International Journal of Evaluation and Research in Education (IJERE)
Vol. 12, No. 3, September 2023, pp. 1155~1164
ISSN: 2252-8822, DOI: 10.11591/ijere.v12i3.25123

Teacher's perception on student's self-regulated learning in a technology-based learning setting

Deafey Majitol, Melor Md Yunus
Faculty of Education, Universiti Kebangsaan Malaysia, Bangi, Malaysia

Article Info

Article history:

Received Aug 2, 2022
Revised Jan 28, 2023
Accepted Mar 10, 2023

Keywords:

Education
Self-regulated learning
Systematic literature review
Teacher's perspective
Technology-based learning

ABSTRACT

It was inevitable that during the COVID-19 pandemic, various teaching and learning experiences were taken into virtual platforms. With the direct and total integration of technology in education during the pandemic, students had to rely mostly on their own self-regulated learning in order to progress in their learning. This systematic review explored teachers' perception on students' self-regulated learning (SRL) in a technology-based learning (TBL) setting. By using the preferred reporting items for systematic review and meta-analyses (PRISMA) 2020 as the review methodology, 39 articles were selected from the databases of ERIC and Google Scholars to complete this study. Findings revealed that teachers perceive the following factors to play a significant part for SLR and TBL to complement each other: i) Digital educational resources and accessibility for both teachers and students; ii) Teacher and student's readiness and competencies regarding technology-based learning; and iii) Parents' involvement in students' self-regulated learning for security and motivational purposes. It is believed that by implementing student-centered approach with the facilitation of various education stakeholders, students' learning can occur more effectively, purposeful and meaningful. Future research suggests an investigation on students' self-regulated learning from the perspective of parents and other related social issues.

Corresponding Author:

Deafey Majitol
Faculty of Education, Universiti Kebangsaan Malaysia
Bangi 43600, Selangor, Malaysia
Email: p112319@siswa.ukm.edu.my

1. INTRODUCTION

The use of the internet and technological devices in education were elevated to a whole new level when the COVID-19 disease hit the shore of every corner in the world. Due to how fatal and contagious the disease could get, the whole world resorted to a pandemic and many things were impaired; education being one of them. During the pandemic, the use of technological devices and online platforms were addressed tremendously with great and immediate efforts by many educators, parents and students alike. Such efforts had resulted in various pros and cons while certain terms and approaches that were once overlooked and deemed unpopular, had literally began to take over education by storm. For instance, the terms such technology-based learning (TBL) and self-regulated learning (SRL) among students.

Technology-based learning and self-regulated learning are two different terms that are moving side-by-side especially in education during the COVID-19 pandemic. It was inevitable and clear that these terms play significant roles in ensuring education can continue to carry on even when borders, gates and doors were closed to contain the COVID-19 disease. Additionally, the use of SRL in a TBL setting remained scarce and there are not many studies done on combining both terms, particularly in a large time frame such as the

pandemic. The pandemic managed to stretch an almost two-year time span for digital and virtual education to take place hence, the researcher believes that a collective study on what teachers think and perceive of such a condition should be comprehensively presented. Therefore, to collect and review a list of appropriate and significant articles pertaining the issues of TBL and what affect SRL among students during the pandemic, a SRL using the PRISMA 2020 checklist has been used to corroborate the study. A more detailed explanation on the matter is found in the methodology part in this paper.

One of the most significant terms to emerge about education during the pandemic, and possibly post-pandemic, is TBL. This term refers to the use of digital technologies and applications that allow electronic displays, storage and transmission of information to improve learning within a wide range of contexts [1], [2]. Besides that, TBL also serves as a great catalyst for effective, interactive and sustainable teaching and learning experiences [2]. A distinguished example of TBL would be the use of the internet to conduct teaching and learning processes such as online classes, the use of videos, digital audios, music and visuals for teaching and learning practices, digital applications such as social networking sites, e-dictionary, e-books and many more.

According to Martin *et al.* [3], initially, the suitability and appropriateness of TBL was leaning more towards older learners due to factors such as practicality, affordability and self-regulated learning. But considering the ill situation the world was facing, there were close to no other suitable and more effective methods for education to carry on besides taking or moving it to the virtual world. Nevertheless, the researcher agrees with a particular prior study stating that by integrating TBL into the teaching and learning routine, other forms and dimensions of education can be seen and achieved henceforth, transforming both teachers and students' roles significantly [3]. For instance, learning through the use of educational videos, preparing pre-recorded materials, manipulating moving images, virtual interactions such as comments, emojis, likes and dislikes, and many more. Therefore, education stakeholders such as teachers, parents and students should understand and admit that the digital setting of teaching and learning experiences is the new and probably the most effective way to maintain borderless and sustainable post-pandemic education.

Many schools across the globe were forced to close their gates and take education virtually using the internet. Online classes and digital connection between teachers, students, and parents were the only means for education and curriculum to flow during the pandemic. The use of technological devices and digital resources were apparent and widespread because that was deemed to be the quickest and effective solution for the then, emergency education. Due to the direct and total implementation of technology in education, teachers and students had to rely mostly on technological infrastructures, willingness to adapt technology into teaching and learning process, and the essential communication between teacher and parents [4].

Other than that, there was also the issue about schools in the rural areas which either have limited usage or access to technology-based education. Students who are able to access formal education through digital devices or otherwise were reported to have their own pros and cons. Most of the time, in the setting of technology-based education especially amidst a condition such as the pandemic, students were given the chance to self-regulate their learning and perhaps, learn even better [5]. But at the same time, attendance and motivational problems also emerged and became an issue in that particular period. Other contributing yet significant factors worth mentioning about schools during the pandemic is the lack of physical and social interaction between students which sometimes hinders mutual understanding, commitment and learning. There was a study suggesting that digitalized education like online classes, e-assessments and whatnot was not the proper solution as they were considered 'new' and impractical which resulted in the communities not preferring technology-based education; for instance, TBL [3]. Nevertheless, it is vital to understand that there are complementary terms and solutions for TBL to have a prevalent place in the post-pandemic education. With proper studies, education stakeholders and other affected community should see how schools during the pandemic were taken care of, and how the solutions bring about fruitful results for determining future educational trend and scenarios.

With the rapid advancement of technology-based education during the pandemic, a complementary term had also come into picture and that was students' SRL. Self-regulated learning can also be known as self-autonomous learning involving active processes among students that understand the concept of learning to learn whether it is a direct and conscious effort or otherwise [6]–[8]. The dominant features that identify SRL attributes among students are: i) the ability to realize one's responsibility in learning; ii) setting goals in learning; iii) controlling his or her emotions and behavior in learning tasks; and iv) openness to curiosity, autonomy and self-reflection during learning [7]–[9].

During the pandemic, SRL among students was viewed to be one of the most influential factors that contribute to the success of education flow. Most of online interactions and tasks assigned by teachers were done by students remotely in their own bedroom or respective houses where students would steer their own learning [10]. However, without physical connection and communication between both teachers and students, it was unlikely that students were truthfully participating and learning during online classes. So, how does

one tell if the students learned and participated in the lesson? One of the ways to tell was through their SRL characteristics like assignment submission, responsive two-way virtual communication and their interactive virtual exchanges in various online applications used by the teacher [9], [11]. According to previous studies [11]–[13], students who have good SRL attributes would most likely excel and benefit from online learning environment. Therefore, in order to achieve and embrace TBL as a potentially trendy yet significant part of post-pandemic educational scenario, students' SRL should be one of the imperative topics that should be focused on among education stakeholders.

To sum up, it is important to understand TBL and SRL before venturing into a 'new' and possible form of post-pandemic education. It is undeniable that the COVID-19 pandemic was an eye-opener on how crucial and significant TBL can be especially in the future times. In fact, it might be one of the ways to counter similar situations or other unprecedented circumstances that can restrict education flow from happening. To further explore the matter of TBL and SRL, a SLR was conducted based on the views and perspectives of teachers as a part of the effort to embrace post-pandemic educational scenarios. On a complementary side note as well, the purpose of this paper is also to set up a bench mark on how the topics of SRL and TBL are widely significant and discussed within the education field, especially during the COVID-19 circuit break. Not forgetting too, this paper attempts to contribute to a more comprehensive teachers' perception on the topic of SRL and TBL while predicting a more general yet common elements to look into when deciding a similar solution or perhaps, improved education in future times. All in all, this paper will be highlighting and answering on the following questions: i) What are teacher's perceptions on the factors affecting student's SRL in a TBL setting?; ii) What are teachers' perceptions on the effectiveness and the necessity of TBL in fostering SRL among students?

2. RESEARCH METHOD

This systematic literature review was done based on PRISMA 2020 checklist [14] together with the implementation of comparative research design. The PRISMA 2020 is a great tool to identifying reports, reviews, and results of particular articles for the purpose of selecting appropriately significant ones for the content of a SLR. As the aim of this paper was to investigate teachers' perception on students' SRL through the implementation of TBL, multiple sources of information from various references were analyzed and put together to describe an overall view and conclusion on the matter. By reviewing a filtered array of articles, the things that were mainly taken to describe teachers' perception were accessibility of digital educational resources, online teaching and learning competencies, and lastly, students' motivation and safety through parent's involvement. This paper also conceptually analyses the significant constructs and patterns that appeared within the pool of information to explain and predict how education directs and evolves itself through different dimensions. The entire process went through four phases: identification phase, screening phase, eligibility phase and inclusion phase. These phases will be further elaborated in the sub-sections.

2.1. Identifying phase

The selected electronic databases for this study were the education resources information center (ERIC) and Google Scholars. Both of these websites serve as safe electronic libraries for scholarly literatures which are free and accessible by students, teachers and researchers alike. There are tons of articles available from different publications, range of years, and other significant filters and such. For this paper, the search range was limited to a four-year range which was between the year 2019 to 2022. The keywords used to search for articles are shown in Table 1, while other additional yet significant criteria are shown in Table 2.

Table 1. Keywords used to search for related articles

Databases	Keywords
ERIC	("Student's self-regulated learning" OR "Technology-based learning" OR "online learning" OR "student's learning strategies" OR "student's online accessibility" OR "education during pandemic" OR "online methods") AND ("Teacher's perspective")
Google Scholar	("Student's self-regulated learning" OR "Technology-based learning" OR "online learning" OR "student's learning strategies" OR "student's online accessibility") AND ("Teacher's perspective")

Table 2. Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Type of article	Journal article	Book, book chapter, proceedings
Year	2019-2022	Years before 2019
Language	English	Non-English
Peer review	Peer-reviewed	Non-peer-reviewed
Perspective	Teachers	Parents, students, school leaders

2.2. Screening phase

During this phase, the identified articles will go through the process of eligibility. Before doing so, the articles were further screened to find duplicates and retrievable records. Duplicates are similar articles that can be found on multiple online scholarly libraries. These duplicates were identified and removed from the total number of articles found while the remaining ones were further examined to determine out-of-scope articles and retriable ones for the study.

The next process in the screening phase was the eligibility part. This was the process where the identified articles were further filtered based on criteria set in Table 2. By checking on the eligibility of the identified articles, data used for this study was ensured to be rigorous and more reliable. This was done by referring to the inclusion and exclusion part of the articles where criteria such as type of article, year, language, peer review and perspective were given close attention while reviewing the articles.

2.3. Inclusion phase

As for the inclusion phase, gathered articles must be journal article type, published within the four-year time frame of between 2019 and 2022, having or using English as the language of the article, been peer-reviewed and, viewed from the perspective of teachers. On the other hand, the excluded articles include those that were not journal articles such as books, book chapters, and proceedings. Articles that dated back before the year 2019 and those that were using other languages than English were also rejected. Finally, articles that were non-peer-reviewed and conducted from the perspective of students, parents and school administrators were excluded. A clearer representation of all the phases can be seen in Figure 1.

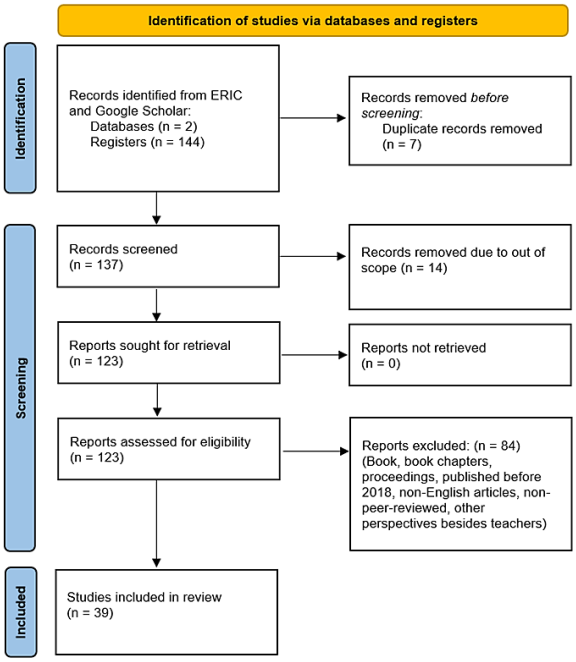

Figure 1. PRISMA systematic review [12]

3. RESULTS AND DISCUSSION

The result of this systematic literature review will be further elaborated in this section. After going through all of the four phases in selecting the appropriate articles for this study, various views from different research articles were put together to find consistent constructs and patterns to answer the research questions. Previously, there are many articles discussing on the matters of education during the pandemic. Nonetheless, after comparing all of the articles to one another, the profound points that occur across all of the selected articles include the accessibility of technological infrastructure, digital readiness and competencies among teachers and students, and parent's involvement in student's remote learning.

Based on Table 3, the ratio of articles discussing on the matter of accessibility, readiness and competency, and parent's involvement is 27, 32, and 16 respectively. Other than that, there is also the matter of effectiveness and necessity of technology integration as part of student's SRL in determining the trend of a post-pandemic education scenario. However, this particular construct was not included in the table as it does

not serve as a factor affecting student's SRL but rather, a general view on how teachers perceive the need for TBL to occur more in future times. Considering that the COVID-19 pandemic had 'coincidentally' enabled a massive use and shift of traditional face-to-face education to the virtual world, it is imperative to see and understand how the integration of technology shapes the post-pandemic education scenario among education stakeholders. Table 4 shows the breakdown of numbers of articles discussing on the effectiveness and necessity of TBL for student's SRL.

After identifying, analyzing, and comparing the content of each article, this section will provide a thorough discussion about the constructs and general teacher's perceptions on student's SRL as an effort to embrace a possible post-pandemic educational scenario. Additionally, one of the biggest results of the comparative study is almost all selected articles have a similarity on the factors affecting students' SRL in a TBL setting, specifically during the COVID-19 pandemic. This comparative study can be seen in Table 3 where it was identified, generalized and concluded significantly that the factors constantly affecting SRL in a TBL setting are the accessibility, competency and parent's involvement. Plus, this SLR presents a study on the significant link between TBL and SRL particularly in a big time-frame such as the pandemic. All in all, the factors which make up the whole study will be further elaborated with the focus specifically aimed on answering the two research questions identified for this paper.

Table 3. Aspect of teacher's perspective on the factors affecting student's SRL in a TBL setting

Study	Perspective		
	Accessibility	Readiness and competency	Parent's involvement
[15]	✓	✓	
[16]	✓	✓	
[17]	✓	✓	✓
[18]	✓		✓
[19]	✓	✓	
[20]		✓	
[21]	✓		✓
[22]	✓	✓	
[23]		✓	
[24]	✓		
[25]	✓	✓	
[26]	✓	✓	
[27]		✓	✓
[28]	✓	✓	
[29]	✓		✓
[30]		✓	✓
[31]	✓	✓	✓
[32]		✓	
[33]	✓	✓	
[34]		✓	
[35]		✓	
[36]		✓	
[37]		✓	✓
[38]	✓	✓	
[39]	✓		✓
[40]	✓		✓
[41]	✓	✓	
[42]		✓	✓
[43]	✓	✓	✓
[44]	✓	✓	✓
[45]	✓	✓	✓
[46]		✓	✓
[47]	✓	✓	
[48]	✓	✓	
[49]	✓	✓	✓
[50]	✓	✓	
[51]	✓		
[52]	✓	✓	
[53]		✓	

Table 4. Teacher's perspective on the effectiveness and need for TBL to foster student's SRL

Construct	Perspective	Number of research articles	Study
Effectiveness and necessity of TBL	Positive	27	[15], [18], [22]–[25], [27], [28], [30], [32]–[39], [41]–[44], [46]–[50], [52]
	Negative	1	[21]
	Mixed	7	[17], [19], [25], [29], [40], [45], [51]
	Not stated	4	[16], [20], [26], [31]

3.1. Research question 1: What are teacher's perceptions on the factors affecting student's SRL in a TBL setting?

During the COVID-19 pandemic, the use of TBL in various online platforms were tremendously addressed. Teachers and students agreed that there was no escaping the fact that education needed to shift from physical classes to virtual classes [15]–[17], [26], [29], [31], [47]. Due to such a condition, there were limitations that hindered learning from occurring within the normal norm such as physical interaction, face-to-face exchanges, doing collaborative hands-on work, and so many more. Students had no other choice than to stay at home and use any means necessary to catch up with their learning through the use of digital devices such as mobile phones, laptops and computers. On the other hand, teachers were also not able to present themselves virtually to really deliver knowledge and the necessary skills as clearly as possible compared to physical classes. This was where student's SRL came into the picture. Students on the other end of the line had to use their own methods of learning in order to get the best they could from online classes [17], [19], [35]–[41]. Furthermore, those papers suggested that student's SRL actually played a vital part in ensuring that what was delivered by teacher, was learned effectively by students regardless. Additionally, based on Table 3, there is a general pattern to what factors occur more prominently across all selected articles regarding the usage of TBL settings to foster education. These factors have been identified and characterized as accessibility, readiness and competency, and parent's involvement.

3.1.1. Accessibility to TBL and digital resources

Based on the result of the collected research articles, there was a total of 20 research articles that discussed the topic of accessibility. Accessibility in the term of student's SRL would simply mean student's capability to tap into a condition and acquire knowledge with or without the facilitation of a teacher or parent. If the scope was narrowed down within the idea of TBL, teachers, parents and schools were the ones responsible to create an environment for students to be well-accepting of the particular situation of the COVID-19 pandemic, and the shift to digital educational platforms is more vital than ever. Nonetheless, teachers perceive the accessibility to TBL and digital resources as important so that students can be easily stimulated, motivated and endorsed to participate in their learning be it directly or otherwise. Infrastructures, gadgets, internet connection, digital resources and teaching materials were some of the major factors that affect student's SRL in TBL [19], [26], [43]–[45], [48]–[52]. Furthermore, inadequate or unstable internet connection would hinder live-streamed lessons, absence of digital devices would demotivate students from attending online classes, little to less teaching and learning materials available online made learning dull and incomplete, rural places having no access to electricity let alone the internet, and so many more. Nevertheless, without the right accessibility to TBL and digital resources, student's SRL became a bit challenging to foster and that itself was a struggle on its own.

On the flip side, teachers also concluded that with proper and adequate accessibility to TBL and digital resources, student's SRL can manifest and became a profound matter in determining learning successes. Proper and adequate accessibility would involve stable internet connection among teacher and student during online class, free and retrievable learning resources such as videos, flashcards, exercises, digital textbooks, recordings and whatnot, and good electronic devices which are suitable for teaching and learning purposes. Regardless, a good accessibility to TBL played a significant part in promoting SRL among students. This finding is also consistent with [25], [26], [35], [43], [52] as student's experience better motivation, focus, comfort and understanding while learning online. Furthermore, students believe that the integration of technology and digital resources in their learning made them more motivated and interested in their learning [11], [17], [25].

3.1.2. Total TBL readiness and competencies among teachers and students

This is the most dominant construct that defines the factor affecting student's SRL in a TBL setting. The total research articles discussing on this matter is 31 out of the selected 36. It seemed like both students and teacher's readiness and competency in adapting technological devices in the teaching and learning experience was on a below average level [19], [22], [23], [30]–[38], [45]–[50]. This was due to the emergency distant learning conducted during the COVID-19 pandemic. Education stakeholders were seemingly shocked and unable to keep up with the massive and immediate use of the internet, electronic devices and overall, the implementation of TBL within the short amount of time. As education was considered 'stuck' during the earlier phase of the pandemic, and in many places as well, everyone was either in an unfamiliar or unsure state about what to do and what solution to take, moving forward. Moreover, the opportunities for both teachers and students to become comfortable with the implementation of TBL and student's SRL was also on a low to average level [22], [23], [26], [34], [41], [50], [53]. That was probably the reason why both parties were deemed underprepared and incompetent in dealing with online teaching and learning experiences.

Teacher's readiness and competency in the implementation of TBL revolved around pedagogy, methodology, materials, online platforms and overall management of digital devices in ensuring clear delivery and smooth flow of education. The subfactors affecting such a construct was teacher's computer skill, unwillingness to use and learn to use the technology, and online lesson delivery [9], [15], [22], [41]. All of these subfactors contribute to the effectiveness of online lesson and hence, promoting students to be more motivated, responsible and autonomous in their learning. For instance, teachers use live-streaming platforms such as Zoom and Google Meet only to talk, discuss and present the content of the knowledge with lesser or limited hands-on activities such as group work, manipulating various online applications for student's attraction, offline or asynchronous assignments, and many more. Besides that, teachers also struggled in time management and material preparations for online lesson, which often resulted in teachers forwarding ready-made materials produced by other educators and expected students to access the information and learn or complete tasks on their own [25], [53]. Noted that half of SRL also involves the supervision, support and monitoring of a teacher or parent. Students could not possibly steer their full learning on their own. Therefore, in order to foster good SRL among students, teachers perceive their pedagogy, methodology and competency in managing TBL to play a great role as well.

On the other hand, students' readiness and competency for tolerating and accepting TBL also contribute to this construct. Several studies [12], [22], [25], [26], [48] found that students faced organizational problems, planning skills, affordability, and technical issues such as connectivity, attendance and many more. Teachers believe that besides themselves, students also have the responsibility and initiative to adapt to the new environment of TBL during the pandemic so that 'school' could continue nonetheless. The problem with student's readiness and competency were the use and unfamiliarity of electronic devices specifically for learning purposes, facilities and access to the internet so that digital resources can be retrieved and sustained throughout their study, and production of digital results specifically for online assessments. When these conditions were not met, students could not include or gear themselves into the flow of SRL as their motivation and exposure for such a matter was on a low level. However, students of today would be the quickest to master the use of digital devices as they are considered to have high technical literacy and potential for SRL [12], [23], [35]. Therefore, when given adequate amount of time for familiarity and usage-wise of TBL, students would naturally tap into SRL and began to grow on their own pace.

3.1.3. Parent's involvement for security and motivational purposes

The final identified factor would be parent's involvement in the student's learning. There was a total of 16 out of 39 research articles discussing on the matter. In the setting of TBL during the pandemic, it was crucial to understand that learning happened remotely in student's respective houses. Most of the times, students had to do their own study with the assistance of electronic devices and their teachers through virtual meetings. Due to the nature of distant learning, teachers viewed their monitoring roles to be limited as they could not be physically present to enhance learning and motivate students on the spot. Everything was done virtually and perhaps nobody could really ensure that students were truly participating and indulging themselves into online classes. Hence, parents would have to be the ones to push, provide support and motivate students at home to learn even though some of them might not have the necessary methodology and pedagogy of a teacher in delivering lessons or knowledge.

Parent's involvement in filtering TBL risks at home and also providing the necessary encouragement for students is vital [29]–[31], [39], [43]–[46]. Parents could set time limitations for students when using digital devices, setting up passwords and online filters for dangerous or inappropriate web-searches, build student confidence through family activities, providing the necessary needs like comfortable space for learning, fulfilling the basic human needs like love, food and comfort, and many more. Once again, SRL among students does not simply mean that students do not receive support, guidance and information from their superiors but rather, taking everything given to them while they themselves decide on what is suitable, personalized and effective for them [9], [18], [27], [31], [37], [39], [42]–[46], [49]. All in all, in order to enhance SRL among students, especially in a TBL setting, teachers believe that parent's efforts and involvement could contribute to the success of such an approach.

3.2. Research question 2: What are teachers' perceptions on the effectiveness and the necessity of TBL in fostering SRL among students?

Among the 39 selected research articles, there was a total number of 36 that stated general thoughts of teachers regarding the effectiveness and necessity of TBL in conjunction to student's SRL. In efforts to predict the trend and post-pandemic education scenario, it is important to have a general view on teachers' opinion regarding the implementation of technology and use of internet in teaching and learning experiences. Overall, Table 4 explains the number of articles based on teacher's perspective whether TBL is effective and necessary for student's SRL or otherwise.

Generally, most of the research articles included in this systematic literature review reported teacher's positive views on how TBL can help to foster student's SRL. Teachers seemed to understand and accept that the advancement of technology and educational digital resources, methodology and platforms are growing more and more important nowadays. The trend of using electronic devices and also blended learning were widely accepted and studies have shown significant improvement from both teachers and students' ends [15], [17]–[25], [32]–[36], [47], [52], [53]. Besides that, teachers also believe that TBL serves as a vital necessity for student's SRL to bloom. Many agreed that student's learning nowadays has changed tremendously with the integration of technological devices especially mobile phones and tablets. Plus, these students are considered to be the new generation that possesses digital literacy by nature and not by conscious learning [25], [35], [47]. Therefore, it would only be a smart move to include e-learning, blended learning and basically, TBL to promote SRL among students [54]–[56].

Nevertheless, some of teacher's unique thoughts and views on the effectiveness and necessity of TBL for student's SRL are: i) TBL provides an organized learning process [25]; ii) Students can be independent and comfortable with the choice of place to study [35]; iii) Students can learn freely based on their own pace [35]; iv) Materials are retrievable and repeatable [35]; v) Students are less anxious while learning [35]; vi) TBL is economical, sustainable and environment-friendly [43]; and vii) TBL provides new teaching and learning styles and innovation among teachers and students [52].

4. CONCLUSION

The study investigated the overall teacher perception on the effectiveness and necessity of TBL to promote student's SRL. Based on the included articles in this study, 69.23% agreed that TBL is effective and necessary to foster student's SRL, while 17.95% reported a mixed perception between positive and negative, and 2.56% reported to disagree that TBL is significant for future post-pandemic education. Nevertheless, there is a general perception that TBL is effective and necessary because it promotes comfortable learning, economical and sustainable teaching and learning approaches, and innovative teaching and learning styles.

Although this paper has presented a general teacher's perspective on the topic, there were limitations encountered, nonetheless. A part of them would be the source of research articles. The reviewed articles come from two databases which are ERIC and Google Scholar. There are other sources of research articles available from different online scholarly libraries such as Scopus and Web of Science (WoS). Should this topic be enhanced and seen from a greater number of research articles, other sources of articles should definitely be added into the list of sources. Besides that, the authors find the implementation of TBL and student's SRL to appear around schools of different streams be it primary, secondary, tertiary or even pre-schools. However, to provide a general view on the matter, the authors decided not to narrow the scope into a particular stream of school while suggesting other interested researchers to do the opposite.

As for recommendation, there should be more research done on the suggestions of appropriate amount of time and devices used for educational purposes. Besides, there should also be better awareness and trainings for various education stakeholders to greatly recognize TBL and student's SRL in efforts to embrace a sustainable form of education. Last but not least, an investigation on students' SRL can perhaps be explored from the perspective of parents and related issues like finance, society and educational cultures.

ACKNOWLEDGEMENTS

All authors would like to thank Universiti Kebangsaan Malaysia for sponsoring this research under the research grant number GG-2020-024.

REFERENCES

[1] A. K.-Yeboah, A. Sallar, L. K. Kiramba, and Y. Kim, "Exploring the Use of Digital Technologies from the Perspective of Diverse Learners in Online Learning Environments," *Online Learning Journal*, vol. 24, no. 4, pp. 42–63, 2020, doi: 10.24059/olj.v24i4.2323.

[2] E. B. Yazici and M. A. Özerbaş, "The Analysis of the Efficiency of Digital Education Platforms Based on Various Variables," *Participatory Educational Research*, vol. 9, no. 3, pp. 383–402, 2022, doi: 10.17275/per.22.72.9.3.

[3] F. Martin, T. Gezer, J. Anderson, D. Polly, and W. Wang, "Examining Parents Perception on Elementary School Children Digital Safety," *Educational Media International*, vol. 58, no. 1, pp. 60–77, Jan. 2021, doi: 10.1080/09523987.2021.1908500.

[4] J. Delcker and D. Ifenthaler, "Teachers' perspective on school development at German vocational schools during the Covid-19 pandemic," *Technology, Pedagogy and Education*, vol. 30, no. 1, pp. 125–139, 2021, doi: 10.1080/1475939X.2020.1857826.

[5] R. Palau, M. Fuentes, J. Mogas, and G. Cebrián, "Analysis of the implementation of teaching and learning processes at Catalan schools during the Covid-19 lockdown," *Technology, Pedagogy and Education*, vol. 30, no. 1, pp. 183–199, 2021, doi: 10.1080/1475939X.2020.1863855.

[6] S. P. Karunanayaka and W. M. S. Weerakoon, "Fostering Digital Education among Teachers and Learners in Sri Lankan Schools," *Journal of Learning for Development*, vol. 7, no. 1, pp. 61–77, 2020, doi: 10.56059/jl4d.v7i1.390.

[7] W. C. Brandt, "Measuring Student Success Skills: A Review of The Literature on Self-Directed Learning," National Center for the Improvement of Educational Assessment, 2020. [Online]. Available: https://www.nciea.org/library/measuring-student-success-skills-a-review-of-the-literature-on-self-directed-learning.
[8] S. L. Lim and K. J. Yeo, "A systematic review of the relationship between motivational constructs and self-regulated learning," *International Journal of Evaluation and Research in Education (IJERE)*, vol. 10, no. 1, pp. 330–335, 2021, doi: 10.11591/ijere.v10i1.21006.
[9] F. N. P. Pazilah, H. Hashim, and M. M. Yunus, "Using Technology in ESL Classroom: Highlights and Challenges," *Creative Education*, vol. 10, no. 12, pp. 3205–3212, 2019, doi: 10.4236/ce.2019.1012244.
[10] M. M. Yunus, "Innovation in Education and Language Learning In 21st Century," *Journal of Sustainable Development Education and Research (JSDER)*, vol. 2, no. 1, pp. 33–34, 2018, doi: 10.17509/jsder.v2i1.12355.
[11] K. Karatas and I. Arpaci, "The Role of Self-directed Learning, Metacognition, and 21st Century Skills Predicting the Readiness for Online Learning," *Contemporary Education Technology*, vol. 13, no. 3, 2021, doi: 10.30935/cedtech/10786.
[12] S. Dewie, H. Norman, and M. Md. Yunus, "Boosted with Online Learning to Improve English Language Teachers' Proficiency," *Arab World English Journal (AWEJ)*, vol. 12, no. 3, pp. 507–523, 2021, doi: 10.24093/awej/vol12no3.34.
[13] H. Hashim, M. M. Yunus, M. A. Embi, and N. A. M. Ozir, "Mobile-assisted Language Learning (MALL) for ESL Learners: A Review of Affordances and Constraints," *Sains Humanika*, vol. 9, no. 1–5, 2017, doi: 10.11113/sh.v9n1-5.1175.
[14] B. Flynn, M. Pagell, and B. Fugate, "Editorial: Survey Research Design in Supply Chain Management: The Need for Evolution in Our Expectations," *Journal of Supply Chain Management*, vol. 54, no. 1, pp. 1–15, 2017, doi: 10.1111/jscm.12161.
[15] G. N. Hafifah, "Teachers Perspectives of ICT Integration in English Language Teaching: A Review of Literature," *Journal of English Educators Society (JEES)*, vol. 5, no. 1, pp. 9–15, 2020, doi: 10.21070/jees.v5i1.205.
[16] O. Kalimullina, B. Tarman, and I. Stepanova, "Education in the Context of Digitalization and Culture: Evolution of the Teacher's Role, Pre-pandemic Overview," *Journal of Ethnic and Cultural Studies*, vol. 8, no. 1, pp. 226-238, 2020, doi: 10.29333/ejecs/629.
[17] A. Alzahrani, "Online learning during the Covid-19 Pandemic: A review of literature," *Amazonia Investiga*, vol. 11, no. 50, pp. 188–203, 2022, doi: 10.34069/AI/2022.50.02.19.
[18] R. P. Rahayu and Y. Wirza, "Teachers' Perception of Online Learning during Pandemic Covid-19," *Jurnal Penelitian Pendidikan*, vol. 20, no. 3, pp. 392–406, Dec. 2020, doi: 10.17509/jpp.v20i3.29226.
[19] O. M. Auma and O. J. Achieng, "Perception of Teachers on Effectiveness of Online Learning in the wake of COVID-19 Pandemic," *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, vol. 25, no. 6, pp. 19–28, 2020.
[20] N. Almazova, E. Krylova, A. Rubtsova, and M. Odinokaya, "Challenges and Opportunities for Russian Higher Education amid COVID-19: Teachers' Perspective," *Education Sciences*, vol. 10, no. 12, 2020, doi: 10.3390/educsci10120368.
[21] L. Faridah *et al.*, "Experiences and Challenges of Distance Learning During Covid-19 Pandemic from Educators' Point of View: A Review," *Education Quarterly Reviews*, vol. 4, no. 3, pp. 468–483, 2021, doi: 10.31014/aior.1993.04.03.354.
[22] D. Nambiar, "The impact of online learning during COVID-19: students' and teachers' perspective," *International Journal of Indian Psychology*, vol. 8, no. 2, pp. 783–793, 2020.
[23] M. Li and Z. Yu, "Teachers' Satisfaction, Role, and Digital Literacy during the COVID-19 Pandemic," *Sustainability*, vol. 14, no. 3, Jan. 2022, doi: 10.3390/su14031121.
[24] M. Muhammad, "Promoting Students' Autonomy through Online Learning Media in EFL Class," *International Journal of Higher Education*, vol. 9, no. 4, pp. 320–331, Jul. 2020, doi: 10.5430/ijhe.v9n4p320.
[25] F. Karakaya, S. Arik, O. Çimen, and M. Yilmaz, "Investigation of the views of biology teachers on distance education: The case study of COVID-19 Pandemic," *Journal of Education in Science, Environment and Health*, vol. 6, no. 4, pp. 246–258, 2020, doi: 10.21891/jeseh.792984.
[26] Mailizar, A. Almanthari, S. Maulina, and S. Bruce, "Secondary School Mathematics Teachers' Views on E-learning Implementation Barriers during the COVID-19 Pandemic: The Case of Indonesia," *EURASIA Journal of Mathematics Science Technology Education*, vol. 16, no. 7, May 2020, doi: 10.29333/ejmste/8240.
[27] G. Kalayci and H. Ergül, "Teachers' perceptions of the role of parental involvement in teaching English to young learners," *Journal of Language and Linguistic Studies*, vol. 16, no. 3, pp. 1167–1176, 2020, doi: 10.17263/jlls.803608.
[28] M. F. Rice and K. R. Ortiz, "Perceptions of Accessibility in Online Course Materials: A Survey of Teachers from Six Virtual Schools," *Journal of Online Learning Research*, vol. 6, no. 3, pp. 245–264, 2020, [Online]. Available: https://www.learntechlib.org/primary/p/217628.
[29] E. Aydin and S. Erol, "The Views of Turkish Language Teachers on Distance Education and Digital Literacy during Covid-19 Pandemic," Interna*tional Journal of Education and Literacy Studies (IJELS)*, vol. 9, no. 1, pp. 60–71, 2021, [Online]. Available: http://journals.aiac.org.au/index.php/IJELS/article/view/6476/4526.
[30] E. B. Ozdemir, "Views of Science teachers about online STEM practices during the COVID-19 period," *International Journal of Curriculum and Instruction*, vol. 13, no. 1, pp. 854–869, 2021.
[31] T. Aytaç, "The Problems Faced by Teachers in Turkey During the COVID-19 Pandemic and Their Opinions," *International Journal of Progressive Education (IJPE)*, vol. 17, no. 1, pp. 404–420, 2021, doi: 10.29329/ijpe.2021.329.26.
[32] E. B. Mikušková and M. Verešová, "Distance Education During Covid-19: The Perspective of Slovak Teachers," *Problems of Education in the 21st Century*, vol. 78, no. 6, pp. 884–906, 2020, doi: 10.33225/pec/20.78.884.
[33] H. D. C. Priyadarshani and D. Jesuiya, "Teacher's Perception on Online Teaching method during Covid-19: With Reference to School Level Teachers at Faculty of Education, The Open University of Sri Lanka," *Shanlax International Journal of Education*, vol. 9, no. 2, pp. 132–140, 2021, doi: 10.34293/education.v9i2.3662.
[34] H. Erol, "Views of Social Studies Teachers on E-Learning," *International Education Studies*, vol. 14, no. 6, pp. 82–91, 2021, doi: 10.5539/ies.v14n6p82.
[35] I. Fitriyah and M. Jannah, "Online Assessment Effect in EFL Classroom: An Investigation on Students and Teachers' Perceptions," *Indonesian Journal of English Language Teaching and Applied Linguistics*, vol. 5, no. 2, pp. 265–284, 2021, doi: 10.21093/ijeltal.v5i2.709.
[36] L. J. R.-Muñiz, D. Burón, Á. A.-González, and L. M.-Rodríguez, "Secondary Mathematics Teachers' Perception of Their Readiness for Emergency Remote Teaching during the COVID-19 Pandemic: A Case Study," *Education Sciences*, vol. 11, no. 5, 2021, doi: 10.3390/educsci11050228.
[37] I. A.-Mulet, M. J. I.-Martínez, and I. L.-Cabezas, "Teachers' Beliefs about the Role of Digital Educational Resources in Educational Practice: A Qualitative Study," *Education Sciences*, vol. 11, no. 5, 2021, doi: 10.3390/educsci11050239.
[38] T. Dhurumraj, S. Ramaila, F. Raban, and A. Ashruf, "Broadening Educational Pathways To Stem Education Through Online Teaching And Learning During Covid-19: Teachers' Perspectives," *Journal of Baltic Science Education (JBSE)*, vol. 19, no. 6A, pp. 1055–1067, Dec. 2020, doi: 10.33225/jbse/20.19.1055.

[39] B. W. Pratolo and H. A. Solikhati, "Investigating teachers' attitude toward digital literacy in EFL classroom," *Journal of Education and Learning (EduLearn)*, vol. 15, no. 1, pp. 97–103, Feb. 2021, doi: 10.11591/edulearn.v15i1.15747.
[40] Ö. Şanli, "English Teachers' Views on Distance Education in the COVID-19 Pandemic Process," *Education Quarterly Reviews*, vol. 4, pp. 339–353, 2021, doi: 10.31014/aior.1993.04.02.250.
[41] R. Khan, B. L. Basu, A. Bashir, and M. E. Uddin, "Online Instruction during COVID-19 at Public Universities in Bangladesh: Teacher and Student Voices," *The Electronic Journal for English as a Second Language*, vol. 25, no. 1, pp. 1–27, 2021. [Online]. Available: https://tesl-ej.org/wordpress/issues/volume25/ej97a/ej97a19.
[42] F. Seabra, A. Teixeira, M. Abelha, and L. Aires, "Emergency Remote Teaching and Learning in Portugal: Preschool to Secondary School Teachers' Perceptions," *Education Sciences*, vol. 11, no. 7, Jul. 2021, doi: 10.3390/educsci11070349.
[43] S. Karagöz and M. E. Rüzgar, "An investigation of the prospective teachers' viewpoints about distance education during the COVID-19 pandemic," *International Journal of Curriculum and Instruction (IJCI)*, vol. 13, no. 3, pp. 2611–2634, 2021. [Online]. Available: http://ijci.wcci-international.org/index.php/IJCI/article/view/742/376.
[44] Ibrohim, A. K. Sudrajat and M. Saefi, "Assessing Indonesian Teacher's Perspective on the Implementation of Distance Learning due to COVID-19 Based on Online Survey," *Journal of Turkish Science Education*, vol. 18, pp. 46–59, 2021.
[45] Y. Tas, S. Eminoglu, G. Atila, Y. Yildiz, and U. Bozkurt, "Teachers' Self-Efficacy Beliefs and Opinions About Distance Education During the Covid-19 Pandemic," *Turkish Online Journal of Distance Education*, vol. 22, no. 4, pp. 229–253, 2021, doi: 10.17718/tojde.1002868.
[46] T. Barabási, "The Situation of Online Preschool 'Learning' from Early Childhood Teachers' Perspective," *Acta Didactica Napocensia*, vol. 14, no. 2, pp. 216–229, 2021.
[47] E. A. Sorokoumova, E. B. Puchkova, E. I. Cherdymova, and L. V. Temnova, "Teachers' perspectives on digitalized education and deterrents to the use of digital products in educational processes," *Cypriot Journal of Educational Sciences (CJES)*, vol. 16, no. 5, pp. 2677–2689, 2021, doi: 10.18844/cjes.v16i5.6356.
[48] J.-C. Mateus, P. Andrada, C. G.-Cabrera, C. Ugalde, and S. Novomisky, "Teachers' perspectives for a critical agenda in media education post COVID-19. A comparative study in Latin America," *Comunicar: Revista Científica de Comunicación y Educación*, vol. 30, no. 70, pp. 9–19, Jan. 2022, doi: 10.3916/C70-2022-01.
[49] S. Taimur, H. Sattar, and E. Dowd, "Exploring teachers' perception on successes and challenges associated with digital teaching practice during COVID-19 pandemic school closures," *Pedagogical Research*, vol. 6, no. 4, 2021, doi: 10.29333/pr/11253.
[50] E. P. Yildiz, "Determining the Views of Teachers on the Transition to Digital Transformation in Education During the Pandemic Process: A Case Study," *Journal of Education and Learning (JEL)*, vol. 10, no. 6, pp. 92–102, 2021, doi: 10.5539/jel.v10n6p92.
[51] A. Badran, L. Eid, H. Abozaied, and N. Nagy, "Egypt's ICT Reform: Adoption Decisions and Perspectives of Secondary School Teachers During COVID-19," *AERA Open*, vol. 7, 2021, doi: 10.1177/23328584211042866.
[52] Y. Alolaywi, "Teaching online during the COVID-19 pandemic: Teachers' perspectives," *Journal of Language and Linguistic Studies (JLLS)*, vol. 17, no. 4, pp. 2022–2045, 2021, doi: 10.52462/jlls.146.
[53] R. Koris and Á. Pál, "Fostering learners' involvement in the assessment process during the COVID-19 pandemic: Perspectives of university language and communication teachers across the globe," *Journal of University Teaching & Learning Practice (JUTLP)*, vol. 18, no. 5, 2021, doi: 10.53761/1.18.5.11.
[54] L. Fuller, "Negotiating a New Blend in Blended Learning: Research Roots," *Inquiry: The Journal of the Virginia Community Colleges*, vol. 24, no. 1, 2021. [Online]. Available: https://commons.vccs.edu/inquiry/vol24/iss1/6.
[55] B. Ghimire, "Blended Learning in Rural and Remote Schools: Challenges and Opportunities," *International Journal of Technology in Education* (*IJTE*), vol. 5, no. 1, pp. 88–96, 2022, doi: 10.46328/ijte.215.
[56] E. Castro and J. George, "The Impact of COVID-19 on Student Perceptions of Education and Engagement," *e-Journal of Business Education & Scholarship of Teaching*, vol. 15, no. 1, pp. 28–39, 2021.

BIOGRAPHIES OF AUTHORS

Deafey Majitol is an English teacher in Sekolah Jenis Kebangsaan Cina (SJKC) Chi Wen, Federal Territory of Labuan, Malaysia. He graduated from the Institute of Teacher Education Gaya Campus, Kota Kinabalu, Sabah with a Bachelor's Degree in TESL. At the moment, he is pursuing his Master's Degree in the National University of Malaysia (UKM). His research interests include the teaching and learning of English through interactive and communicative approaches, particularly in the use of literature and game-like activities. He can be contacted at email: p112319@siswa.ukm.edu.my.

Melor Md Yunus is a Professor of English Language Education and Innovative Pedagogies and currently is a Deputy Dean of Research and Innovation at the Faculty of Education, Universiti Kebangsaan Malaysia. She is best known for establishing the integration of ICT in teaching and learning English as a Second Language research. She is active in scholarly journal writing and publishing and has currently published more than 500 papers in Citation-Indexed journals particularly WoS and Scopus. Her publications are on the integration of ICT in teaching and learning English as a Second Language, Technology-enhanced Language Learning (TELL), Computer-assisted Language Learning (CALL) and Innovative Pedagogies. She can be contacted at email: melor@ukm.edu.my.