

Parental involvement in monitoring foundation students' online learning in Malaysia

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ABSTRACT

This study examined the parental involvement in monitoring their children online learning at foundation level through the parents' perspectives, challenges and satisfaction. In addition, this study explored the relationship between parent's perspectives on student's online learning and parents' demographic information (number of households, household income, and education level). This study employed a cross-sectional survey design, where a questionnaire was used for data collection. A total of 276 samples were selected randomly from parents who enrolled their children at a foundation center in a selected year. Data of the study were analyzed through descriptive (mean, standard deviation, percentage) and inferential statistics (Sperman's correlation) using SPSS version 23. The findings of the study showed that majority of the parents have positive perspectives and high satisfactions towards involvement in monitoring foundation students' online learning at home. The findings also revealed a strong positive correlation between parental perspectives towards involvement in monitoring foundation student's online learning and household income as well as parents' education level. The outcome of the study highlighted the parental readiness and awareness in their role in monitoring students' online learning in tertiary education level while also providing awareness to educators on its importances and challenges in their online learning classes.

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1. INTRODUCTION

Parents and academic institutions are recognized to have an impact on the development of children's formal and informal education, as both two forms of guidance cumulatively influence and structure the children's fundamental learning [1]. Parents play a significant role in students' educational development as it is understandable that children spend more time with their parents at home compared to schools or other educational institutes. The role of a parent is a continuous endeavor that necessitates being attentive and adaptable to address the constantly changing demands of a child [2]. In learning, parents play a vital role as a supportive factor towards student's motivation and achievement [3]. Active parent's involvement can influence positive learning behavior of students through proper guidance and serve as a reinforcement towards the learning process. Parents as the most influential person for the student will have a substantial impact towards student's education [4]. In addition, collaboration between educators and parents are found to have a positive impact towards the academic achievement of a student [5]. According to Ayimbila *et al.* [6], parental involvement helps parents and educators to build a good relationship, which enables them to share

ideas on how to contribute their quota for the development of the school and community. Educators need to facilitate learning for many students through a more general approach, whereas parents understand their children best and can give a more personalized approach and attention. This however tends to be overlooked as many parents hold school accountable towards their children academic performance [1].

With unforeseen events that may interrupt face-to-face classes, many educators rely heavily on online learning as an alternative solution to ensure the continuation of the teaching and learning process. Although online learning has many advantages for the process, it also has its fair shares of challenges. Students' participation and motivation in online learning sessions are among the major concerns for educators as online learning consumption is happening beyond the campus environment. Learning through online medium is not a new concept and is widely applied especially for long distance learning [7]. Blended learning is the main choice as it combines both the strength of traditional face-to-face learning and online learning [8]. With the recent pandemic situation, majority of students must rely solely on online learning to pursue their education [9]. Although online learning is good at certain aspects of learning such as personalization and availability [10], it is however quite limited in terms of student's participation and learning motivation [11]. This is due to reduced monitoring from educators compared to face-to-face learning while at the same time being in a disjointed environment [12].

One way to remedy the situation is to rely on parental involvement at home to help educators monitor the students' engagement in online learning. Parental involvement in education is not new as most parents have been responsible for their children's education directions and achievements since school level. According to Wang [13], parental involvement in monitoring is important to parents' capacity to control their child's media exposure, establish study and homework time, assist in subject selection, regulate playtime, and supervise their child's return from school. Parents are also deemed trustworthy figures and share the same objective with the student, making them a perfect mediator between educators and students. While most research on parental involvement are on primary and secondary schools, there are limited research focused on parental involvement in students' education foundation and tertiary level. Even though students at foundation and tertiary level are considered as more mature and independent compared to primary and secondary school students, it is interesting to examine parents' perspectives, challenges and satisfactions on involvement in monitoring their children learning especially on online learning.

According to the discussion, this study therefore aims to examine parental perspectives, challenges and satisfactions towards involvement in monitoring their children online learning in foundation. In addition, this study explored the relationship between parent's perspectives on student's online learning and parents' demographic information (number of households, household income, and education level). More specifically, it will address the following research questions:

- i) What is the parents' role in involvement and monitoring time for the foundation students' online learning at home?
- ii) What are the parents' perspectives towards involvement in monitoring the foundation students' online learning at home?
- iii) What are the parents' challenges towards involvement in monitoring the foundation students' online learning at home?
- iv) What are the parents' satisfactions towards involvement in monitoring the foundation students' online learning at home?
- v) Is there a relationship between parents' perspectives and parents' demographic information (number of households, household income and education level)?

By conducting this study, it provides an opportunity for educator to understand the level of readiness and willingness of parental involvement in monitoring their children's online learning at foundation level, allowing educators to plan and prepare collaboration with parents with the main goal to ensure students continue to participate and motivate in the online learning session. In addition, the study provides an insight in understanding the indicators that facilitate the reliance of parents' involvement in monitoring the students' online learning at foundation level.

The term "parental involvement" in students' learning can be defined in various approaches. Parental involvement can be defined as an active role played by families and communities to foster an encouraging environment for children's learning [14]. Shimi *et al.* [15] specified parental involvement as the degree of parental engagement in their child's home education and the frequency of communication with the school. Likewise, Salac and Florida [16] defined parental involvement as an engagement and communication among parents and educators, which includes discussion about the students' homework and school experiences, as well as conversations about adjusting the students' learning activities at home and school.

With these various definitions, Liu and Gao [17] summarized parental involvement learning into two main dimensions: home-based involvement and school-based involvement. According to research by Kamal *et al.* [18], home-based involvement pertains to parents actively aiding and bolstering their children's learning, whereas school-based involvement refers to parents' participation in school-related activities, such

as parent-teacher associations (PTA). Epstein [5] further categorized parental involvement into six dimensions, which are parenting, communicating, volunteering, learning at home, decision making and collaborating with the community. Thartori [1] stated that identifying these six dimensions will ensure researchers to gain a deeper and more logical understanding of the nature of parental involvement.

There is no doubt that parental involvement in students' learning at home offers various advantages for both the students and educators. Extensive evidence consistently demonstrates that active parents who dedicate significant amount of time and resources to their children's education, such as helping with homework, will yield academically successful children and cultivate a more robust school-family relationship [6]. Virtudazo *et al.* [19] highlighted that parents contribute towards the improvement of students' academic performances and grades in school by giving high moral support to their children's learning. Besides that, active parental involvement in student's learning can also lead to better relationships between parents and educators, in addition to enhancing the educator's morale and fostering a positive school climate [17]. Ayimbila *et al.* [6] stated that the improved parents-educator relationship enables them to exchange ideas on how to make their respective contributions towards the advancement of the school and community.

In addition, research has shown that support from parents is not only important for students in schools' level, but the positive impact continues towards older students in tertiary education level. Parents typically demonstrate a strong inclination to engage in their children's higher education [20]. According to Weathers-Fincher [21] study, active parental involvement will facilitate the enhancement of students' academic achievements, interpersonal communication, and knowledge linkage between high schools and higher education. Parental engagement is crucial in providing necessary emotional support for students when they move from high school to university education as this support helps to motivate and encourage students to embrace the challenges of higher learning, rather than limiting their aspirations [20].

While there are benefits in parental involvement towards students' learning, educators must aware that there are still some challenges that need to be addressed. According to Yulianti *et al.* [22], parents, particularly those with limited educational backgrounds, often exhibit lower levels of confidence when it comes to engaging in their children's learning. This is because the parents possess limited knowledge and unsure to assistance with the children learning at home [17]. This is corroborated by Handayani *et al.* [23], which findings showed a strong positive correlation between the educational level of parents and all aspects of parental involvement in their children's education.

In addition to parental educational background, financial background also plays a significant role in parental involvement in students' learning. Osaro-Martins [24] discovered that financial constraints experienced by parents can result in reduced parental involvement in their children's education both at school and at home. Working-class parents, especially with financial struggle, will prioritize their time to fulfil their children's basic needs such as shelter and food [22]. Parents with lower-income households will encounter various obstacles to involvement in their children's education, such as transportation issues, strict working hours, insufficient financial funds, and stress resulting from living in underprivileged areas [25].

Language barriers also present a challenge for parental involvement in their children' education. Murshidi *et al.* [26] stated that parents desire to assist their children's learning but are hindered to due to low comprehension of the English language. Poor proficiency in the English language leads to less parental confidence in helping their children with homework, resulting in less parental involvement in school [27]. Furthermore, the presence of a language barrier can impede the establishment of an effective collaboration between educators and parents, and it was observed in the study conducted by Perrigo *et al.* [28], where the level of parental involvement in Latino immigrant households was found to be significantly affected by issues related to communicating with school.

2. METHOD

2.1. Research design and samples

This study employed a cross-sectional survey design, which was designed to collect information regarding to parents' perspectives, challenges and satisfactions towards involvement in monitoring their children online learning at home. The data of the study was obtained from 276 parents, randomly selected from a total of 966 parents whose children were studying in a foundation center in Malaysia. All samples were randomly selected through simple random sampling, without based on any certain set of criteria to avoid any bias in the findings. The sample size was calculated via the Raosoft sample size calculator, with a confidence level of 95%. Prior to the study, a letter of consent for the study was sent to both the foundation center and the participating parents to obtain necessary approvals and clearances for the study.

The foundation program is a one-year (two semester) program with the goal to provide essential knowledge to prepare students for undergraduate programs in the university. This study was conducted during the post COVID-19 pandemic, where the foundation center still conducted all face-to-face lectures

and activities via asynchronous online session. All the students were studying and completing the program at their respective home.

2.2. Data instrument

The questionnaire used in this study was adapted from Rathaliya *et al.* [29] research and consisted of five main sections:

- i) The first section is related to parents' demographic information, such as gender, age, number of households, household income, and education level.
- ii) The second section focused on parental roles in involvement and monitoring foundation students' online learning and consisted of two items structured around parental roles (involvement and monitoring time).
- iii) The third section, which focused on parent's perspectives towards involvement in monitoring foundation students' online learning, consisted of 16 items structured around six domains (safety, content delivery, evaluation, social relationship, internet addiction, and health effects). The measurement of items is conducted using a Likert scale consisting of five levels, ranging from 1 (strongly disagree) to 5 (strongly agree). The parents' perception will be examined using the median score. Positive perception will be considered if the score falls between 44 and 80, while negative perception will be considered if the score falls between 16 and 43.
- iv) The fourth section, which aimed to access parents' challenges towards involvement in monitoring foundation students' online learning, consisted of 12 items structured around three domains (personal, technological, and economic). The measurement of items is conducted using a Likert scale consisting of five levels, ranging from 0 (never) to 4 (always). The parents' challenges on student' learning will be evaluated based on the following categories: no or minimal burden (≤ 12), mild to moderate (13–24), moderate to severe (25–36), and severe burden (37–48).
- v) The fifth section is related to parents' satisfaction towards involvement in monitoring foundation students' online learning. The measurement of items is conducted using a Likert scale consisting of five levels, ranging from 1 (strongly dissatisfied) to 5 (strongly satisfied). Parents' satisfaction towards foundation students' online learning will be evaluated based on the categories: low (≤ 12), moderate (13–25), high (26–38), and extreme (39–50).

2.3. Reliability and validity of the instrument

A pilot study was conducted to a group of parents whose children had completed their foundation program in the center the previous year. It was noted that during that time, the center has also conducted the foundation program via online. The reliability of the questionnaire was determined via Cronbach's alpha coefficient reliability test, where the result showed that items in the questionnaire were high reliable and internal consistency (Cronbach's alpha=0.951). In addition, bivariable correlate analysis also been conducted to test the validity of items in the questionnaire, and it indicated that all items were valid ($p < 0.05$).

2.4. Procedure and data analysis

This study began by providing students with a brief description on the main objectives of the study. The questionnaire was distributed both in physical form as well as online using Google Form to the students, alongside guidelines for them to request their parents in completing of the questionnaires. All the questionnaire items were processed and analyzed through descriptive statistics (mean, percentage, and standard deviation) and inferential statistics (Spearman's correlation) using statistical packages for social sciences (SPSS) version 23.

3. RESULTS AND DISCUSSION

3.1. Demographic information of the study

Table 1 shows the demographic information of the sample of the study. Based on Table 1, it showed that 97 (35.1%) of the parents were male and 179 (64.9%) were female. Majority of the parents' age comprised of 40–49 years old ($N=134$, 48.6%), followed by 50–59 years old ($N=118$, 42.8%), 60–69 years old ($N=14$, 5.1%) and 30–39 years old ($N=10$, 3.6%). In addition, majority of the samples consisted of more than 5 people ($N=119$, 43.1%), followed by 5 people ($N=79$, 28.6%), 4 people ($N=46$, 16.7%), 3 people ($N=21$, 7.6%) and 2 people ($N=11$, 4.0%). Based on the household income, majority of the parents earned RM5000–RM7499 ($N=66$, 23.9%). This was followed by parents who earned more than RM9999 ($N=64$, 23.2%), less than RM2500 ($N=54$, 19.6%) and RM7500–RM9999 ($N=33$, 12.0%). For the parents' education level, it showed that majority of the parents have high school qualifications ($N=167$, 60.5%), followed by university/college qualifications ($N=95$, 34.4%) and primary school qualifications ($N=14$, 5.1%).

Table 1. Demographic information of the sample of the study

Demographic information		N	%	Cumulative (%)
Gender	Male	97	35.1	35.1
	Female	179	64.9	100.0
Age	30–39	10	3.6	3.6
	40–49	134	48.6	52.2
	50–59	118	42.8	94.9
	60–69	14	5.1	100.0
	More than 69	0	0.0	100.0
Number of households	2 people	11	4.0	4.0
	3 people	21	7.6	11.6
	4 people	46	16.7	28.3
	5 people	79	28.6	56.9
	More than 5 people	119	43.1	100.0
Household income	Less than RM2500	59	21.4	21.4
	RM2500–RM4999	54	19.6	40.9
	RM5000–RM7499	66	23.9	64.9
	RM7500–RM9999	33	12.0	76.8
	More than RM9999	64	23.2	100.0
Education level	Primary	14	5.1	5.1
	High school	167	60.5	65.6
	University/college	95	34.4	100.00

3.2. Parental involvement in monitoring foundation students' online learning

3.2.1. Parents' involvement in foundation students' online learning at home

Table 2 shows the parent's involvement in foundation students' online learning at home. Based on Table 2, it showed that majority of the parents selected the response, "child didn't require my assistance even though I offer it." (N=116, 42.0%). This was followed by "only help to ensure the task deadline achieved" (N=108, 39.1%), "assisting with task completion" (N=37, 13.4%), and "I did not help" (N=15, 5.4%).

3.2.2. Parent's monitoring time on foundation students' online learning

Table 3 shows the parent's monitoring time on foundation students' online learning. Based on Table 3, it showed that majority of the parents selected "less than 30 minutes" (N=93, 33.7%). This was followed by "not monitoring" (N=78, 28.3%), "30 minutes" (N=48, 17.4%), "1 hour" (N=32, 11.6%), "more than 2 hours" (N=22, 8.0%) and "2 hours" (N=3, 1.1%).

Table 2. Parents' involvement in monitoring foundation students' online learning at home

Parents' involvement in monitoring	N	%	Cumulative (%)
Assisting with task completion	37	13.4	13.4
Only help to ensure the task deadline achieved.	108	39.1	52.5
Child didn't require my assistance even though I offer it.	116	42.0	94.6
I did not help.	15	5.4	100.0
Total	276	100.0	

Table 3. Parents' monitoring time during foundation students' online learning

Parents' monitoring time	N	%	Cumulative (%)
Less than 30 minutes.	93	33.7	33.7
30 minutes.	48	17.4	51.1
1 hour	32	11.6	62.7
2 hours	3	1.1	63.8
More than 2 hours.	22	8.0	71.7
Not monitoring	78	28.3	100.0
Total	276	100.0	

3.3. Parents' perspectives towards involvement in foundation students' online learning at home

Table 4 shows the parents' perspectives towards their involvement in foundation student's online learning. Based on Table 4, the majority of the parents have positive perspectives towards involvement in foundation students' online learning (N=212, 76.8%). This was followed by parents who have negative perspectives (N=64, 23.2%). The overall mean and standard deviation of the parents' perspectives towards involvement in foundation students' online learning at home are 1.77 and 0.423, respectively.

Table 5 shows the means and standard deviations of the parents' perspectives toward involvement based on their respective domains. Based on Table 5, it indicated that means of the six domains (safety, content delivery, evaluation, social relationship, internet addiction and health) are between 5.866 to 12.837. While the standard deviation for all six domains is between 1.135 to 3.426.

Table 4. Parents' perspectives towards involvement in monitoring foundation students' online learning

Parents' perspectives	N	%	Mean	SD
Negative	64	23.27	1.77	0.423
Positive	212	76.8		
Total	276	100.0		

Table 5. Means and standard deviations of the parents' perspectives towards involvement based on domains

Perspectives domains	Mean	SD
Safety	11.438	2.235
Content delivery	6.826	1.805
Evaluation	12.837	3.426
Social relationship	5.866	2.099
Internet addiction	7.366	1.135
Health	10.011	2.382

3.4. Parents' challenges towards involvement in monitoring foundation students' online learning at home

Table 6 shows the parents' challenges towards involvement in monitoring foundation students' online learning at home. Based on Table 6, the majority of the parents have between "moderate to severe" (N=89, 32.2%) to "mild to moderate" (N=88, 31.9%) of challenges when involved in monitoring the foundation students' online learning. This was followed by "no or minimal" (N=52, 18.8%) and "very severe" (N=47, 17.0%). The overall mean and standard deviation for parents' challenges towards involvement in monitoring foundation students' online learning at home are 2.47 and 0.985, respectively. Table 7 shows the means and standard deviations of parents' challenges towards involvement based on their respective domains. Based on Table 7, it indicated that the means of the three challenges domains are between 6.536 to 9.779, while the standard deviation of all three domains is between 2.759 to 4.450.

Table 6. Parents' challenges towards involvement in monitoring foundation students' online learning at home

Parents' challenges	N	%	Mean	SD
No or minimal	52	18.8	2.47	0.985
Mild to moderate	88	31.9		
Moderate to severe	89	32.2		
Very severe	47	17.0		
Total	276	100		

Table 7. Means and standard deviations of the parents' challenges towards involvement based on domains

Challenges domains	Mean	SD
Personal	9.779	4.450
Technological	7.442	3.764
Economic	6.536	2.759

3.5. Parents' satisfaction in foundation students' online learning at home

Table 8 shows the parents' satisfaction in foundation students' online learning at home. Based on Table 8, it indicated that majority of the parents' satisfaction towards the foundation students' online learning at home is between high (N=134, 48.6%) and extreme (N=120, 46.5%). This is followed by parents' who have moderate satisfaction towards foundation students' online learning at home. Overall, the mean and standard deviation are 3.36 and 0.625, respectively.

Table 8. Parents' satisfaction towards involvement in monitoring foundation students' online learning at home

Parents' satisfaction	N	%	Mean	SD
Moderate	22	8.0	3.36	0.625
High	134	48.6		
Extreme	120	46.5		
Total	276	100		

3.6. Spearman's correlation between parents' perspectives towards involvement in monitoring foundation students' online learning at home and parents' demographics information

Table 9 shows Spearman's correlation between parents' perspectives towards involvement in monitoring foundation students' online learning at home and parents' demographic information (number of households, household income and education level). Based on Table 9, it showed that there is a strong, positive correlation between parents' perceptions towards involvement in monitoring foundation students' online learning at home and household income ($r_s=0.719$, $p\leq 0.01$). In addition, it also showed that there is a strong, positive correlation between parents' perceptions towards involvement in monitoring foundation students' online learning at home and parents' education level ($r_s=0.336$, $p\leq 0.01$). However, there is no correlation between parents' perceptions towards involvement in monitoring foundation students' online learning at home and number of households ($r=-0.062$, $p=0.301$).

Table 9. Spearman's correlation between parents' perspectives and parents' demographic information

Analysis	Variable	Measurements	Number of households	Household income	Education level
Spearman's rho	Parents' perceptions	Correlation coefficient	-0.062	0.719**	0.336**
		Sig. (2-tailed)	0.301	0.000	0.000
		N	276	276	276

** . Correlation is significant at the 0.01 level (2-tailed)

3.7. Discussion

The findings of the present study indicated that majority of parents had minimal involvement in monitoring, with most of them only providing reminders to their children about deadlines or not offering any assistance at all, as per their children's preference. Likewise, majority of the parents devoted little to no time monitoring the foundation students' online learning at home. This demonstrates that foundation students exhibit a higher level of self-reliance in their academic pursuits and actively reduce their parents' involvement, particularly in terms of monitoring their studies. This supported Batool and Raiz [30] study in parents' involvement in university level education, where it highlighted that although majority students recognized the necessity of parents' involvement in higher education, most of them believed that it is not vital, as they could address their issues alone. Miller *et al.* [31] suggested that parents should recognize their boundaries when engaging in their children's higher education, avoiding the role of a "helicopter parent," which can hinder the development of essential attributes necessary for independence. Parents should concentrate on adopting a supportive position by offering reassurances and enhancing their children's confidences in higher education, as well as creating an environment for them to express their concerns while also proposing potential solutions for addressing them [32]. The finding of the present study also indicated that most parents held a positive perspective, in all six domains (safety, content deliver, evaluation, social relationship, internet addiction and health), regarding their involvement in monitoring foundation students' online learning at home. This suggested that parents recognized the significance of their responsibility in overseeing their children's studies in foundation level. Rathaliya *et al.* [29] study also reported similar outcome, where they found that majority of the parents had positive perspectives towards students' online learning, with prioritizing the safety domain. Parents express satisfaction with the content and materials provided via the online learning platform and are positive that their children can safely adapt to the transition from traditional face-to-face classes to online learning [33]. Shal [33] further added that although parents perceived online learning as challenging and demanding for their children, they appreciate the good and efficient communication between school and educators, which facilitates their children adaptation and responsiveness in online classes.

In addition, the finding of the present study also showed parents perceived the challenges in monitoring the online learning of foundation students at home as ranging from moderate to severe. Based on the three domains (personal, technology, and economic), it suggested that not all parents believe they can effectively navigate the challenges and obstacles related to students' online learning, especially in higher education. Similarly, Samane-Cutipa *et al.* [34] emphasized that parents, particularly in rural areas, face numerous problems in their children's online learning, notably budgetary constraints and difficulties in accessing technology. Baharudin *et al.* [35] study also highlighted parents encounter many challenges during children's online learning, namely the difficulty of maintaining their children's focus during online sessions and the necessity for parents to supervise their children's engagement in online education, particularly while working from home. Besides challenges, the findings of the present study also demonstrated that parents' satisfactions towards the foundation students' online learning ranged from high to extreme levels. This indicated that parents were content with the online learning of current foundation students, particularly in material delivery and support for accomplishing educational objectives. The findings are also consistent with

Kumari and Jayathilaka [36], indicating that parents exhibited a high level of satisfaction regarding students' online learning during the COVID-19 pandemic. Lau *et al.* [37] study on online learning and parents' satisfaction during COVID-19 emphasized that higher parental satisfaction stemmed from both the duration of online learning and the volume of assigned tasks and proposed that the design of online learning should prioritize students' capacity for independent learning.

Lastly, the findings of the present study also indicated that there is strong positive correlation between parents' perspectives towards involvement in monitoring foundation students' online learning at home and household incomes as well as parents' educational level. This suggested that parents with higher household income and educational level are more likely to have a positive perspective on involvement in the monitoring of their children's online learning at the foundational level. The findings support study by Ishak *et al.* [38], which indicated that household income positively influences parental involvement at home. However, their study contradicted with the present research, revealing that the educational level of parents, particularly mothers, negatively impacts parental involvement time at home. Anwar *et al.* [39] also found that there are no significance difference parents' perspective towards students' online learning and parents' education level, as they emphasized that parents' educational backgrounds are not essential for students' adaptation to the online learning environment and asserted that students are more capable in handling and adapting to the online learning classes by themselves.

4. CONCLUSION

This study examined the parental involvement in monitoring foundation students' online learning at home towards their perspectives, challenges, and satisfaction. The findings on the study managed to highlight the importance of parental involvement in monitoring student online learning at foundation level and demonstrates that parents continue to exert significant impact on their children's education, even during their higher education years. The study aims to enhance educators' awareness of the significance and challenges of parental involvement in monitoring students' online learning while also promoting sustained parental involvement in their children's academic achievements. Educators should consistently communicate with parents to assess the status of students' online learning at home and enhance the interaction between parents and the educational institution. In addition, it is hoped that educational institutions and policymakers persist in exploring strategies to promote parental involvement in monitoring their children's online learning. Suggestions include regular sharing and collaborative sessions between parents and educational institutions regarding parental engagement, as well as integrating parental involvement into online learning activities. The study has limitations, as it exclusively concentrated on a single foundation center in Malaysia and did not account for students who previously attended boarding schools during their secondary education. Future recommendations for this study involve broadening the sample collection from parents of children attending various foundation centers in Malaysia, encompassing both governmental and private institutions as well as examine the impact students' attending boarding school prior to enrolment in foundation studies.

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AUTHOR CONTRIBUTIONS STATEMENT

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C : **C**onceptualization

M : **M**ethodology

So : **S**oftware

Va : **V**alidation

Fo : **F**ormal analysis

I : **I**nvestigation

R : **R**esources

D : **D**ata Curation

O : **O**riginal Draft

E : **E**diting

Vi : **V**isualization

Su : **S**upervision

P : **P**roject administration

Fu : **F**unding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

ETHICAL APPROVAL

An official letter was made to the foundation center to obtain authorization for conducting the study prior to its commencement. Participating parents were initially approached for their approval to participate and were required to complete a consent form in order to participate in the study. All data from the samples in this study will be remained confidential.

DATA AVAILABILITY

The data that supports the findings of this study are available on request from the corresponding author [GTGS]. The data, which contains information that could compromise the privacy of research participants, is not publicly available due to certain restrictions.




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