Advances In Multidisciplinary & Scientific Research
A Multidisciplinary & Interdisciplinary Journal
Volume 10, No 2, 2024 Series

Creating Productive Parent and Community Involvements in Science, Technology, Engineering and Mathematics Education (STEM) Among Students

Alake, Ese Monica
Department of Science Education
Bamidele Olumilua University of Education, Science and Technology
Ikere-Ekiti, Ekiti State, Nigeria
E-mail: alake.ese@bouesti.edu.ng
Orcid ID: 000-0001-6411-2122

ABSTRACT

Parental involvement in academic interests and competencies in science and mathematics in children often begin at home where parents and the community play vital roles. Empirical studies and meta-analysis further revealed that such involvement increase students' motivation, self-efficacy and academic performance. However, these vital ingredients have not been fully explored in students' science learning in many societies, particularly in the developing world because of numerous social economic factors. This present study investigated these parental factors on science, technology, engineering and mathematics learning through a survey of both the secondary school (high school) students in two Nigerian rural and urban communities. Validated structured questionnaire and interview were used for data collection. The data were analyzed to answer three research questions. The findings revealed that the parents whose children were covered in the study showed good parenting and parental care but do not participate in explaining science, technology, engineering and mathematics concepts to the children at home. Even when some engaged the children in science related communication at home, monitored their work and visited the schools as follow-up, the real life experience of basic concepts are not involving vis a vis the community at large. Factors which hindered a strong parent-school relationship include lack of proficiency in science on part of the parents, time and efforts. The study recommended that Government at all levels should create an organized forum for all stakeholders (parents/school/community) to ensure effective and organized involvement in science, technology, engineering and mathematics education learning.

Keywords: Creating, Productive, Parent, Community, Involvements and STEM

Aims Research Journal Reference Format:
Alake, E. M. (2024): Creating Productive Parent and Community Involvements in Science, Technology, Engineering and Mathematics Education (STEM) Among Students. Advances in Multidisciplinary and Scientific Research Journal Vol. 10. No. 2. Pp 31-.42
www.isteams.net/aimsjournal. dx.doi.org/10.22624/AIMS/V10N2P4

1. INTRODUCTION

Development of any nation lies on its scientific literacy and technological skills which starts from the home. The involvement of parents is therefore highly essential for the academic success and self-efficacy by students as opined by Varma (2019). This parental involvement is on the increase at the

pre-school and primary school level, where children are more easily trained (Desai, 2021 in Gülhan 2023). It is widely believed that students whose parents and care givers get involved in helping and monitoring school progress tend to perform well in their academic works (Thomas, Utley, Hong, Korkmaz & Nugent 2020; Talluri & Suneela, 2017; Jaiswal, 2017). Three decades of research show that the parents' and caregivers' involvements have led significantly in a variety of ways to improve students' learning outcomes (Christenson & Christenson, 1998; Brough & Irvin (2001), NSTA (2009), Oloruntegbe & Ikpe (2010), Varma (2019).

This align with the findings of Yang, Chen, Wang, Li, Zhang & Huang (2023) that parental involvement in children learning improves students' school adjustment and motivations resulting in better performance. The same goes for community involvement in school learning, especially in African settings where every adult shows keen interest in the upbringing and education of the child. As the African folk saying goes, "It takes a village to raise a child". This type holds sway in a less formal and less organized settings where the adults in the villages performed the roles of teachers, monitors, counselors and guidance, while in a more organized ones, local artisans and professionals like wood and metal fabricators, computer trainers and web providers were resources persons lending support to school teaching and learning particularly in vocational and skill development. This approach may look strange to the more developed nations where individualized and personalized training is encouraged and the communal type of living is non-existent. The children get assistance only from the family and the schools. In spite of this, Varma (2019), observes the minority and immigrant parents show lower level of involvements than the whites because there are barriers to participation by these low socioeconomic status (SES) groups are likely to experience.

It is evident that parents were found to be overwhelmingly interested in their children's science learning (NSTA, 2009). However, the performances in sciences did not meet the expectations of most parents; (U.S. Department of Education, 2004). As such, attempts to enhance parents' involvement in education occupy governments, administrators, educators and parents' organization across developed and developing nations (Desforges & Abouchaar, 2003). It is also evident that there is correlation between parental involvement and academic performance, especially in STEM (Jaiswal & Choudhuri, 2017; Diaz, 2023; Sumanasekera, Hamid, Khatibi & Azam, 2021; Manalo, Yumang & Almazan, 2023).

Although there are several factors that enhance or hinder school performance. It is expected that the home is in a good position to nurture the native and innate curiosity of the children. The children curiosity would stimulate them to explore their natural environment for enhanced interests and abilities in science, technology, engineering and mathematics. Much as parents are eager to help the children consolidate school learning at home, many parents were not proficient enough in science by themselves (Oloruntegbe & Ikpe, 2010a, 2010b), style of parenting matters to promotion of STEM (Rao & Wang, 2023; Thomas, Utley, Hong, Korkmaz & Nugent 2020). The key attributes of supportive out-of-school programmes such as appropriate structure, opportunity for skill building, supportive relationship, positive social norms and technology-rich social learning environment are necessary but may not be available in many homes especially the detracted learners.

The worsening economic situations may have forced many parents to spend greater part of the day at work and other engagements, leaving little or no time for the needed assistance to the children.

Additionally, challenges relating to transportation and scheduling frustrations, inability to communicate in English and in language of science were identified (Varma, 2019).

How can parents and the community be effective in nurturing the native, creative and curiosity tendencies of the children and help children to establish relationship between school science and home activities? What do the parenting, parental care, communication at home, home work supervision, monitoring, visit to school look like? Are parents supportive of the children school science learning? Does lack of proficiency in science of parents constitute a hindrance in helping the children? What are the other hindrances? Is the present day community forthcoming in helping the children? What exact contributions are coming from the communities to the schools? Providing answers to these questions is the main focus of this paper.

1.1 Social media and Parents involvement in Promotion of STEM

The challenge is evidence from the behaviour in the 21st century characterized with advancement of social media. The family setup has undergone significant changes overtime (Ansong, et al 2017). So also is the community. No thanks to increased civilization, automation of home activities including chores through which students can help the parents and consolidate school science learning. The youths always want to enjoy unlimited freedom away from the prying eyes of the adult. Present day students are engaged more in social activities, social media at the detriment of studying hard (Olaleke, Iroju & Olajide, 2015; Iro-Idoro & Jimoh, 2017). Some stay glued hours to television screen, YouTube and other social platforms viewing programmes that only amuse (Oloruntegbe et al 2010a) or sometimes debase but bear little or no relevance to their course of study Ansong et al. (2017).

Oloruntegbe et al (2010a) had long noted with nostalgia the lack of interest of youths in studying science that led to the inventions of this state art-technology, but rather viewed the conscientious and diligent scientists of the past as a stuff of history. Attention has now been shifted to the better remunerated careers in social sciences, film artist and sports. No wonder Djallo, 2004, and others raised the alarm, “that science education is in danger” p 11, and the entire place is a “world at risk”. With the economic meltdown occasioned by COVID-19 pandemic and rising unemployment everywhere particularly in the developing world, the youths have found further but negative engagements in vices like cult activities, terrorism, kidnapping and robbery to the extent that the society is groaning under the heavy burden of insecurity and unrest. There is hardly any society that is shielded from these scourges.

The perception of social media as antithetical and inimical to STEM education and learning as painted above may not be entirely correct. They have their positive impacts (Laleye, 2019). Events have changed over times as far as parents’ involvement in children education is concerned. Parents’ roles in technology-enhanced social learning environment have attracted researches. Varma (2019), Ansong, (2017) again identified four main roles in a study designed to investigate the roles of parents in technology-enhanced social learning environment. These roles vary based on the structure and the content of the prompts of the various participation dynamics that students and parents completed together.
Parental roles could as well vary based on the personality and experience of the parents with the project activities. It was a video recording of household chores in which questions were asked, for

example, what is one example of a chemical change you have observed at home, and what evidence do you have that it was a chemical change and not just a physical change of matter. A father and daughter went on completing the prompts.

The four roles that parents take on as they generate video responses with the children started with being passive participant through scientific knowledge resource, cultural knowledge resource to being co-learner. The parents began as passive participants and improved to be a co-learner with the children. Experience has shown that parents and children are co-learners with parents learning more from the children how to get the maximum benefits from the embedded apps on mobile phones and other gadgets. On the other hand the parents will always point the children attention to the apps and views that enhance achievements in science.

Apart from learning via social media, the above study reinforced the fact that important science concepts can be learnt through non-automated household chores if the children are exposed to such experiences. Learners go a long way to consolidate and connect science to real life as opined by Oloruntegbe, Ikpe & Kukuru (2010b), Alake & Omodara (2024). Siggraph (2004) affirms that simple scientific experiments can be conducted in the comfortable confines of the kitchen and the final results may be edible. What approach to science learning? However, learning in the kitchen may not be considered fashionable like the pleasant and formal one in the school laboratories and the pervading book approaches. According to Oloruntegbe & Ikpe (2010a) and Alake (2024), difficult concepts such as radiation, convection, conduction, energy and chemistry of carbohydrates, proteins and vitamins may seem overwhelming to many students, yet to explore and appreciate these scientific concepts during preparation of food may actually be a fun and exciting adventure.

Obviously, the energy and the potentials of the youths in regions prone to societal vices can be channeled towards productive activities. What steps are being taking by the communities in this regard particularly in empowering the youths will go a long way to help reduce such vises. The growing unemployment in many nations of the world has provoked the emergence of several empowerment programmes, particularly in the developing nations. There is the Youth Empowerment Partnership Programme (YEPP) that cut across six European countries. The programme is a multi-layered international project working in disadvantaged areas called Centres of High Intensity (CHIs). YEPP promotes community and youth empowerment through capacity building and training at the local level which involves all local stakeholders in a process of systematic planning for long-term change.

There was the African Youth Decade 2009-2018 Plan of Action for accelerating youth empowerment for sustainable development (African Union. 2011). There are countless number of such programmes in the continent and more are springing up daily in Nigeria in recent times. Yet poverty and unemployment still loom large. Available data puts Nigerian situation at 12% and 24% of the working age population in 2006 and 2011 respectively (World Bank, 2013). The implementation of the empowerment programmes was also fraught with various problems. Poor monitoring and supervision, inadequate funding and infrastructural facilities, lack of qualified youth personnel (leaders), poor management of youth recreational facilities and vocational centers among others were identified (Ifenkwe, 2012). Empowering the youths is the key to achieving sustainable development.
While there is high graduation rates in STEM disciplines, it is observable that many of them are unemployable at graduation due to poor education and lack of skills for the job (Olojuolawe &

Adeoluwa 2022). Many employers are skeptical appointing this set of people to positions without additional training and with additional costs. Entrepreneurship was introduced into school curriculum to partly bridge this gap providing sellable skills and to provide alternatives for those that could not get the job or those that want to stay on their own. Entrepreneurial education was seen as capable of developing in students' analytical power, communication and problem-solving skills (Anyakaoha, 2009; Duyilemi, 2014, Olojuolawe et al (2022)). Development of team spirit, creativity and lifelong skills are other purposes of introducing this type of education in universities in Nigeria for example. Laudable as this gesture is to curriculum developers, it was also discovered that inadequate funding is a major problem as big term businessmen are not prepared to lend support, only very few people showed concerns as the case is in Adekunle Ajasin University, Akungba-Akoko, Nigeria (Duyilemi, 2014).

In all these, much is still being expected of the parents and the communities to get involved in the general education of the students, in youth empowerment programmes as well as entrepreneurial education. The aim of this paper is to examine how the activities of the parents and the communities in terms of parenting, parental care, communication at home, monitoring, visit to school and other variables contributed to students' science, technology, engineering and mathematics learning and youth empowerment in a sub-urban societies in Nigeria.

Research Questions

The following research questions were formulated to guide the study.

1. Do parents get involved in the education of their children in STEM?
2. Do parents discuss and monitor issues relating to academic success in STEM with the children at home?
3. Are the communities involved in youth empowerment programmes and in the progress of youth in their domains?

2. METHOD

A survey research design was employed with the use of researcher constructed validated questionnaire. Six intact class consisting of 230 male and female Senior Secondary (High) School science students randomly selected from Government co-educational secondary schools in sub-urban location in Southwest, Nigeria was used to generate the nominal data. The data were analyzed using frequency counts and percentages.

3. RESULT

Research Question 1. Do parents get involved in the education of their children?

Table 1. Parenting

Variables	Male		Female	
	Yes	No	Yes	No
Do you stay with your parents?	95	14	111	10
Do you stay with father alone?	5	100	9	116
Do you stay with mother alone?	11	94	22	103
Are you staying with guardian?	22	82	12	106
Are you staying on your own?	6	97	4	118
Are you staying with friends?	2	103	2	117

Majority of the students stayed with the two parents as shown in the table 1. That is 206 students stay with both parents while very few stay with father, mother, guardian, friends or live alone.

Table 2. Parental Care

Variables	Male		Female	
	Yes	No	Yes	No
	Agree	**Disagree**	**Agree**	**Disagree**
My parents provide three meals daily	65	4	90	1
I eat only once a day	4	61	3	89
They take me to hospital whenever I am sick	57	11	80	15
My parents don't care for me	5	61	9	83
My parents buy all my books	61	8	89	5
They encourage me to study often	68	2	86	5
They scold me if I don't study at home	58	10	76	22
They check my take home assignment	61	8	82	9
They want me to be well placed in future	67	3	90	2
My parents do not care what I become in future	2	63	5	86

Most parents showed proper parental care as seen on table 2.Majority of the parents show concern and check the children assignments at home.

Research Question 2: Do parents discuss and monitor issues relating to academic success in STEM with the children at home?

Table 3. Communication that enhance or hinder science learning at home

Variables	Male				Female			
	Never	Rarely	Sometimes	Often	Never	Rarely	Sometimes	Often
How often do your parents discuss your academic progress with you?	4	1	29	65	4	18	23	87
Since the beginning of the school term, how often have your parents discussed with you about your school work?	3	15	29	53	5	17	34	79
How often do your parents check if you have done your homework?	7	17	39	39	8	20	42	58
How often do you discuss your academic work with your parents?	0	15	33	48	7	14	41	67

The table 3 shoe that more than 70% of parents engage the children in communication that enhances learning at home. While 23% of the parents do not communicate with the children on school assignments.

Table 4. Monitoring of Children School works by parents

Variables	Male				Female			
	Never	Rarely	Sometimes	Often	Never	Rarely	Sometimes	Often
My parents limit the amount of times I spent watching TV everyday	23	11	25	40	13	22	30	59
They limit the number of times I go out with friends	17	15	26	43	10	23	29	64
They don't care how long I stay out with my friends	46	20	16	17	49	18	17	40
They don't care how long I stay watching TV	48	12	19	14	53	15	29	29
My mother is always home when I return from school	17	12	49	16	11	24	52	35
My parents often stay long at work and come back home late	35	14	39	11	48	15	45	15

The results on table 4 indicated that majority of parents did monitor what the children do at home. While a few rarely care about what the children do after school.

Table 5. Parents' proficiency in science as a way of helping children learn science

Variables	Male				Female			
	Agree	%	Disagree	%	Agree	%	Disagree	%
My mother couldn't help me in science because she is not versed in it	43	19%	66	29%	49	21%	72	31%
My father too doesn't know anything about science	19	8%	90	39%	21	9%	100	44%
They do not have interest in my science career	13	5%	96	42%	7	3%	114	50%
My father coaches me in science at home	74	32%	35	15%	87	38%	34	15%

The results on table 5 show that majority of the parents were proficient enough in science to help children learn science that is, 60% of the parents could assist the children in learning science.

Table 6. Whether parents often visit the schools to monitor children

Variables	Male				Female			
	Never	Rarely	Sometimes	Often	Never	Rarely	Sometimes	Often
My parents come to school to check how I fare	19	13	38	23	16	21	39	47
They attend the PTA meetings regularly	6	17	32	42	10	19	26	67
My father has always been playing important roles in the PTA	8	22	35	34	18	14	34	57
My father coaches me in science at home	18	14	29	31	19	16	39	48
My mother is often friendly with my teachers	12	22	22	39	23	20	26	54
My father doesn't like science subject at all, he doesn't share my science career	44	16	22	19	73	12	16	23
They are often interested when I participate in sports, they come to watch me	13	17	38	29	21	17	34	52

The results on table 6 indicate that some parents did visit and get involved in the school activities to that help the children while a few did not care.

Research Question 3: Are the communities involved in youth empowerment programmes and in the progress of youth in their domains?

Table 7. Community Involvement in children school learning

Variables	Male				Female			
	Agree	%	Disagree	%	Agree	%	Disagree	%
There are important places of educational interest in the community	100	43%	9	4%	108	47%	13	6 %
The community where I live encourage education	92	40%	17	7%	103	45%	18	8%
The people of the community make donations when we hold science week	55	24%	54	23%	66	29%	55	24%
Some member of the community do come to teach us in school	58	25%	51	22%	54	24%	67	29%
Our school is getting worse every day	23	10%	86	37%	38	17%	83	36%
The community comes to help the school from time to time and empower the youth.	69	30%	40	17%	81	36%	40	17%

From the responses of the children most of them agreed to good community involvement in their education. A few responses indicated no concerted community participation.

4. DISCUSSION OF FINDINGS

Students responses of the type of parenting, parental care, the degree of educational related communications at home, monitoring, visiting as well as community involvement were shown respectively on tables 1 to 7. The findings showed that students enjoy parental care and monitoring which can enhance learning as supported by Manalo et al (2023) and Yang et al (2023). But more than 50% of the parents do not relate science concepts to real life experience at home. This may make the teaching of STEM subjects abstract and difficult to learn Alake (2024a). Even when some engaged the children in science related communication, monitored children work and visited the schools as follow-up but teaching of science, technology, engineering and mathematics concepts were not applied to real life experience by the parents. The fact that some parents did not care about these showed there may be negative peer influence on the children. Community on the other hand has contributed to the learning of science but did not commit enough finance to help the schools and students in sciences. The findings have remained fairly consistent despite the fact that families have undergone significant changes during that time, and schools too "operate in very different times than those of a decade or two ago" (Drake, 2000, p. 34).

5. CONCLUSIONS

Whereas one of the eight goals included in the 21st century (1994, 2000) legislation was dedicated to the critical area: that "every school will promote partnerships that will increase parental involvement

and participation to enhance the social, emotional, and academic growth of children" (U. S. Department of Education, 1994). It could be seen that many schools and many parents have not keyed into this. The importance of parent/family involvement was reaffirmed in 1997 when the National PTA, in cooperation with education and parent involvement professionals, developed six National Standards for Parent/Family Involvement Programs (White, 1998). The involvement is yet to reach a "new level of acceptance. It is therefore recommended that Institutions should organize seminars for parents in order to enhance students learning outcome and concerted efforts be made by all stakeholders (Government, parents, schools, community, philanthropist) to ensure effective and coordinated family/school involvement in children' science learning.

Acknowledgement
The researcher acknowledged the support received from Prof. K.O. Oloruntegbe, and all participants.

Ethical Consideration
Ethical consideration is of great importance when a research involve human beings. As a result, the consent of all participants was sought and were duly informed of the purpose of the study as opined by Dooly. et al., (2017). An assurance of the confidentiality of the information provided by the participants was given by the author. There is no ethical clearance number.

Conflict of Interest
The author declare no conflict of interest

Competing Interests
None

Funding
The author did not receive any funding to support this research.

REFERENCES

African Union (2011). The African Youth Decade 2009-2018 Plan of Action for accelerating youth empowerment for sustainable development. Ethiopia; Addis Ababa; www. Africa-union.org

Alake, E.M. (2024a). In-Service Teachers' Perceived Reasons for Chemistry Content Difficulty in School Curriculum. *Journal of Liaoning Technical University (Natural Science Edition)* 18(2) 41-54. https://www.lgidxcn.asia/

Alake, E.M. & Omodara, O. D. (2024b). Attitude and Behavioural Intention of Science Students Towards Blended Learning in Tertiary Institutions in Ekiti State. *Journal of Liaoning Technical University (Natural Science Edition).* 18(2), 160-177. https://www.lgidxcn.asia/

Ansong, D.; Bowen. G. L.; Walker, A. M & Eisensmith, S.R. (2017). The role of parent, classmate And teacher support in student engagement: Evidence in Ghana. *International Journal of Education and Development.* 54, 51-58.

Anyakoha, E.U. (2009) New Entrepreneurship Education and Wealth Creation Strategies: Practical Tips for Economic Empowerment and Survival. Great AP Express Publishers Limited, Nsukka.

Brough, J. A., & Irvin, J. L. (2001). Parental involvement supports academic improvement among middle scholars. *Middle School Journal, 32*(5), 56-61.

Christenson, S. L., & Christenson, J. C. (1998). Family, school, and community influences on Childrens' learning: A literature review. (Report No. 1). Live and Learn Project. Minneapolis: University of Minnesota Extension Service.

Desai, P. (2021). Increasing parent involvement at Carver STEM Academy, University of Michigan Engineering Honors Program Capstone–Final Report. Available at: https://deepblue.lib.umich.edu/bitstream/handle/2027.42/ 169571/Final Report Priya_Desai.pdf?sequence=1&isAllowed=y.

Desforges C & Abouchaar, A. (2003). The impact of parental involvement, Parental support and family education on Pupil achievement and adjustment: A literature review Queen's Printer 2003 ISBN 1 84185 999 0 June 2003

Diaz, L.B. (2023) Current Approaches for Engaging Parents in Students' Academic Performance: Basis for Parental Engagement Policy. *American Journal of Multidisciplinary Research and Innovation, 2*(4), 32-41. https://journal.ep alli.com/ajmri/1817

Djallo, A. B. (2004). Science Education in Danger. Education for Today. The Newsletter of UNESCO's Education Sector, 11

Dooly, M., Moore, E. &Vallejo, C. (2017) Research Ethics. In M. Dooly, E. Moore, & C. Vallejo (Eds.), *Qualitative approaches to research on plurilingual education* (pp. 351–362).

Duyilemi, A.N. (2014). Engendering Science and Mathematics Education in Nigeria through Constructivist Intervention Strategies. *Journal Education Practice, 5*, 12, 82-89

Gülhan, F. (2023). Parental Involvement in STEM Education: A Systematic Literature Review. *European Journal of STEM Education, 8*(1), 05. https://doi.org/10.20897/ejsteme/13506

Hussien, A.Y, Muturi, W and Samantar, M.S. (2018). The influence of community involvement on academic performance of secondary schools: Case of Garowe District. *International Journal of Contemporary and Applied Researches,* 86- 108

Ifenkwe, G.F. (2012). Mobilizing and empowering youths for sustainable community and rural development in Nigeria. *International Journal of Academic Research in Progressive Education and Development, 1,* 2 144-152

Iro-Idoro, C. B. and Jimoh, T. A., (2017). Social Media Use among Students of Federal Polytechnic Ilaro, Ogun State, Nigeria: Implication on Academic Performance, IOSR *Journal of Humanities and Social Science (IOSR JHSS) 22*, (4), Ver. 8. 59-66

Jaiswal, S. K. (2017). Role of Parental involvement and some strategies that promote parental involvement. *Journal of International Academic Research for Multidisciplinary, 5*(2), 95-104.

Jaiswal, S. K. and Choudhuri, R. (2017). A Review of the Relationship between parental involvement and students' academic performance. *The International Journal of Indian Psychology, 4*(3), 110-123

Kline, F.M. (1997). The influence of Community on Students' Academic Performance. *Child and Adolescent Psychiatric Clinics of North America, 6*(3), 607-620

Laleye, A. M. (2019). Effects of a Computer-Programmed Instructional Strategy on Basic Science Students' Learning Outcome in Two Instructional Settings in Ondo State, Nigeria. *International Journal of Scientific Research and Management (IJSCRM) 7*(2), 869-876

Manalo, E. T.; Yumang, E. L & Almazan, C.M. (2023). Parental Involvement and Students Engagement in Modular Learning Environments. *International Journal of Multidisciplinary Research and Analysis 6*(5), 2285-2303. DOI:10.47191/ijmra/v6-i5-57

NSTA Board of Directors (2009). Parent involvement in science learning https://www.nsta.org /nsta-official-position/parent-involvement-science-learning April 2009

Olaleke, J.O., Iroju, O.G & Olajide, M.S., (2015). An Assessment of the Use of Online Social Network Sites for Enhancing Computing Students' Academic Activities, *Journal of Scientific Research & Reports 5*(6): 489-499,

Oloruntegbe, K.O. & Ikpe, A. (2010a). Ecocultural factors in students' ability to relate science concepts learned at school and experienced at home: Implication for chemistry education. *Journal of Chemical Education 83*(3), 266-271.

Oloruntegbe, K.O, Ikpe, A & Kukuru, J.D. (2010b). Factors in students' ability to connect school science with community and real world life. *Education Research and Review 5*(7), 372-379.

Rao, M., & Wang, H. (2023). The Relationship between Parenting Styles and Adolescents' Academic Achievement. *Journal of Education, Humanities and Social Sciences*, *22*, 753- 757.

Sumanasekera, I., Hamid, J. A., Khatibi, A., & Azam, S. F. (2021). Review of Literature on Involvement and Style of Parents: Towards Student Performance. *International Journal of Advanced Scientific and Technical Research*, *1*, 26-38.

Thomas, J., Utley, J., Hong, S. Y., Korkmaz, H., & Nugent, G. (2020). Parent involvement and its influence on children's STEM learning: A review of the research. Handbook of research on STEM education, 323-333.

Varma, K. (2019). Technology-enhanced parent involvement in science education, in F. Altinay ed), The Role of Technology in Education (pp. 1-12). https://doi.or g/10.5772/in techopen.86266

US Department of Education (1994). Strong Families, Strong Schools. Building Community Partnerships for Learning: A Research Base for Family Involvement in Learning from the U.S. Department of Education, NCJRS.

Yang, D.; Chen, P.; Wang, K.; Li. Z.; Zhang, C & Huang, R. (2023). Parental Involvement and Student Engagement: A Review of the Literature. Sustainability 2023, 15, 5859. https://doi.org/10.3390/su15075859.