northern Iraq. Eurasia Journal of Mathematics, Science and Technology Education, 14(3), 1097–1109.

Adewole-Odeshi, E. (2014). Attitude of Students Towards E-learning in South-West Nigerian Universities: An Application of Technology Acceptance Model. Library Philosophy and Practice, 0_1.

Al-Adwan, A., Al-Adwan, A., & Smedley, J. (2013). Exploring student's acceptance of e-learning using the Technology Acceptance Model in Jordanian universities. International Journal of Education and Development Using Information and Communication Technology, 9(2), 4.

Al-Rahmi, W. M., Alzahrani, A. I., Yahaya, N., Alalwan, N., & Kamin, Y. Bin. (2020). Digital communication: Information and communication technology (ICT) usage for education sustainability. Sustainability, 12(12), 5052.

Aljawarneh, S. A. (2020). Reviewing and exploring innovative ubiquitous learning tools in higher education. Journal of Computing in Higher Education, 32, 57–73.

Allo, M. D. G. (2020). Is online learning good in the midst of Covid-19 Pandemic? The case of EFL learners. Jurnal Sinestesia, 10(1), 1–10.

Clark, R. C., & Mayer, R. E. (2016). E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning. John Wiley & Sons.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 319–340.

Fathema, N., Shannon, D., & Ross, M. (2015). Expanding the Technology Acceptance Model (TAM) to examine faculty use of Learning Management Systems (LMSs) in higher education institutions. Journal of Online Learning & Teaching, 11(2).

Gill, A. A., Malik, S., Iqbal, S., Haseeb, H., & Akhtar, N. (2020). AN EMPIRICAL STUDY OF HIGHER EDUCATION STUDENTS'INTENTIONS TO USE E-LEARNING: DEVELOPING COUNTRY PERSPECTIVE. PalArch's Journal of Archaeology of Egypt/Egyptology, 17(8), 1046–1058.

Gliner, J. A., Morgan, G. A., & Leech, N. L. (2011). Research methods in applied settings: An integrated approach to design and analysis. Routledge.

Gong, M., Xu, Y., & Yu, Y. (2004). An enhanced technology acceptance model for web-based learning. Journal of Information Systems Education, 15(4), 365.

Ho Cheong, J., & Park, M.-C. (2005). Mobile internet acceptance in Korea. Internet Research, 15(2), 125–140.

Hong, J.-C., Tai, K.-H., Hwang, M.-Y., Kuo, Y.-C., & Chen, J.-S. (2017). Internet cognitive failure relevant to users' satisfaction with content and interface design to reflect continuance intention to use a government e-learning system. Computers in Human Behavior, 66, 353–362.

Johari, N., Mustaffha, N., Ripain, N., Zulkifli, A., & Ahmad, N. W. (2015). Students' Acceptance of Online Learning in KUIS. International Conference on Economics and Banking (Iceb-15).

Kumar, A., & Johari, S. (2015). Push notification as a business enhancement technique for e-commerce. 2015 Third International Conference on Image Information Processing (ICIIP), 450–454.

KunhiMohamed, B. B. V. (2012). Student participation and grade performance in an undergraduate online learning environment. Colorado State University.

Madar, M. J., & Ibrahim, O. Bin. (2011). E-learning towards student academic performance. Research and Innovation in Information Systems (ICRIIS), 2011 International Conference On, 1–5.

Oye, N. A., Iahad, N., Madar, M. J., & Rahim, N. (2012). The impact of e-learning on students' performance in tertiary institutions. International Journal of Computer Networks and Wireless Communications, 2(2), 121–130.

Oye, N. D., Adam, M. H., & Nor Zairah, A. R. (2012). Model of perceived influence of academic performance using social networking. International Journal of Computers and Technology, 2(2), 24–29.

Oye, N. D., Iahad, A., Madar, M. J., & Rahim, A. (2012). The impact of e-learning on students performance in tertiary institutions. IRACST–International Journal of Computer Networks and Wireless Communications, 2 (2), 2250–3501.

Ursachi, G., Horodnic, I. A., & Zait, A. (2015). How reliable are measurement scales? External factors with indirect influence on reliability estimators. Procedia Economics and Finance, 20, 679–686.

Evaluation of Knowledge, Attitude, and Perception of Pictograms in Improving Understanding of Foreign Medicine Packages and Leaflets among Malaysians

John Kwong Siew Shia[1], Nurul Athirah Muhamad Zainal Abidin[2], Mohamed Razeef Abdul Razak[3], Nadia Jalaludin[1], Nik Ateerah Rasheeda Mohd Rocky[1], Siti Nooraishah Hussin[1*]

[1]Department of Pharmaceutical Life Sciences, Faculty of Pharmacy, Universiti Teknologi MARA Selangor Branch, Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor, Malaysia.
[2]Faculty of Pharmacy, Universiti Teknologi MARA Selangor Branch, Puncak Alam Campus, 42300 Puncak Alam, Selangor, Malaysia.
[3]College of Creative Arts, Universiti Teknologi MARA Selangor Branch, Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor, Malaysia.
**Corresponding Author: nooraishah0352@uitm.edu.my*

Received: 15 November 2024
Accepted: 25 December 2024
Date Published Online: 1 January 2024
Published: 1 January 2024

Abstract: *Access to foreign medicines is now more prevalent due to globalization and international travel. However, understanding the labels and content of these medications can be challenging due to the language barrier. Pictograms are visual representations of words or phrases, that can be used on foreign medicinal packages and leaflets to ensure the correct usage of the medications. This study aims to explore the knowledge, attitude, and perception of pictograms in improving the understanding of foreign medicine packages and leaflets among the Malaysian population. Methods: This was a cross- sectional study with stratified random convenience sampling. A total of 397 Malaysian respondents participated in this study. A set of questionnaires was distributed using the Google Forms platform. The scores on knowledge, attitude, and perception were assessed based on previous studies by Bloom's cut- off point criteria. SPSS version 28.0 was used to analyze the data. Results: Analysis of the respondent's sociodemographic data features found that area of living ($\chi 2=21.868$, $p=<0.001$), educational level ($\chi 2=43.146$, $p=<0.001$) and monthly family income ($\chi 2=24.173$,*

p=<0.001) had a significant association with knowledge of pictograms. From all the respondents, the mean scores of 22.00 ± 5.50 and 22.17 ± 5.60 were obtained for attitude and perception, respectively, based on the maximum score of 30. Conclusion: Malaysian population especially the younger population showed a moderate knowledge, attitude, and perception toward pictograms.

Keywords: *Medicinal packages, Leaflets, Pictogram.*
more the students use E-learning, the better their academic performance. This study would benefit online institutions, online / distance instructors, decision-makers at all higher education levels, and online students. The

INTRODUCTION

In the early years of the 21st century, tourism became one of the popular sectors, exerting substantial influence on the economic growth and development of numerous countries across the globe (Hall, 2021). Apart from that, access to foreign medicines has become increasingly common as people travel internationally and diverse pharmaceutical products are imported into various countries. During travel to a foreign country, communication and language barrier is common especially when accessing the healthcare sector (Al Shamsi et al., 2020). Therefore, most people usually practise self-medication using over-the-counter (OTC) drugs to treat minor ailments such as headache, fever, cough, and more as they are available at any convenience store (Doomra & Goyal, 2020; Kebodeaux, 2019).

However, understanding the contents and instructions of these foreign medicine packages and leaflets can often pose a significant challenge, particularly when they are not available in one's native language (Tesfamariam et al., 2019). Therefore, the use of pictograms has gained attention as a potential solution to enhance comprehension and at the same time, ensure the safe usage of medicines (Figueroa et al., 2023; Nualdaisri et al., 2021).

A pictogram is an illustration of a picture or symbol that represents a word or a phrase (Sletvold et al., 2020). Pictograms are used in all domains of our daily lives and can be found in many settings such as hospitals, airports, zoo,

gardens, schools and universities, museums and libraries, and many more (Adîr et al., 2021; Choi & Choi, 2021). For instance, they are commonly used to quickly convey important information such as prohibitions or warning signs on the road or safety hazards in the lab (Roca et al., 2018; Rossete & Ribeiro, 2021). In the context of medication, pictograms are used to represent the essential details of the medication including indications, dosage, side effects, and special warnings (Merks et al., 2018).

In a healthcare setting, research has demonstrated that the use of pictograms can enhance patients' understanding, memory retention, and adherence to prescribed medications (Chanzu et al., 2023). The use of a visual approach can likely improve the medication labelling and the usability of the leaflets (Van Beusekom et al., 2018). Understanding the medicinal packages and leaflets is crucial in ensuring the proper usage of the medications. A lack of understanding of the information on the labels and leaflets can cause medication errors that lead to negative health outcomes such as injury or adverse events (M. Kim et al., 2022).

This study aims to explore the knowledge, attitude, and perception of pictograms in improving the understanding of foreign medicine packages and leaflets among the Malaysian population. Understanding the Malaysian population's perception and attitude towards pictograms in the context of foreign medicine packages and leaflets is crucial for developing effective communication strategies. It will help identify potential barriers, such as cultural differences, literacy levels, and visual literacy skills, that may impact the successful utilization of pictograms. Furthermore, this research will shed light on the potential for improving the design and implementation of pictograms to enhance comprehension and ensure the safe and effective use of foreign pharmaceutical products.

2. MATERIALS AND METHODS

Ethics approval (REC (PH)/UG/073/2023) was issued by the Research Ethics Committee (REC) of Universiti Teknologi MARA (UiTM). This was a cross-sectional study with stratified random convenience sampling. The target respondents were among the Malaysian population across the states. The sample size of the population was determined by Raosoft Sample

Size Caluculation at 95% confidence interval, 5% margin of error, and 50% response distribution. A total of 397 Malaysian respondents participated in this study.

The research was structured to gather the respondents' information via bilingual questionnaires in English and Malay. The questionnaires consisted of four sections. Section A consisted of seven questions related to the sociodemographic data of the respondents. Section B comprised seven questions related to knowledge of pictograms while section C contained six items related to attitude towards pictograms. Lastly, section D assessed the perception of respondents toward pictograms with six items. From sections B to D, all items were measured using a five-point Likert scale (1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5= Strongly Agree). The scores of knowledge, attitude, and perception were graded based on previous studies (Akalu et al., 2020; Alzahrani et al., 2022) and Bloom's cut-off point criteria as good (80% to 100%), moderate (60% to 79%), and poor (less than 60%) knowledge.

The questionnaires were incorporated into an online survey platform, Google Forms, before being disseminated to the respondents through formal email, Telegram, and WhatsApp. The sampling process was conducted from March to May 2023. Prior to statistical analyses, a preliminary test using Cronbach's alpha was conducted to check for the reliability of the data. The Statistical Package for the Social Science (SPSS) software version 28.0 was used for the statistical analyses in this study. The Kolmogorov-Smirnov test was performed to test for the data normality distribution. Descriptive statistics were used to describe the demographic profile of respondents, while inferential statistical analysis such as Pearson's Chi-square test was carried out to associate the demographic variables with knowledge, attitude, and perception of respondents towards pictograms. The analysis of variance (ANOVA) test was used to examine the effect of demographic characteristics on participants' attitudes and perception scores. Post-hoc Tukey's HSD test was conducted to determine the difference between groups. A p-value < 0.05 was considered the cut-off level for statistical significance.

3. RESULTS

The study received a total of 400 responses throughout the online survey- out of which, three were excluded because one of them was less than 18 years old and the other two did not agree to participate in the study. Therefore, only 397 responses were considered eligible in this study. The distribution of the respondents across 14 states in Malaysia is presented in Fig 1. The majority of the respondents come from Kelantan (29%). In contrast, the fewest respondents are from Perlis (1%).

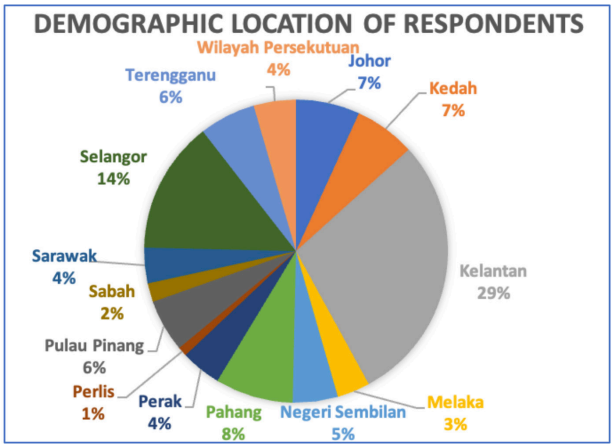


Fig 1: Demographic location of respondents

The present study shows that 152 of the respondents live in urban areas, while 131 and 114 of them live in sub-urban and rural areas, respectively. The respondents consist of 264 females, and the remaining 133 are males. The majority of respondents are aged between 18 and 25 (56.2%), while 21.2% of the respondents are categorized between 26 and 35 years. A total of 13.9% of the respondents are aged between 36 and 45, while 8.1% of respondents are categorized between 46 and 55 years. Only 0.8% of the respondents are aged above 55 years old. A total of 253 respondents are single (64.7%) and 144 of them are married (36.3%).

Education wise, more than half of the respondents possess bachelor's degrees (231), followed by 82 of them as having gone through secondary education, 31 having gone through primary education, 18 have master's

degrees and only 3 of them have PhDs. In addition, most of the respondents have a monthly family income of above RM7000 (36%) and only 2.3% respondents have less than RM1000 monthly family income.

Table 1 describes the association between demographic data and the knowledge of the Malaysian population towards pictograms. It was found that area of living ($\chi 2=$, 21.868, $p= <0.001$), educational level ($\chi 2=$, 43.146, $p= <0.001$), and monthly family income ($\chi 2=$, 24.173, $p= <0.001$) had significant associations with knowledge of pictograms.

Table 1: Association between demographic data and knowledge of the Malaysian population towards pictograms

Variable	Knowledge of pictograms n (%)			χ2	p-value
	Poor	Fair	Good		
Area of Living				21.868[a]	**< 0.001***
Urban	29 (28.7)	60 (37.0)	63 (47.0)		
Sub-urban	26 (25.7)	61 (37.7)	44 (32.8)		
Rural	46 (45.5)	41 (25.3)	27 (20.1)		
Gender				2.265[a]	0.322
Male	40 (39.6)	51 (31.5)	42 (31.3)		
Female	61 (60.4)	111 (68.5)	92 (68.7)		
Age (Years Old)				8.706[a]	0.368
18-25	51 (50.5)	100 (61.7)	72 (53.7)		
26-35	20 (19.8)	32 (19.8)	32 (23.9)		
36-45	17 (16.8)	20 (12.3)	18 (13.4)		
46-55	11 (10.9)	9 (5.6)	12 (9.0)		
Above 55	2 (2.0)	1 (0.6)	0 (0.0)		
Marital Status 0.448[a]	0.799				
Single	62 (61.4)	106 (65.4)	85 (63.4)		
Married	39 (38.6)	56 (34.6)	49 (36.6)		
Educational level	43.146[a]	**<0.001***			
Primary Education	18 (17.8)	10 (6.2)	3 (2.2)		
Secondary Education	26 (25.7)	28 (17.3)	14 (10.4)		
Diploma	8 (7.9)	21 (13.0)	17 (12.7)		
Bachelors	49 (48.5)	96 (59.3)	86 (64.2)		
Masters	0 (0.0)	6 (3.7)	12 (9.0)		
Doctor of Philosophy (PhD)			0 (0.0)	1 (0.6)	2 (1.5)
Monthly Family Income (RM)				24.173[a]	**<0.001***
Less than RM1000	5 (5.0)	2 (1.2)	2 (1.5)		
RM1000 – RM3999	47 (46.5)	52 (32.1)	31 (23.1)		
RM 4000 – RM6999	26 (25.7)	51 (31.5)	38 (28.4)		
Above RM7000	23 (22.8)	57 (35.2)	63 (47.0)		

[a] Based on Pearson's Chi-Square
*Statistically significant at p-value < 0.001

The findings show that regardless of area of living, a majority of respondents (40.8%) have fair knowledge of pictograms while 33.8% and 25.4% of them displayed good and poor knowledge respectively. In general, respondents who lived in urban areas are prone to have good knowledge (47%) of pictograms, while rural respondents contributed about 45.5% towards poor knowledge. Other than that, the results also showed that respondents with a bachelor's educational level had the highest percentage (64.2%) of "good knowledge towards pictogram" compared to respondents with other educational levels. Respondents that had a monthly family income of above RM7000 had an obvious "good knowledge towards pictogram" (47%), in contrast with respondents with an income range of less than RM1000 (1.5%).

The attitudes towards pictograms among the Malaysian population were also investigated. The majority of respondents have a moderate attitude towards pictograms (44.3%). The frequency distribution of the respondent's attitudes regarding pictograms is depicted in Fig 2. There was a total of six statements to evaluate the attitude of respondents. The total maximum score for attitude is 30. By referring to Fig. 2, the mean attitude score for all respondents was 22.00 ± 5.50.

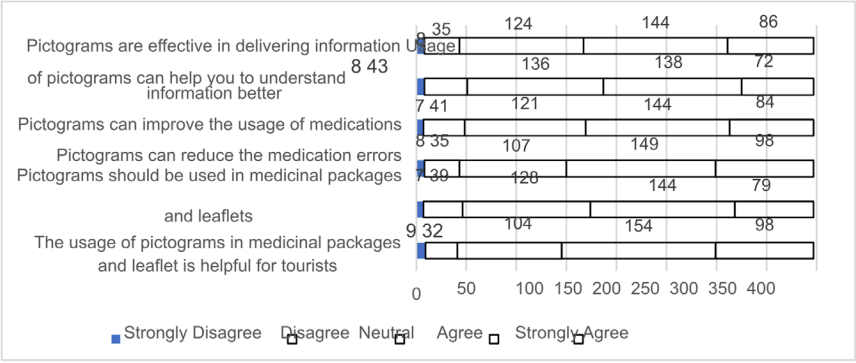


Fig 2: Attitude of Malaysian Population towards pictograms.

There were 86 (21.7%) respondents who strongly agreed that pictograms are effective in delivering information, while only 8 (2.0%) respondents strongly disagreed with it. On the other hand, a total of 210 respondents (52.9%) either agreed or strongly agreed that using pictograms can help them understand the information better. Other than that, about 57.4% of the respondents (n=228) either agreed or strongly agreed that pictograms can improve the usage of medications and only 1.7 % (n=7) strongly disagreed with this statement. Moreover, about 62.2% of the respondents either agreed or strongly agreed that pictograms can reduce medication errors. More than half of the respondents, 223 of them (56.2%) either agreed or strongly agreed that pictograms should be used in medicinal packages and leaflets. Lastly, a total of 252 respondents (63.5%) either agreed or strongly agreed that the usage of pictograms in medicinal packages and leaflets is helpful for tourists. It is noteworthy to mention that, many of the respondents in the present study remained undecided or skeptical about pictograms, thus fluctuating between neutral, disagree, and strongly disagreed responses.

Table 2 depicts the frequency distribution of respondents' perceptions towards the pictograms. The mean attitude score was 22.17 ± 5.60 out of a maximum score of 30. A total of 243 respondents (61.2%) either agreed or strongly agreed that the pictogram is beneficial for the Malaysian population. Approximately 57.2% of the respondents (n=227) either agreed or strongly agreed that pictograms can be easily understood by the Malaysian population. A total of 238 (59.9%) and 224 (56.4%) respondents either agreed or strongly agreed that pictograms are more easily processed at a distance than textual information, and, can potentially be interpreted more accurately and quickly than words, respectively. Most of the respondents (61.2%, n=243) either agreed or strongly agreed that pictograms make warnings more noticeable or attention-grabbing, while 11.2% (n=41) either disagreed or strongly disagreed with this statement. Lastly, a total of 234 (58.9%) respondents either agreed or disagreed, that pictograms can improve communication. It is important to note that many of the respondents in the present study remained neutral on their perception toward pictograms.

Table 2: Perception of Malaysian population towards pictograms

Perception	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
			n (%)		
Pictograms are beneficial for the Malaysian population.	8 (2.0)	33 (8.3)	113 (28.5)	140 (35.3)	103 (25.9)
Pictogram can be easily understood by the Malaysian population.	9 (2.3)	33 (8.3)	128 (32.2)	144 (36.3)	83 (10.9)
Pictograms are more easily processed at a distance than textual information.	11 (2.8)	34 (8.6)	114 (28.7)	137 (34.5)	101 (25.4)
Pictograms are potentially interpreted more accurately and quickly than words.	8 (2.0)	41 (10.3)	124 (31.2)	144 (36.3)	80 (20.2)
Pictograms make warnings more noticeable or "attention grabbing".	10 (2.5)	37 (9.3)	107 (27.0)	134 (33.8)	109 (27.5)
Pictograms can improve in communication better.	11 (2.8)	36 (9.1)	116 (29.2)	136 (34.3)	98 (24.7)

The difference in perception of pictograms as attention-grabbing between the age groups was analyzed using ANOVA and it was found to be significant ($F(4) = 13.543$, $p = 0.001$). Further analysis using a post-hoc test indicated that respondents aged between 18 to 25 years group have different perceptions compared to respondents from those aged above 55 years group.

DISCUSSION

The analysis of the sociodemographic data features in relation to the respondents' knowledge of pictograms has revealed that respondents' educational level had an influence on their knowledge of the pictogram. In the present study, respondents with higher education, particularly those with bachelor's degrees, demonstrated a better knowledge of pictograms compared to individuals with other educational backgrounds. This finding can be attributed to the composition of the surveyed population, which predominantly consisted of bachelor's students. Students are likely to have a higher level of familiarity

with pictograms due to their routine exposure to visual tools in educational settings (Guaicha et al., 2020). For instance, students had been introduced to pictograms that were used in the laboratory such as the warning sign of chemical hazards and also the laboratory apparatus (Wu et al., 2021). People with lower educational levels had lower knowledge of pictograms due to a low level of familiarity.

The present findings on respondents' attitudes towards pictograms provide valuable insights on their perception of the effectiveness and potential benefits of using pictograms, in delivering information on medicinal packages and leaflets. In all statements, the majority of respondents expressed agreement or neutrality, while a smaller proportion strongly agreed or strongly disagreed. Overall, the mean attitude score suggested a moderate attitude towards pictograms among the respondents. Most of the respondents agreed that pictograms are effective in delivering information, and firmly believed that pictograms successfully convey information and facilitate understanding. This indicates that pictograms are seen as a reliable and valuable communication tool (Dowse, 2021b). However, there was also a high number of respondents who expressed a neutral stance regarding the effectiveness of pictograms, likely due to differences in preference and variations in visual literacy skills. Different individuals may interpret pictograms differently based on their visual literacy abilities (Dowse, 2021a). Hence, the effectiveness of pictograms in conveying information may vary among different respondents. In addition, several studies also emphasize that pictograms are more effective in delivering information when used in conjunction with text, rather than when used alone (Algabbani et al., 2022; Heyns et al., 2021). Furthermore, it is evident that a majority of the respondents agreed that pictograms can improve the usage of medications. This finding aligns with the results reported by Mahmoud et al. (2018), where over half of the respondents (68%) also agreed that pharmaceutical pictograms aid in the proper usage of medication (Mahmoud et al., 2018). Pictograms play a crucial role in helping consumers understand medication instructions and significantly influence the proper use of medications, especially for individuals with low health literacy (Ng et al., 2017). For instance, a study showed that there was a significant improvement in the usage of asthma technique inhalers in the group with the pictogram compared to the control group (Almomani et al., 2018). In addition, most of the respondents in the present study agreed that the usage of pictograms can reduce medication errors, which aligns with a study conducted by Patidar et al. (2020). This study demonstrated that pictogram interventions reduced dosing errors among mothers with poor health literacy when administering liquid medication to children by approximately 48 to 54% and improved the mothers' understanding of dosing (Chan et al., 2015; Patidar et al., 2021). Therefore, pictograms are being utilized in patient counselling within pharmacy settings to enhance compliance and medication safety (Merks et

al., 2021; Vaillancourt et al., 2019). Overall, the present results revealed that the majority of the respondents agreed that pictograms should be used in medication packages and leaflets. This finding is similar to a study conducted by Boisadan et al. (2020), which reported that approximately 93.3% of the respondents believed that pictograms should be included in medication labels (Boisadan et al., 2020). This is due to the capability of pictograms that can enhance the readability of packages and leaflets, thereby improving medication prescription (Deepak & Gaur, n.d.; Phimarn et al., n.d.; Zheng et al., 2022). However, it is important to note that pictograms should not be used alone to avoid potential misinterpretation (Y. S. Kim et al., 2023).

The present study revealed that the respondents had a moderate perception towards pictograms. A significant portion of the respondents agreed that pictograms make warnings more noticeable or attention-grabbing. This finding aligns with a study conducted by Vallance et al. (2018), where the respondents showed positive feedback when the pictograms were used on the container of the alcohol to give the guideline regarding the standard dose (Vallance et al., 2018). In comparison to the other study, Fukuda et al. (2019) revealed that the awareness of pictograms as driving warning signs is low in Japan (Fukuda et al., 2019). Further analysis showed variations in the results between the younger and elderly groups. Younger respondents perceived pictograms as more attention-grabbing compared to the elderly. This could be attributed to the fact that older respondents faced more difficulties in interpreting pictograms correctly compared to their younger counterparts (Saremi et al., 2020). The older group usually displayed poor performance in interpreting the pictograms due to a decline in abstraction ability compared to the younger group (Beaufils et al., 2014). Additionally, cognitive

decline and vision impairment among the elderly might hinder their ability to draw attention toward visual pictograms, unlike the younger respondents (Fortuna, 2020).

Overall, most of the respondents agreed that pictograms are beneficial to the Malaysian population. The recognition of the benefits of pictograms suggests that respondents perceive them as valuable aids in conveying information, particularly in situations where language proficiency or literacy levels may pose challenges (Malhotra et al., 2022). Incorporating pictograms

into various communication platforms, such as medication packaging and healthcare settings, can significantly improve understanding, enhance safety, and facilitate better overall communication within the Malaysian population.

CONCLUSION

In conclusion, the Malaysian population, specifically the younger population, shows a moderate knowledge, attitude, and perception toward pictograms and there is a positive recognition of the potential benefits and effectiveness of pictograms in various domains. The findings suggest widening the research to include the general population, including the elderly and children, in order to obtain more valuable insights into the knowledge, attitudes, and perceptions towards pictograms among Malaysians.

REFERENCES:

Adîr, G., Adîr, V., & Pascu, N. E. (2021). Pictogram, Powerful Information Tool for People. Tehnički Vjesnik, 28(4), 1433–1436. https://doi.org/10.17559/TV-20170206193106

Akalu, Y., Ayelign, B., & Molla, M. D. (2020). Knowledge, attitude and practice towards covid-19 among chronic disease patients at addis zemen hospital, Northwest Ethiopia. Infection and Drug Resistance, 13, 1949–1960. https://doi.org/10.2147/IDR.S258736

Al Shamsi, H., Almutairi, A. G., Al Mashrafi, S., & Al Kalbani, T. (2020). Implications of Language Barriers for Healthcare: A Systematic Review. Oman Medical Journal, 35(2), e122. https://doi.org/10.5001/OMJ.2020.40

Algabbani, A. M., Alzahrani, K. A., Sayed, S. K., Alrasheed, M., Sorani, D., Almohammed, O. A., & Alqahtani, A. S. (2022). The impact of using pictorial aids in caregivers' understanding of patient information leaflets of pediatric pain medications: A quasi-experimental study. Saudi Pharmaceutical Journal, 30(5), 544–554. https://doi.org/10.1016/J.JSPS.2022.02.017

Almomani, B. A., Mokhemer, E., Al-Sawalha, N. A., & Momany, S. M. (2018). A novel approach of using educational pharmaceutical pictogram for improving inhaler techniques in patients with asthma. Respiratory Medicine, 143, 103–108. https://doi.org/10.1016/J.RMED.2018.09.004

Alzahrani, M. M., Alghamdi, A. A., Alghamdi, S. A., & Alotaibi, R. K. (2022). Knowledge and Attitude of Dentists Towards Obstructive Sleep Apnea. International Dental Journal, 72(3), 315–321. https://doi.org/10.1016/J.IDENTJ.2021.05.004

Beaufils, E., Hommet, C., Brault, F., Marqué, A., Eudo, C., Vierron, E., De Toffol, B., Constans, T., & Mondon, K. (2014). The effect of age and educational level on the cognitive processes used to comprehend the meaning of pictograms. Aging Clinical and Experimental Research, 26(1), 61–65. https://doi.org/10.1007/S40520-013-0179-6/METRICS

Boisadan, A., Buisine, S., Moreau, P., & Boumenir, Y. (2020). Designing universal visuotactile pictograms for orientation maps. Journal of Accessibility and Design for All, 10(1), 31. https://doi.org/10.17411/jacces.v10i1.219

Chan, H. K., Hassali, M. A., Lim, C. J., Saleem, F., & Tan, W. L. (2015). Using pictograms to assist caregivers in liquid medication administration: a systematic review. Journal of Clinical Pharmacy and Therapeutics, 40(3), 266–272. https://doi.org/10.1111/JCPT.12272

Chanzu, A., Wells, M., Vitkin, N., & Nersesian, S. (2023). Infographics and/or Pictograms and Medication Adherence: A Scoping Review. Healthy Populations Journal, 3(2). https://doi.org/10.15273/HPJ.V3I2.11553

Choi, K., & Choi, J. (2021). Investigation of Radiation Safety Pictogram Recognition in Daily Life. International Journal of Environmental Research and Public Health 2021, Vol. 18, Page 2166, 18(4), 2166. https://doi.org/10.3390/IJERPH18042166

Deepak, K., & Gaur, A. (2018). Scope Of Improvement of Patient Information Leaflets in Randomly Selected Therapeutic Classes of Drugs. International Journal of Pharma Sciences and Research (IJPSR), Vol 9 (3), 46-50

Doomra, R., & Goyal, A. (2020). NSAIDs and self-medication: A serious concern. Journal of Family Medicine and Primary Care, 9(5), 2183. https://doi.org/10.4103/JFMPC.JFMPC_201_20

Dowse, R. (2021a). Designing and reporting pictogram research: Problems, pitfalls and lessons learnt. Research in Social and Administrative Pharmacy, 17(6), 1208–1215. https://doi.org/10.1016/J.SAPHARM.2020.08.013

Dowse, R. (2021b). Pharmacists, are words enough? The case for pictograms as a valuable communication tool. Research in Social and Administrative Pharmacy, 17(8), 1518–1522. https://doi.org/10.1016/J.SAPHARM.2020.10.013

Figueroa, R., Taramasco, C., Flores, C., Ortiz, L., Vásquez-Venegas, C., Salas, P., & Zeng-Treilter, Q. (2023). A Physician's Perspective on the Incorporation of Pictograms as a Supplement to Medical Instructions in Chile: A Pilot Study. IRBM, 44(1), 100712. https://doi.org/10.1016/J.IRBM.2022.04.001

Fortuna, J. (2020). Exploring Associations Between Health Literacy and Visual Exploring Associations Between Health Literacy and Visual Impairment in Older Adults with Age-Related Macular Impairment in Older Adults with Age-Related Macular Degeneration (AMD) Degeneration (AMD). The Open Journal of Occupational Therapy, 8. https://doi.org/10.15453/2168-6408.1735 Fukuda, Y., Ando, S., & Saito, M. (2019). Effect of a Japanese drug alert pictogram on medication- taking/driving behavior. Https://Doi.Org/10.1080/15389588.2019.1680838, 21(1), 18–23. https://doi.org/10.1080/15389588.2019.1680838

Guaicha, K., Delgado, J. C., Coello, A., Rivera, A., Yaure, A., & Quevedo, H. (2020). Use of Digital Pictograms as a Teaching Strategy to Strengthen The Reading Process of Students in Basic General Education. Edulearn 20 Proceedings, 1, 4199–4204. https://doi.org/10.21125/EDULEARN.2020.1118

Hall, C. M. (2021). Constructing sustainable tourism development: The 2030 agenda and the managerial ecology of sustainable tourism. In Activating Critical Thinking to Advance the Sustainable Development Goals in Tourism Systems (pp. 198–214). Routledge.

Heyns, J., Huyssteen, M. Van, & Bheekie, A. (2021). The effectiveness of using text and pictograms on oral rehydration, dry-mixture sachet labels. African Journal of Primary Health Care & Family Medicine , 13(1), 1–11. https://doi.org/10.4102/PHCFM.V13I1.2646

Kebodeaux, C. D. (2019). Prescription and over-the-counter medication record integration: A holistic patient-centered approach. Journal of the American Pharmacists Association, 59(2), S13–S17. https://doi.org/10.1016/J.JAPH.2018.10.002

Kim, M., Suh, D., Barone, J. A., Jung, S. Y., Wu, W., & Suh, D. C. (2022). Health Literacy Level and Comprehension of Prescription and Nonprescription Drug Information. International Journal of Environmental Research and Public Health, 19(11), 6665. https://doi.org/10.3390/IJERPH19116665/S1

Kim, Y. S., Im, H., Lee, S., Cho, H., & Lee, S. (2023). "We Speak Visually": User-Generated Icons for Better Video-Mediated Mixed-Group Communications Between Deaf and Hearing Participants. Conference on Human Factors in Computing Systems - Proceedings. https://doi.org/10.1145/3544548.3581151

Mahmoud, L., Mohamed, A., Addin, K., & Idris, M. A. (2018). Impact of Newly Designed, Culturally Sensitive Pharmaceutical Picrograms on Medication Information and Use: Sudan Study. Kamal et al. World Journal of Pharmaceutical Research, 7, 56. https://doi.org/10.20959/wjpr20188-11889

Malhotra, R., Suppiah, S., Tan, Y. W., Tay, S. S. C., Tan, V. S. Y., Tang, W. E., Tan, N. C., Wong, R. Y. H., Chan, A., Koh, G. C. H., & Vaillancourt, R. (2022). Validation of pharmaceutical pictograms among older adults with limited English proficiency. Patient Education and Counseling, 105(4), 909–916. https://doi.org/10.1016/J.PEC.2021.07.015

Merks, P., Świeczkowski, D., Balcerzak, M., Drelich, E., Białoszewska, K., Cwalina, N., Krysinski, J., Jaguszewski, M., Pouliot, A., & Vaillancourt, R. (2018). The evaluation of pharmaceutical pictograms among elderly patients in community pharmacy settings - a multicenter pilot study. Patient Preference and Adherence, 12, 257–266. https://doi.org/10.2147/PPA.S150113

Merks, P., Świeczkowski, D., Balcerzak, M., Religioni, U., Drelich, E., Krysiński, J., Hering, D., & Jaguszewski, M. (2021). Patient counselling service with the use of pictograms as the example of pharmacist intervention to improving compliance and medicine safety. Cardiology Journal, 28(6), 879–886. https://doi.org/10.5603/CJ.A2021.0022

Ng, A. W. Y., Chan, A. H. S., & Ho, V. W. S. (2017). Comprehension by older people of medication information with or without supplementary pharmaceutical pictograms. Applied Ergonomics, 58, 167–175. https://doi.org/10.1016/J.APERGO.2016.06.005

Nualdaisri, P., Corlett, S. A., & Krska, J. (2021). Provision and Need for Medicine Information in Asia and Africa: A Scoping Review of the Literature. Drug Safety, 44(4), 421–437. https://doi.org/10.1007/S40264-020-01038-8/METRICS

Patidar, P., Mathur, A., & Pathak, A. (2021). Can use of pictograms reduce liquid medication administration errors by mothers? An interventional study. BMC Psychology, 9(1), 1–10. https://doi.org/10.1186/S40359-021-00584-9/TABLES/5

Phimarn, W., Ritthiya, L., Rungsoongnoen, R., Pattaradulpithuk, W., & Saramunee, K. (n.d.). Research Paper Development and Evaluation of a Pictogram for Thai Patients with Low Literate Skills. Indian Journal of Pharmaceutical Sciences, 89. Retrieved July 6, 2023, from www.ijpsonline.com Roca, J., Tejero, P., & Insa, B. (2018). Accident ahead? Difficulties of drivers with and without reading impairment recognising words and pictograms in variable message signs. Applied Ergonomics, 67, 83–90. https://doi.org/10.1016/J.APERGO.2017.09.013

Rossete, C. A., & Ribeiro, M. G. (2021). Laboratory Technicians' Use and Interpretation of Hazard Communication Elements on Chemical Labels. https://doi.org/10.1021/acs.chas.0c00125

Saremi, M., Shekaripour, Z. S., Khodakarim, S., Saremi, M., Shekaripour, Z. S., & Khodakarim, S. (2020). Guessability of U.S. pharmaceutical pictograms in Iranian prospective users. Pharmacy Practice (Granada), 18(1). https://doi.org/10.18549/PHARMPRACT.2020.1.1705

Sletvold, H., Sagmo, L. A. B., & Torheim, E. A. (2020). Impact of pictograms on medication adherence: A systematic literature review. Patient Education and Counseling, 103(6), 1095–1103. https://doi.org/10.1016/J.PEC.2019.12.018

Tesfamariam, S., Anand, I. S., Kaleab, G., Berhane, S., Woldai, B., Habte, E., & Russom, M. (2019). Self-medication with over the counter drugs, prevalence of risky practice and its associated factors in pharmacy outlets of Asmara, Eritrea. BMC Public Health, 19(1), 1–9. https://doi.org/10.1186/S12889-019-6470-5/TABLES/3

Vaillancourt, R., Giby, C. N., Murphy, B. P., Pouliot, A., & Trinneer, A. (2019). Recall of Pharmaceutical Pictograms by Older Adults. The Canadian Journal of Hospital Pharmacy, 72(6), 454. https://doi.org/10.4212/cjhp.v72i6.2944

Vallance, K., Romanovska, I., Stockwell, T., Hammond, D., Rosella, L., & Hobin, E. (2018). "We Have a Right to Know": Exploring Consumer Opinions on Content, Design and Acceptability of Enhanced Alcohol Labels. Alcohol and Alcoholism, 53(1), 20–25. https://doi.org/10.1093/alcalc/agx068

Van Beusekom, M. M., Kerkhoven, A. H., Bos, M. J. W., Guchelaar, H.-J., & Van Den Broek, J. M. (2018). The extent and effects of patient involvement in pictogram design for written drug information: a short systematic review. Drug Discovery Today, 23(6). https://doi.org/10.1016/j.drudis.2018.05.013

Wu, K., Jin, X., & Wang, X. (2021). Determining University Students' Familiarity and Understanding of Laboratory Safety Knowledge-A Case Study. Journal of Chemical Education, 98(2), 434–438. https://doi.org/10.1021/ACS.JCHEMED.0C01142/ASSET/IMAGES/LARGE/ED0C01142_0003.JPEG

Zheng, Y., Tang, Y., Tseng, H. C., Chang, T. H., Li, L., Chen, P., Tang, Y., Lin, X. bin, Chen, X., & Tang, K. J. (2022). Evaluation of quality and readability of over-the-counter medication package inserts. Research in Social and Administrative Pharmacy, 18(9), 3560–3567. https://doi.org/10.1016/J.SAPHARM.2022.03.012