TECHNIUM
SOCIAL SCIENCES JOURNAL

Technium.

44/2023

2023
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Technium Social Sciences

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Technium Social Sciences Journal
Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
www.techniumscience.com

Schools' Readiness, Teachers' Proficiency, and Science Technology Engineering and Mathematics (STEM) Students' Preparedness for Higher Education

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Abstract. Students' preparedness is the extend to which students possess the skills, knowledge, and disposition necessary to succeed academically and socially in higher education practices. The purpose of this study was to determine schools' level of readiness along funding resources, teacher training and curriculum, and teachers' level of proficiency along pedagogies, qualification and training, classroom instruction and adequate resources, and STEM students' level of preparedness for higher education and test the significant difference between the different factors that influence students' preparedness for higher education. The researcher utilized descriptive-correlational method of research with the help of survey questionnaires as the main source of data. A value of 0.000 indicates a high level of the predictions of the dependent variable (STEM students' preparedness for higher education). Further, the ANOVA shows that that the independent variable curriculum under the school readiness being statistically significantly predicted the dependent variable STEM student's preparedness with an F-value of 6.331 and probability value of 0.000 which is less than the 0.05 significance level. This study is hoped to be a useful reference in sustaining schools' readiness in terms of curriculum design. Curriculum defined as a complex, dynamic, and contested entity that is not limited to a prescribed set of content or outcomes, but it shaped by various actors and forces, including policy, culture, history, and social context.

Keywords. Schools' Readiness, Teachers' Proficiency, STEM Students' Preparedness, Curriculum, Funding Resources, Teacher Training, Pedagogies, Classroom Instructions

I. Introduction

Basic education in the Philippines responded to the multiplicity of demands in its sociopolitical, economic, technological, and academic spheres through various reforms, the most large-scale of which is the K to 12 education programs. This initiative changed many facets of the curricular operations in Philippine classrooms which are supported by policies. The changes that these curricular policies intend to achieve are shaped by the teachers who are at the forefront of its implementation, powerless yet vital (Bongco and David, 2020).

Barrot (2021) examined the K-12 curriculum reform in the Philippines and suggests ways on how it can move forward. Specifically, three recent curriculum guides (i.e., science, mathematics, and English) were analyzed to determine how they fit with the Education 4.0 milieu. Using a curriculum analysis matrix, the findings indicate that these curricula may require conceptual and pedagogical refinements, particularly in the area of constructive alignment, technology integration, and specificity of its components. Potential implementation challenges in terms of instructional delivery, assessment, lesson preparation, school-based initiatives, and commitment of teachers and school leaders to curriculum reform were also discussed. Recommendations for future design, implementation, and studies are offered.

Chen & Borman, (2020), defined schools' readiness as "the extent to which schools possess the necessary resources, policies, practices, and leadership to effectively implement and support educational programs and services for students"

Students' academic and career paths can be affected or enhanced by schools and teachers. When high school students consider which academic or career path they would like to take, they rely on resources the school provides such as learning facilities college and career guidance. In addition, students get to know their academic and/or vocational interests better when schools provide educational activities such as college and career day, and learning exposition discovered that when students participate in STEM-related activities in informal learning environments, such as STEM summer camps, their STEM learning interests and career orientation are enhanced. These out-of-school STEM learning experiences could support and enhance students' STEM learning in classroom. They also underscore the need for more research and standardized measures to better understand and improve schools' readiness for STEM education. (Hector Rivera and Jui-Teng Li, 2020). The level of schools' readiness for STEM education along the curriculum can be influenced by a range of factors, including the design of the curriculum, the alignment with learning goals and objectives, the use of project-based learning experiences, and the integration of STEM subjects with other areas of study. Understanding these factors can help to identify strategies for improving schools' readiness for STEM education by enhancing the quality and effectiveness of the curriculum.

Furthermore, teachers' Proficiency is the "the ability to design, deliver, and evaluate instructional practices that are aligned with the needs of individual learners and the goals of the curriculum, (Abulafia et al., 2021). They study that teacher knowledge and skills in STEM content, pedagogy, and technology were critical for successful STEM education. Teachers who lacked knowledge in these areas struggled to effectively implement STEM activities and engage their students.

Likewise, students' Preparedness is the "the extent to which students possess the skills, knowledge, and dispositions necessary to succeed academically and socially in higher education" (McMillan & Cushman, 2021, p. 6). A recent study by Huang and Liu (2020) investigated the relationship between students' performance on the SAT (Subject Achievement Test) Subject Tests in mathematics and their success in STEM majors in college. The study found that students who scored high on the math SAT Subject Test were more likely to major in STEM fields in college. A recent study by Sullivan and colleagues (2021) examined the effectiveness of a pre-assessment tool for predicting students' success in a first-year engineering course. The study found that the pre-assessment tool was effective in identifying students who were at risk of struggling in the course. Similarly, the study by Sharma and colleagues (2021) investigated the relationship between students' STEM attitudes and their academic achievement in STEM fields. The study found that students' attitudes towards STEM subjects were positively related to their academic achievement in STEM courses. Even, interviews and focus Groups from a recent study by Cooper and colleagues (2020) used these to investigate students' perceptions of the factors that influenced their success in an introductory engineering course. In addition, technology contributes to improving student achievement and performance in the use of the English language in the classroom in particular; it will also increase their participation and interaction with their teachers (Yango, Bermudo and Quendangan, 2019).

However, despite the number of studies that investigated STEM education, no researchesyet have been studied for schools' readiness, teachers' proficiency and STEM students' preparedness for higher education at selected private schools in the City of Binan, Laguna.

1.1 Objective of the Study

The study aimed at determining the schools' readiness, teachers' proficiency, and STEM students' preparedness for Higher Education. Specifically, the study sought answers to the following sub-problems: (1.) to measure schools' level of readiness along: funding resources, teacher training and Curriculum, (2.) to measure teachers' level of proficiency along: Pedagogies – Skills and Knowledge, Qualifications and Training; Classroom Instruction; and Adequate Resources (3.) to measure STEM students' level of preparedness for higher education, (4.) to determine the significant relationship between the schools'level of readiness and teachers' level of proficiency, (5.) to determine the significant relationship between the schools' level of readiness and STEM students' level of preparedness for higher education, (6.) to determinesignificant relationship between the teachers' level of proficiency and STEM students' level of preparedness for higher education and (7.)to know predictive are the schools' level of readiness and teachers' level of proficiency, taken singly or in combination, of STEM students' level of preparedness for higher education?

II. Methods

The study employed descriptive-correlational method of research with the help of survey questionnaire as the main source of data. Statistical method was utilized to give credence and reliability to the work. This is one in which information is collected without changing the environment (i.e., nothing is manipulated). The empirical data were obtained from the respondents of the study which are the STEM teachers in selected private school of the City of Binan, Laguna and answered the questionnaires provided in the study of Schools' Readiness, Teachers' Proficiency and STEM Students' Preparedness for Higher Education.

The study aimed to determine the schools' readiness, teachers' proficiency, and STEM students' preparedness for higher education of selected private school at Biñan City, Laguna. The selected private schools were Saint Michaels College of Laguna, University of Perpetual Help System Laguna, Lake Shore Educational Institute, Sta. Catalina College Binan, and La Consolation College Binan. The number of STEM teachers were 21, 24, 6, 2, 8 respectively. The total population of the study was 61 STEM teachers of selected private school at Binan City, Laguna. The sample size was 53 STEM teachers at Biñan City, Laguna using the Raosoft calculator with 95% confidence level and 5 % margin of error. Stratified random sampling technique was used in the study. The study was conducted during School Academic Year 2022-2023.

The researcher used self-made questionnaire. The questionnaire was divided into three parts. First part was for schools' level of readiness, second was for teachers' level of proficiency and third was for STEM students' level of preparedness for higher education.

Questionnaires were based from the study of Wallace & Bencze (2021). Assessing School Readiness for STEM Education: Development and Application of an Australian School STEM Capability Framework. Journal of Science Education and Technology. The study aimed to develop and apply an Australian School STEM Capability Framework to assess schools' readiness for STEM education in Australia. Kavak, & Türkmen. (2020). Assessing Teachers' STEM Teaching Proficiency: A Study on Pre-Service Teachers in Turkey. International Journal of Science and Mathematics Education.

The researcher had secured a letter of request asking permission from the concerned Administrator of selected private school in Binan City, Laguna for the conduct of the study. Upon the approval of the request, the questionnaires were personally administered by the researcher to the respondents of the study following the safety protocols which were the use of face masks, as well as the enforcing social distancing to adhere to the health protocols set by the Inter-agency Task Force (IATF) related to the COVID - 19 pandemic. The researcher explained to the respondents about the nature of their participation in the investigation and discussed with them the instructions to follow for easy and convenient ways of answering the survey forms. The respondents assured that the information that were provided by the researcher would be treated with confidentiality as part of the ethical considerations of the study. Individual consent of the respondent was also obtained, explaining to them that this investigation was simply an academic requirement and would be kept with utmost privacy. The accomplished questionnaires were collected right after they answered by the respondents and the gathered data were tallied, tabulated, analyzed and interpreted. Statistical treatment was employed to interpret the data of the study using Weighted Mean and ranking, Pearson r was used to determine the significant relationship between the respondents' level and Stepwise Multiple Regression Analysis were used to test the validity of the assesses each independent variable's statistical significance sequentially in a linear regression Model.

III.Results and Discussion

Table 1
Schools' Level of Readiness: Funding Resources

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. The school receives funding for STEM-related programs and initiatives.	3.30	Very High (Strongly Agree)	6
2. The school has access to STEM-related equipment and materials.	3.66	Very High (Strongly Agree)	1.5
3. The school receives funding for professional development for teachers to improve their STEM teaching skills.	3.28	Very High (Strongly Agree)	7
4. The school receives external support, such as grants or partnerships for STEM education.	3.08	High (Agree)	12
5. The school receives funding for integrating STEM concepts into existing curriculum.	3.34	Very High (Strongly Agree)	5
6. The school receives funding for culture of innovation and creativity with the school community.	3.17	High (Agree)	11
7. The school receives funding in developing perceived competence in mastering the skills and practices in STEM.((Does this describe funding resources.	3.06	High (Agree)	13.5
8. The school receives funding for students in supporting school education in these subjects.	2.98	High (Agree)	15
9. The school receives funding in dedicating STEM curriculum or program.	3.25	Very High (Strongly Agree)	9
10. The school receives funding in putting too	3.19	High	10

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Technium Social Sciences Journal
Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
www.techniumscience.com

much emphasis in meeting the state standards of STEM subjects.		(Agree)	
11. The school receives funding for teachers' lot of supports at home or after the school to do well in STEM classes	3.06	High (Agree)	13.5
12. There are opportunities for students to engage in extracurricular STEM activities such as clubs, competitions, or events.	3.64	Very High (Strongly Agree)	3
13. There are qualified and trained teachers to Teach STEM subjects.	3.66	Very High (Strongly Agree)	1.5
14. The school has partnerships with local STEM- related organizations or businesses	3.26	Very High (Strongly Agree)	8
15.The school has a plan to continuously improve and evolve their STEM program over time.	3.57	Very High (Strongly Agree)	4
Average Weighted Mean	**3.30**	**Very High** (Strongly Agree)	

Table 1 presents thelevel of schools' readiness in terms offunding resources, as seen on the table, indicators 2 and 13 "The school has access to STEM-related equipment and materials" and "There are qualified and trained teachers to Teach STEM subjects", had obtained a weighted mean of 3.66 respectively, verbally interpreted as "very high" and were ranked 1.5, indicator 12, which states "There are opportunities for students to engage in extracurricular STEM activities such as clubs, competitions, or events", had obtained a weighted mean of 3.64, verbally interpreted as "very high" and was ranked 3, indicator 15 "The school has a plan to continuously", had obtained a weighted mean of 3.57, verbally interpreted as "very high" and was ranked 4, indicator 5 "The school receives funding for integrating STEM concepts into existing curriculum, had obtained a weighted mean of 3.34, verbally interpreted as "very high" and was ranked 5, indicator 1 "The school receives funding for STEM-related programs and initiatives", had obtained a weighted mean of 3.30, verbally interpreted as "very high" and was ranked 6.

On the other hand, indicator 8 "The school receives funding for students in supporting school education in these subjects, had obtained a weighted mean of 2.98, verbally interpreted as "high" and was ranked 15, indicators 7, 11, had the same weighted mean of 3.06, verbally interpreted as "high" and were ranked 13.5 respectively, indicator 4 "The school receives external support, such as grants or partnerships for STEM education.", had obtained a weighted mean of 3.08, verbally interpreted as "high", and was ranked 12, indicator 6 "The school receives funding for culture of innovation and creativity with the school community", had obtained a weighted mean of 3.17, verbally interpreted as "high", and was ranked 11, and indicator 14 "The school has partnerships with local STEM- related organizations or businesses", had obtained a weighted mean of 3.26, verbally interpreted as "very high", and was ranked 8.

To sum up, an average weighted mean of 3.30 revealed that the level of schools' readiness along funding resources was very high. The results imply that the school has qualified and trained teachers to teach STEM subjects and the school has access to STEM-related equipment and materials.

The results support the study made by Chen and Borman, (2020), it is the ability of a school to adapt to changing circumstances and meet the needs of its student and community.

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Technium Social Sciences Journal
Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
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Schools' readiness to sustain the state of being prepared, having the necessary skills and knowledge and being to adapt to changes in the environment or context.

Likewise, Darby et al., (2021), examined the impact of STEM education programs on students' academic achievement and attitudes towards STEM fields. The review found that such programs were effective in improving students' academic outcomes and attitudes towards STEM subjects, particularly when they included real-world applications and interdisciplinary approaches.

Table 2
Schools' Level of Readiness: Teachers' Training

Indicators	**Weighted Mean**	**Verbal Interpretation**	**Rank**
1.The school provides formal training in teaching STEM subjects.	3.45	Very High (Strongly Agree)	14
2.The school is confident in my ability in teaching STEM subjects.	3.55	Very High (Strongly Agree)	5
3.The school provides necessary resources to support STEM education.	3.60	Very High (Strongly Agree)	3
4. The school is able to integrate school curriculum To STEM concepts.	3.53	Very High (Strongly Agree)	6.5
5.The school provides STEM concepts taught in a way that is relevant to local context.	3.57	Very High (Strongly Agree)	4
6.The school acquires my peer assessment As an especial interest and importance.	3.47	Very High (Strongly Agree)	11.5
7.The school provides constructive and accurate assessment for my peers and I am comfortable criticizing other students' responses.	3.49	Very High (Strongly Agree)	8.5
8. The school provides traditional methods In assessing problem-solving.	3.32	Very High (Strongly Agree)	15
9. The school provides research place in the first module of the course.	3.47	Very High (Strongly Agree)	11.5
10. The school provides strategies and the existence of multiple solutions or reflection on the solution.	3.47	Very High (Strongly Agree)	11.5
11. The school provides my participation in any internships, Co-op programs, or other work-based learning experiences related to STEM major.	3.49	Very High (Strongly Agree)	8.5
12. The school is confident in my ability in applying STEM knowledge and skills in a professional setting.	3.53	Very High (Strongly Agree)	6.5
13. The school is confident in my ability in obtaining, evaluating, and communicating information.	3.47	Very High (Strongly Agree)	11.5
14. The school is confident in my ability in engaging in argument from evidence.	3.62	Very High (Strongly Agree)	1.5
15. The school is confident in my ability in analyzing and interpreting data.	3.62	Very High (Strongly Agree)	1.5
Average Weighted Mean	**3.51**	**Very High (Strongly Agree)**	

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Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
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Table 2 presents schools' level of readiness in terms of teachers training. Indicators 14 and 15 "The school is confident in in my ability in engaging in argument from evidence", and" The school is confident in my ability inanalyzing and interpreting data", had obtained the same weighted mean of 3.62, verbally interpreted as "very high", and were ranked 1.5, respectively, indicator 3 "The school provides necessary resources to support STEM education", had obtained a weighted mean of 3.60, verbally interpreted as "very high" and was ranked 3, indicator 5 "The school provides STEM concepts taught in a way that is relevant to local context", had obtained a weighted mean of 3.57, verbally interpreted as "very high", and was ranked 4, indicator 2 "The school is confident in my ability in teaching STEM subjects.", had obtained a weighted mean of 3.55, and verbally interpreted as "very high" and was ranked 5, and indicator 12 "The school is confident in my ability in applying STEM knowledge and skills in a professional setting", has obtained a weighted mean of 3.53, verbally interpreted as "very high", and was ranked 6.5.

On the other hand, indicator 8 "The school provides traditional methods In assessing problem-solving", had obtained a weighted mean of 3.32, verbally interpreted as "very high", and was ranked 15, indicator 1 "The school provides formal training in teaching STEM subjects", had obtained a weighted mean of 3.45, verbally interpreted as "very high", and was ranked 14, indicators 6, 9, 10, 13 "The school acquires my peer assessment ", "The school provides research place in the first module of the course ", "The school provides strategies and the existence of multiple solutions or reflection on the solution.", "The school is confident in my ability in obtaining, evaluating, and communicating information", had obtained equal weighted mean of 3.47, verbally interpreted as "very high", and were ranked 11.5, and indicators 11 and 7, "The school provides my participation in any internships, Co-op programs, or other work-based learning experiences ", "The school provides constructive and accurate assessment for my peers and I am comfortable criticizing other students' responses', had obtained the same weighted mean of 3.47, verbally interpreted as "very high" and were ranked 8.5, respectively.

To sum up, an average weighted mean of 3.51 revealed that schools' level of readiness along teacher training was very high. The results imply that the school is confident in teachers' ability in analyzing and interpreting data and the school is confident in teachers' ability in engaging in argument from evidence. The result supports the study made by Samuel and Cindi, (2020), The Influence of School Readiness on Teacher Retention and Performance: A Case Study of Schools in the Eastern Cape, South Africa. The study examines the relationship between school readiness and teacher retention and performance, with a focus on schools in a specific region of South Africa.

Likewise, Duran, (2021) focused on the role of teacher professional development in promoting STEM education in K-12 schools. The review found that effective professional development programs for STEM teachers were those that provided ongoing support, included opportunities for collaboration and reflection, and emphasized the development of pedagogical content knowledge.

Table 3
Schools' Level of Readiness: Curriculum

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. The school curriculum includes STEM education.	3.79	Very High (Strongly Agree)	1

2. The school curriculum resources support STEM education.	3.62	Very High (Strongly Agree)	7
3. The school curriculum integrates STEM education across multiple subjects.	3.74	Very High (Strongly Agree)	2
4. The school curriculum provides opportunities for hands-on, inquiry-based learning.	3.57	Very High (Strongly Agree)	12
5. The school curriculum addressed real-world problems through STEM education.	3.55	Very High (Strongly Agree)	14.5
6. The school curriculum does have a dedicated curriculum or program.	3.58	Very High (Strongly Agree)	9.5
7. The school curriculum has Adequate resources (such as laboratory equipment, technology, and materials) to support STEM education.	3.57	Very High (Strongly Agree)	12
8. The school curriculum has opportunities for students to engage in extracurricular STEM activities (such as clubs, competitions, or events.	3.62	Very High (Strongly Agree)	7
9. The school curriculum has Qualified and trained teachers to teach STEM subjects.	3.68	Very High (Strongly Agree)	3
10. The school curriculum offers professional development opportunities for teachers to enhance their STEM teaching skills.	3.58	Very High (Strongly Agree)	9.5
11. The school have dedicated STEM curriculum or program.	3.66	Very High (Strongly Agree)	4.5
12. The school curriculum adequately prepared in pursuing a career in STEM.	3.66	Very High (Strongly Agree)	4.5
13. The school curriculum can evolve to Include material design, technology, pedagogical theories and teaching methods and now used daily in a variety of learning situations.	3.57	Very High (Strongly Agree)	12
14. The school curriculum can be Considerable as potential determinants of STEM education achievement.	3.55	Very High (Strongly Agree)	14.5
15. The school curriculum can work in groups of four to explore how mathematics and science is used along with Computational thinking practices and technical reading and writing.	3.62	Very High (Strongly Agree)	7
Average Weighted Mean	**3.62**	**Very High (Strongly Agree)**	

Table 3 shows schools' level of readiness in terms of curriculum. Indicator 1 "The school curriculum includes STEM education", had obtained a weighted mean of 3.79, verbally interpreted as "very high", and was ranked 1, Indicator 3 "The school curriculum integrates STEM education across multiple subjects", had obtained a weighted mean of 3.74, verbally interpreted as "very high" and was ranked 2,indicator 9 "The school curriculum has Qualified and trained teachers to teach STEM subjects" had obtained a weighted mean of 3.68, verbally interpreted as "very high", and was ranked 3, indicators 11 and 12 "The school have dedicated STEM curriculum, and"The school curriculum adequatelyprepared in pursuing a career in STEM", had obtained an equal weighted mean of 3.66, verbally interpreted as "very high", and were ranked 4.5, respectively, indicators 2, 8, 15 “The school curriculum resources support STEM education”, “The school curriculum has opportunities for students to engage in extracurricular STEM activities (such as clubs, competitions, or events”, and “The school curriculum can work in groups of four to explore how mathematics and science is used along with Computational thinking practices and technical reading and writing”, had obtained a weighted mean of 3.62, verbally interpreted as “very high”, and were ranked 7.

On the other hand, indicators 5 and 14 “The school curriculum addressed real-world problems through STEM education”, and “The school curriculum can be Considerable as potential determinants of STEM education achievement”, had obtained a weighted mean of 3.55 respectively, verbally interpreted as “very high”, and were ranked 14.5, indicators 4,7, and 13 “The school curriculum provides opportunities for hands-on, inquiry-based learning”,“The school curriculum has Adequate resources (such as laboratory equipment, technology, and materials) to support STEM education”, and “The school curriculum can evolve toInclude material design, technology, pedagogical theories and teachingmethods and now used daily in a variety of learning situations”, had obtaineda weighted mean of 3.57 respectively, verbally interpreted as “very high”, and were ranked 12, and Indicators 6 and 10 “The school curriculum does have a dedicated curriculum or program”, and “The school curriculum offers professional development opportunities for teachers to enhance their STEM teaching skills.”, had obtained a weighted mean of 3.58 respectively, verbally interpreted as “very high”, and were ranked 9.5.

To sum up, an average weighted mean of 3.62 revealed that level of schools’ readiness along curriculum was very high. This implies that the school curriculum includes STEM education and the school curriculum integrates STEM education across multiple subjects.

The findings support the Theory of Constructivist Learning Theory, Dash and Mishra, (2020), the study investigated the effectiveness of a constructive approach of students in mathematics. It emphasizes the importance of engaging students in hand-on, problem-based activities that enable them to construct their understanding of STEM concepts.

Likewise, Oliver, (2020) examined the effectiveness of various STEM education initiatives in preparing students for higher education in STEM fields. The review found that initiatives that emphasized the development of students' STEM skills, interests, and identities were most effective in promoting STEM readiness.

Table 4
Composite Table of Schools’ Level of Readiness

Indicators	**Weighted Mean**	**Verbal Interpretation**	**Rank**
1. Funding Resources	3.30	Very High (Strongly Agree)	3
2. Teacher Training	3.51	Very High (Strongly Agree)	2
3. Curriculum	3.62	Very High (Strongly Agree)	1
Overall Weighted Mean	**3.48**	**Very High (Strongly Agree)**	

Table 4 shows the composite table of schools’ level of readiness along funding resources, teachers’ training, and curriculum. Indicator 3 “curriculum”, had obtained a weighted mean of 3.62, verbally interpreted as “very high” and was ranked 1, indicator 2 “teacher training”, had obtained a weighted mean of 3.51, and verbally interpreted as “very high”, and

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Technium Social Sciences Journal
Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
www.techniumscience.com

was ranked 2, and indicator 1 "funding resources", had obtained a weighted mean of 3.30, verbally interpreted as "very high" and was ranked 3.

To sum up, an average weighted mean of 3.48 revealed that schools' level of readiness along funding resources, teachers training and curriculum was very high. This means that schools can access to resources such as laboratories, computers, and other equipment to support STEM education. This includes providing students with up-to-date tools and technology to enhance their learning experiences. Schools can should provide their teachers with adequate training and professional development opportunities to keep them up-to-date with the latest teaching methods and technology. For curriculum alignment for STEM education, the school can acquire a curriculum that is aligned with industry standards and relevant to the needs of the local economy. Schools should ensure that their STEM curriculum is rigorous and prepares students for college and career readiness.

The findings support the study of Adedokum, et al., (2020), schools' readiness focused on the effectiveness of various interventions aiming at improving students' STEM skills and interest in K to 12 educations. They found that interventions that were hands-on, inquiry -based, and integrated across STEM subjects were most effective in improving students STEM readiness.

Likewise, A review by Sillitto, (2021) focused on the role of technology in promoting STEM education in K-12 schools. The review found that technology could be effective in supporting inquiry-based learning, promoting collaboration and communication, and providing access to real-world data and experiences.

Table 5
Teachers' Level of Proficiency: Pedagogy

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. I am familiar with using technology in the classroom.	3.81	Very High (Strongly Agree)	1
2. I can understand the content knowledge related to STEM subjects.	3.72	Very High (Strongly Agree)	4.5
3. I can use inquiry-based learning pedagogies in my STEM teaching.	3.66	Very High (Strongly Agree)	11
4. I can use problem -based learning pedagogies in my STEM teaching.	3.68	Very High (Strongly Agree)	9.5
5. I have an ability to integrate STEM concepts into my teaching.	3.79	Very High (Strongly Agree) Very High	2
6. I can include opportunities in STEM curriculum for students to engage in open-ended inquiry.	3.75	Very High (Strongly Agree)	3
7. I regularly use assessment data to adjust my teaching strategies and support student learning in STEM.	3.57	Very High (Strongly Agree)	14
8. I have a long- term plan for integrating STEM education across the curriculum.	3.64	Very High (Strongly Agree)	12
9. I have a strong leadership and clear understanding of the benefits of STEM education.	3.70	Very High (Strongly Agree)	7
10. I can use the adequate resources (e.g., equipment, technology) to support effective STEM education.	3.72	Very High (Strongly Agree)	4.5
11. I participated in any professional development related to teaching STEM	3.60	Very High (Strongly Agree)	13

subjects.			
12. I feel that my professional development has improved my teaching practices in STEM subjects.	3.70	Very High (Strongly Agree)	7
13. I can apply automating solutions through algorithmic thinking (a series of ordered steps)	3.47	Very High (Strongly Agree)	15
14. I can identify, analyze, and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources.	3.70	Very High (Strongly Agree)	7
15. I can project staff modelled problem based learning, flipped learning, and instructional technology.	3.68	Very High (Strongly Agree)	9.5
Average Weighted Mean	**3.68**	**Very High (Strongly Agree)**	

Table 5 shows teachers' level of proficiency along pedagogies. Indicator 1 "I am familiar with using technology in the classroom", had obtained a weighted mean of 3.81, verbally interpreted as "very high" and was ranked 1., indicator 5 "I have an ability to integrate STEM concepts into my teaching", had obtained a weighted mean of 3.79, verbally interpreted as "very high", and was ranked 2, indicator 6 "I can include opportunities in STEM curriculum for students to engage in open-ended inquiry", had obtained a weighted mean of 3. 75, verbally interpreted as "very high", and was ranked 3, indicators 2 and 10 "I can understand the content knowledge related to STEM subjects", had obtained a weighted mean of 3.72 respectively, verbally interpreted as "very high", and were ranked 4.5, and indicators 9,12, and 14, "I have a strong leadership and clear understanding of the benefits of STEM education". "I feel that my professional development has improved my teaching practices in STEM subjects", and "I can identify, analyze, and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources", had obtained an equal weighted mean of 3.70, verbally interpreted as "very high", and were ranked 7 respectively.

On the other hand, indicator 13 "I can apply automating solutions through algorithmic thinking (a series of ordered steps)" had obtained a weighted mean of 3.47, verbally interpreted as "very high", and was ranked 15, indicator 11 "I participated in any professional development related to teaching STEM subjects", had obtained a weighted mean of 3.60, verbally interpreted as "very high", and was ranked 13, indicator 8 "I have a long- term plan for integrating STEM education across the curriculum", had obtained a weighted mean of 3.64, verbally interpreted as "very high" and was ranked 12,indicator 3, "I can use inquiry-based learning pedagogies in my STEM teaching", had obtained a weighted mean of 3.66, verbally interpreted as "very high", and was rank 11. Indicators 15 and 4 "I can project staff modelled problem-based learning, flipped learning, and instructional technology", and "I can use problem -based learning pedagogies in my STEM teaching", had obtained the same weighted mean of 3.68, verbally interpreted as "very high", and were rank 9.5.

To sum up, an average weighted mean of 3.68 revealed that teachers' level of proficiency along pedagogies was very high. This means that teachers are familiar with using technology in the classroom and has an ability to integrate STEM concepts into their teaching.

The findings, support the study of Grossman et al., (2020), pedagogies can be defined as "the art and science of teaching, encompassing the strategies, techniques, and practices that teachers use to facilitate student learning"

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Technium Social Sciences Journal
Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
www.techniumscience.com

Likewise, a study of "Integrating STEM Pedagogical Content Knowledge into Teacher Education Programs" (Riggs & Akcay, 2018). They proposed a framework for integrating STEM pedagogical content knowledge into teacher education programs. The authors argue that this integration can help prepare future teachers to effectively teach STEM subjects.

Table 6

Teachers' Level of Proficiency:Qualification and Training

Indicators	**Weighted Mean**	**Verbal Interpretation**	**Rank**
1. I have the highest degree in a STEM related field.	3.32	Very High (Strongly Agree)	14
2. I have training received in teaching STEM subjects.	3.25	Very High (Strongly Agree	15
3. I am confident in my ability to teach STEM subjects.	3.57	Very High (Strongly Agree	3
4. I understand the content knowledge related to STEM subjects.	3.51	Very High (Strongly Agree	7.5
5. I use inquiry-based learning pedagogies in my STEM teaching.	3.58	Very High (Strongly Agree	2
6. I have access to ongoing professional learning opportunities to support their STEM teaching.	3.42	Very High (Strongly Agree	12.5
7. I do collaboration with other to develop and share effective STEM teaching practices.	3.62	Very High (Strongly Agree	1
8. I understand that identifying teachers' perceptions of scientific literacy is essential for raising students' scientific literacy.	3.51	Very High (Strongly Agree	7.5
9. I can increase awareness of instruments as a key tool for measuring the development of scientific literacy perceptions in prospective science teachers.	3.55	Very High (Strongly Agree	4.5
10. I can present exploratory factor analysis and confirmatory factor analysis results of a draft instrument assessing student literacy perceptions.	3.49	Very High (Strongly Agree	9
11. I can apply the context of CT, (Computational thinking) practices and technical reading and writing within mathematics and science.	3.43	Very High (Strongly Agree	11
12. I can support collaborative learning for STEM education purposes using indicators of students' learning outcomes and the level of their engagements as well as to determine the most effective benchmarks for teams forming.	3.53	Very High (Strongly Agree	6
13. I can investigate the concrete technologies of collaborative learning for proficiency purposes with the help of computer-supported learning in the system of teaching.	3.47	Very High (Strongly Agree	10
14. I often do collaboration with other STEM teachers in my school.	3.55	Very High (Strongly Agree	4.5
15. I often do collaboration with STEM Teachers from other school in my region.	3.42	Very High (Strongly Agree	12.5
Average Weighted Mean	**3.48**	**Very High**	

Technium Social Sciences Journal
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ISSN: 2668-7798
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	(Strongly Agree

Table 6 shows teachers' level of proficiency in terms of qualification and training. Indicator 7 "I do collaboration with other to develop and share effective STEM teaching practices", had obtained a weighted mean of 3.62, verbally interpreted as "very high", and was ranked 1, indicator 5 "I use inquiry-based learning pedagogies in my STEM teaching", had obtained a weighted mean of 3.58, verbally interpreted as "very high", and was ranked 2, indicator 3 "I am confident in my ability to teach STEM subjects", had obtained a weighted mean of 3.57, verbally interpreted as " very high", and was ranked 3, indicator 9 and 14 "I can increase awareness of instruments as a key tool for measuring the development of scientific literacy perceptions in prospective science teachers", and "I often do collaboration with other STEM teachers in my school", had obtained a weighted mean of 3.55 respectively, verbally interpreted as "very high", and were ranked 4.5, and indicator 12 "I can support collaborative learning for STEM education purposes using indicators of students' learning outcomes and the level of their engagements as well as to determine the most effective benchmarks for teams forming", had obtained a weighted mean of 3.53, verbally interpreted as "very high", and was ranked 6.

On the other hand, indicator 2 "I have training received in teaching STEM subjects", had obtained a weighted mean of 3.25, verbally interpreted as "very high", and was ranked 15, indicator 1, which states "I have the highest degree in a STEM related field", had obtained a weighted mean of 3.25, verbally interpreted as "very high", and was ranked 14, indicator 6, which states "I have access to ongoing professional learning opportunities to support their STEM teaching", had obtained a weighted mean of 3.42, verbally interpreted as "very high", and was ranked 12.5, indicator 11, which states "I can apply the context of CT, (Computational thinking) practices and technical reading and writing within mathematics and science", had obtained a weighted mean of 3.43, verbally interpreted as "very high", and was ranked as 11, and indicator 13, which states "I can investigate the concrete technologies of collaborative learning for proficiency purposes with the help of computer-supported learning in the system of teaching", had obtained a weighted mean of 3.47, verbally interpreted as "very high", and was ranked 10.

To sum up, an average weighted mean of 3.48 revealed that teachers' level of proficiency in terms of qualification and training was very high. The results imply that teachers do collaboration with other to develop and share effective STEM teaching practices and use inquiry-based learning pedagogies in their STEM teaching.The result supports the study made by Roseth et al., (2018). Effective classroom instruction involves a combination of instructional strategies, such as direct instruction, inquiry-based learning, and cooperative learning. It also requires careful planning and preparation, including the selection of appropriate learning materials, assessment strategies, and instructional technologies. Effective classroom instruction should be responsive to the diverse learning needs of students and provide opportunities for active engagement and reflection.

Moreover, the study of Exploring Secondary Teachers' Pedagogical Content Knowledge for STEM Teaching: A Case Study in Senior High Schools in the Philippines" (Vibar & Asido, 2020) examined the pedagogical content knowledge (PCK) of STEM teachers in Senior High School in the Philippines. The authors found that effective STEM instruction requires a deep understanding of content and how to teach it, as well as a willingness to experiment with different teaching strategies and adapt to students' needs.

The result supports the study made by Saleh and Al-Hassan, (2020), they go on to argue that qualification and training are closely linked to employee performance, and that organizations must invest in both in order to remain competitive in today's rapidly changing business environment.

Likewise, in the study of "Professional Development for STEM Teachers: A Review of the Literature" (Luft et al., 2021), synthesizes research on professional development programs for STEM teachers. The authors conclude that effective programs should be content-specific, focused on inquiry-based teaching, provide opportunities for collaboration and reflection, and be sustained over time.

Table 7
Teachers' Level of Proficiency: Classroom Instruction

Indicators	**Weighted Mean**	**Verbal Interpretation**	**Rank**
1. I receive professional development related to teaching STEM subjects.	3.40	Very High (Strongly Agree)	14
2. I integrate STEM concepts into my science teaching.	3.42	Very High (Strongly Agree)	13
3. I use problem-based learning pedagogies in my STEM teaching.	3.53	Very High (Strongly Agree)	9
4. I understand well the content knowledge to STEM subjects.	3.55	Very High (Strongly Agree)	6.5
5. I feel confident in my ability to teach STEM subjects effectively.	3.55	Very High (Strongly Agree)	6.5
6. I can contribute to conceptual and attitudinal changes of teachers experience in terms of mathematics and science- specific technological pedagogical content knowledge.	3.38	Very High (Strongly Agree)	15
7. I can participate on teacher' use of disciplinary CT (Computational Thinking) strategies as applied to middle and high school mathematics and science.	3.45	Very High (Strongly Agree)	12
8. I can participate on teacher self-efficacy regarding teaching technical reading and writing strategies.	3.47	Very High (Strongly Agree)	10.5
9. I can formulate problems in a way that enables us to use a computer and other tools to help solve them,	3.47	Very High (Strongly Agree)	10.5
10. I can logically organize and analyzing data.	3.55	Very High (Strongly Agree)	6.5
11. I often do participation in networking activities related to STEM education.	3.55	Very High (Strongly Agree)	6.5
12. I understand well the content knowledge related to STEM subjects.	3.58	Very High (Strongly Agree)	2
13. I can contribute opportunities for hands-on experience.	3.57	Very High (Strongly Agree)	4
14. I can be a mentor and or advisor.	3.58	Very High (Strongly Agree)	2
15. I can contribute to the level of preparedness for a career in STEM.	3.58	Very High (Strongly Agree)	2
Average Weighted Mean	**3.51**	**Very High (Strongly Agree)**	

Table 7 presents teachers' level of proficiency along classroom instruction. Indicators 12,14, and 15, which state, "I understand well the content knowledge related to STEM subjects", "I can be a mentor and or advisor", and "I can contribute to the level of preparedness for a career in STEM", had obtained an equal weighted mean of 3.58, verbally interpreted as "very high", and were ranked 2, indicator 13, which states "I can contribute opportunities for hands-on experience", had obtained a weighted mean of 3.57, verbally interpreted as "very high", and was ranked 4, indicators 4,5,10, and 11, which state "I understand well the content knowledge to STEM subjects", "I feel confident in my ability to teach STEM subjects effectively", "I can logically organize and analyzing data", and" I often do participation in networking activities related to STEM education", had obtained a weighted mean of 3.55 respectively, verbally interpreted as "very high", and were ranked 6.5,indicator 3, "I use problem-based learning pedagogies in my STEM teaching", had obtained a weighted mean of 3.55, verbally interpreted as "very high", and was ranked 9, and indicators 8 and 9 "I can participate on teacher self-efficacy regarding teaching technical reading and writing strategies", "I can formulate problems in a way that enables us to use a computer and other tools to help solve them", had obtained a weighted mean of 3.47, verbally interpreted as "very high", and were ranked 10.5 respectively.

On the other, indicator 6, which states "I can contribute to conceptual and attitudinal changes of teachers experience in terms of mathematics and science- specific technological pedagogical content knowledge", had obtained a weighted mean of 3.38, verbally interpreted as "very high", and was ranked 15, indicator 1, which states "I receive professional development related to teaching STEM subjects", had obtained a weighted mean of 3.40, verbally interpreted as "very high", and was ranked 14, indicator 2, "I integrate STEM concepts into my science teaching", had obtained a weighted mean of 3.42, verbally interpreted as "very high", and was ranked 13, and indicator 7, "I can participate on teacher' use of disciplinary CT (Computational Thinking) strategies as applied to middle and high school mathematics and science", had obtained a weighted mean of 3.45, verbally interpreted as "very high" and was ranked 12.

To sum up, an average weighted mean of 3.51, revealed that teachers' level of proficiency along classroom instruction was very high. The results imply that they can contribute to the level of preparedness for a career in STEM and can be a mentor and or advisor.

The result supports the study made by Roseth et al., (2018). Effective classroom instruction involves a combination of instructional strategies, such as direct instruction, inquiry-based learning, and cooperative learning. It also requires careful planning and preparation, including the selection of appropriate learning materials, assessment strategies, and instructional technologies. Effective classroom instruction should be responsive to the diverse learning needs of students and provide opportunities for active engagement and reflection.

Moreover, the study of Exploring Secondary Teachers' Pedagogical Content Knowledge for STEM Teaching: A Case Study in Senior High Schools in the Philippines" (Vibar & Asido, 2020) examined the pedagogical content knowledge (PCK) of STEM teachers in Senior High School in the Philippines. The authors found that effective STEM instruction requires a deep understanding of content and how to teach it, as well as a willingness to experiment with different teaching strategies and adapt to students' needs.

Table 8
Teachers' Level of Proficiency: Adequate Resources

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. I often have access to computers and other technological resources in my STEM classroom	3.62	Very High (Strongly Agree)	4.5
2. I often have access to laboratory equipment and supplies in my STEM classroom.	3.47	Very High (Strongly Agree)	13
3. I often do feel that the available resources in my STEM teaching.	3.57	Very High (Strongly Agree)	9
4. I often do use online resources and materials for my STEM teaching.	3.62	Very High (Strongly Agree)	4.5
5. I often do feel that the available resources in my STEM classroom support student learning.	3.62	Very High (Strongly Agree)	4.5
6. As a teacher I received adequate physical resources that affects my perception of the quality of the teaching environment.	3.57	Very High (Strongly Agree)	9
7. As a teacher, the improvement of teaching environment with adequate staffing levels and appropriate allocation of physical resources are achievable to resolve the challenge and thus improve outcomes.	3.72	Very High (Strongly Agree)	1
8. As a teacher, the issue of teaching personnel shortage has become a concern for administrators and a major challenge for educational system.	3.57	Very High (Strongly Agree)	9
9. As a teacher, the lack of well qualified teachers has been considered as one of the most important barriers to achieve effective educational systems.	3.53	Very High (Strongly Agree)	11.5
10. As a teacher, the provision of well qualified teachers and appropriate teacher-student ratios play a vital role in ensuring students positive outcomes.	3.62	Very High (Strongly Agree)	4.5
11. I can be considerable as potential determinants of STEM Education achievements.	3.40	Very High (Strongly Agree)	15
12. I feel adequately prepared to pursue a career in STEM.	3.45	Very High (Strongly Agree)	14
13. I can improve STEM education to better prepare students for a career in STEM.	3.64	Very High (Strongly Agree)	2
14. I can construct explanations and design solutions.	3.53	Very High (Strongly Agree)	11.5
15. I am confident in my ability to obtain, evaluate and communicate information.	3.58	Very High (Strongly Agree)	7
Average Weighted Mean	**3.57**	**Very High (Strongly Agree)**	

Table 8 presents teachers' level of proficiency along adequate resources. Indicator 7, which states "As a teacher, the improvement of teaching environment with adequate staffing levels and appropriate allocation of physical resources are achievable to resolve the challenge and thus improve outcomes", had obtained a weighted mean of 3.72, verbally interpreted as "very high", and was ranked 1, indicator 13, which states "I can improve STEM education to better prepare students for a career in STEM", verbally interpreted as "very high", and was ranked 2, indicators 1, 4, 5, and 10 which state "I often have access to computers and other technological resources in my STEM classroom", "I often do use online resources and materials for my STEM teaching", "I often do feel that the available resources in my STEM classroom support student learning", and "As a teacher, the provision of well qualified teachers and appropriate teacher-student ratios play a vital role in ensuring students positive outcomes", had obtained the same weighted mean of 3.62 respectively, verbally interpreted as "very high", and were ranked 4.5, indicator 15, which states "I am confident in my ability to obtain, evaluate and communicate information", had obtained a weighted mean of 3.58, verbally interpreted as "very high", and was ranked 7, and indicators 3,6, and 8, which state "I often do feel that the available resources in my STEM teaching", "As a teacher I received adequate physical resources that affects my perception of the quality of the teaching environment", and "As a teacher, the issue of teaching personnel shortage has become a concern for administrators and a major Challenge for educational system Challenge for educational system had obtained the same weighted mean of 3.57, verbally interpreted as "very high", and were ranked 9.

On the other hand, indicator 11, which states "I can be considerable as potential determinants of STEM Education achievements", had obtained a weighted mean of 3.40, verbally interpreted as "very high", and was ranked 15, indicator 2, which states "I often have access to laboratory equipment and supplies in my STEM classroom", had obtained a weighted mean of 3.47, verbally interpreted as "very high", and was ranked 13, and indicators 9 and 14, which state "As a teacher, the lack of well qualified teachers has been considered as one of the most important barriers to achieve effective educational systems", and "I can construct explanations and design solutions", had obtained a weighted mean of 3.53, verbally interpreted as very high , and were ranked 11.5

To sum up, an average weighted mean of 3.57 revealed that teachers' level of proficiency along adequate resources was very high. The results imply that teacher's improvement of teaching environment with adequate staffing levels and appropriate allocation of physical resources are achievable to resolve the challenge and thus improve outcomes and can improve STEM education to better prepare students for a career in STEM

The result supports the study of Baker and Weber, (2020). They go on to argue that adequacy is not simply a matter of providing a certain level of funding or resources, but rather requires a more nuanced understanding of the complex interplay between inputs, processes, and outcomes in education.

Also, the study of "Equity in STEM Education: Finding the Path Forward" by Corbett and Hill (2021) reviews research on the barriers to achieving equity in STEM education and proposes strategies for addressing them. The authors emphasize the importance of providing resources and opportunities for underrepresented groups, such as girls and students from low-income families.

Table 9

Composite Table of Teachers' Level of Proficiency

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Pedagogies	3.68	Very High (Strongly Agree)	1
2. Qualification and Trainings	3.48	Very High (Strongly Agree)	4
3. Classroom Instructions	3.51	Very High (Strongly Agree)	3
4. Adequate Resources	3.58	Very High (Strongly Agree)	2
Over all Weighted Mean	**3.56**	**Very High (Strongly Agree)**	

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Technium Social Sciences Journal
Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
www.techniumscience.com

Table 9 shows the composite table of teachers' level of proficiency along pedagogies, qualification and trainings, classroom instructions and adequate resources. Indicator 1 "Pedagogies" had obtained a weighted mean of 3.68, verbally interpreted as "very high", and was ranked 1, indicator 4 "Adequate Resources" had obtained 3.58, verbally interpreted as "very high" and was ranked 2, indicator 3 "Classroom Instruction" had obtained a weighted mean of 3.51, verbally interpreted as "very high" and was ranked 3, and indicator 2 "Qualification and Trainings" had obtained a weighted mean of 3.48, verbally interpreted as "very high" and was ranked 4.

To sum up, an average weighted mean of 3.56 revealed that teachers' level of proficiency was very high. This means that teachers acquired a deep understanding of both the content they are teaching (i.e. science, technology, engineering, or mathematics) and the best pedagogical practices for teaching that content.

The findings support the theory of Pedagogical Content Knowledge. PCK theory argues that teachers who have strong content knowledge but lack pedagogical knowledge may struggle to effectively teach their subject matter. This was cited from the study of Jiang, (2020). This study explores the effectiveness of a professional development program for STEM teachers that focused on developing their pedagogical content knowledge. Results showed that the program improved teachers' knowledge and confidence in teaching STEM content.

Likewise, the study of "Teacher Perspectives on Accessing STEM Learning Resources in Under-resourced Schools" by Appleton et al. (2021). This study examines the challenges faced by teachers in under-resourced schools when trying to access STEM learning resources, and the strategies they use to overcome those challenges. The authors highlight the need for more support and funding to ensure that all students have access to high-quality STEM education.

Table 10
STEM Students' Level of Preparedness for Higher Education

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. The student is confident in their Math and Science skills.	3.43	Very High (Strongly Agree)	10
2.The student is confident in his problem-solving and critical thinking skills.	3.53	Very High (Strongly Agree)	7.5
3. The student is actively participating in any STEM-related extracurricular activities (e.g robotics club, science fair and math competition)	3.58	Very High (Strongly Agree)	5
4. The student has conducted research or participated in research programs that has prepared him for college-level studies.	3.64	Very High (Strongly Agree)	3
5. The student has explored potential career paths in STEM fields and feel confident in his career choices.	3.72	Very High (Strongly Agree)	1
6. The student is aware of scholarship or financial aid opportunities available for STEM students.	3.62	Very High (Strongly Agree)	4
7. The student has taken advanced STEM	3.53	Very High	7.5

courses in senior high school (e.g. honors, AP, IB) that has challenged and prepared him for higher education.		(Strongly Agree)	
8. The student has any experience working in a team to solve STEM-related problems or complete a project?	3.49	Very High (Strongly Agree)	9
9. The student has participation in STEM-Related internships or work experiences that will help him pursue his career goals.	3.55	Very High (Strongly Agree)	6
10. The student is interested in pursuing a STEM-related career in the future.	3.70	Very High (Strongly Agree)	2
Average	**3.58**	**Very High (Strongly Agree)**	

Table 10 shows STEM students' level of preparedness for higher education. Indicator 5, which state "The student has explored potential career paths in STEM fields and feel confident in his career choices" had obtained a weighted mean of 3.72, verbally interpreted as "very high" and was ranked 1, indicator 10 "The student is interested in pursuing a STEM-related career in the future" had obtained a weighted mean of 3.70, verbally interpreted as "very high" and was ranked 2, indicator 4 "The student has conducted research or participated in research programs that has prepared him for college-level studies" had obtained a weighted mean of 3.64, verbally interpreted as "very high" and was ranked 3, indicator 6 "The student is aware of scholarship or financial aid opportunities available for STEM students" had obtained a weighted mean of 3.62, verbally interpreted as "very high" and was ranked 4, and indicator 3 "The student is actively participating in any STEM-related extracurricular activities (e.g robotics club, science fair and math competition)" had obtained a weighted mean of 3.58, verbally interpreted as "very high" and was ranked 5.

On the other hand, indicator 1 "The student is confident in their Math and Science skills" had obtained a weighted mean of 3.43, verbally interpreted as "strongly agree" and was ranked 10, indicator 8 "The student has any experience working in a team to solve STEM-related problems or complete a project?" had obtained a weighted mean of 3.49, verbally interpreted as "very high" and was ranked 9, indicators 2 and 7, which state "The student is confident in his problem- solving and critical thinking skills" and "The student has taken advanced STEM courses in senior high school (e.g. honors, AP, IB) that has challenged and prepared him for higher education" had obtained a weighted mean of 3.53 respectively, verbally interpreted as "very high" and were ranked 7.5, indicators 2 and 7 "The student is confident in his problem- solving and critical thinking skills" and "The student has taken advanced STEM courses in senior high school (e.g. honors, AP, IB) that has challenged and prepared him for higher education" had obtained a weighted mean of 3.53, verbally interpreted as "very high" and were ranked 7.5, and indicator 9 "The student has participation in STEM- Related internships or work experiences that will help him pursue his career goals" had obtained a weighted mean of 3.55, verbally interpreted as "very high" and was ranked 6.

To sum up, an average weighted mean of 3.58 revealed that STEM students' level of preparedness for higher education was very high. This means that students' preparedness for higher education can achieve to the extent in which students have explored potential career paths in STEM fields and feel confident in their career choices and are interested in pursuing a STEM-related career in the future.

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Technium Social Sciences Journal
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ISSN: 2668-7798
www.techniumscience.com

The finding supports the study of Ding et al., (2021), the degree to which students have developed the skills, knowledge, and disposition necessary for success in higher education, with higher levels indicating greater preparedness.

Likewise, the study of “Self-efficacy is a key factor” it is a key factor in STEM students' preparedness for higher education (Eccles & Wigfield, 2019). Students who believe in their ability to succeed in STEM programs are more likely to persist and succeed in these programs.

Table 11
Relationship between Schools' level of Readiness and Teachers' level of Proficiency

Schools' Level of Readiness	**Teachers' Level of Proficiency**			
	Pedagogies-skills & knowledge	Qualifications & Training	Classroom Instruction	Adequate Resources
Funding Resources	r=0.497** Moderate correlation p=0.000	r=0.370** Low correlation p=0.006	r=0.178 Low correlation p=0.203	r=0.237 Low correlation p=0.087
Teacher Training	r=0.239 Low correlation p=0.084	r=0.250 Low correlation p=0.071	r=0.456** Moderate correlation p=0.001	r=0.357** Low correlation p=0.009
Curriculum	r=0.607** Moderate correlation p=0.000	r=0.632** Moderate correlation p=0.000	r=0.565** Moderate correlation p=0.000	r=0.535** Moderate correlation p=0.000

**Significant @ 0.01

Table 11 presents the relationship between schools' level of readiness and the teachers' level of proficiency. As seen, there was a significant relationship between respondents' schools' level of readiness along funding resources and teachers' level of proficiency along pedagogies (r=0.497; p=.000<.01); schools' level of readiness along funding resources and teachers' level of proficiency along qualifications and training (r=0.370; p=.006<.01). This means that the higher the respondents' schools' level of readiness along funding resources, the higher is the respondents' teacher's level of proficiency in terms of pedagogies and qualification and training. Further, there was no significant relationship between schools' level of readiness along funding resources and teachers' level of proficiency along classroom instruction (r=0.178; p=0.203>.01); and schools' level of readiness along funding resources and teachers' level of proficiency along adequate resources (r=0.237; p=0.087>.01).

Moreover, as seen, there was a significant relationship between schools' level of readiness along with teacher training and teachers' level of proficiency along classroom instruction (r=0.456, p=0.001<0.01; and schools' level of readiness along teachers training and teachers' level of proficiency along adequate resources (0.357, p=0.009<0.01). This means that the higher is the level of schools' readiness along teacher training, the higher is the level teachers' proficiency in terms of classroom instruction and adequate resources. Further, there was no significant relationship between schools' level of readiness along teachers training and teachers' level along pedagogies (r=0.239; p=0084.>.01); and schools' level of readiness along teachers training and teachers' level of proficiency along qualifications and training (r=0.250; p=0.071>.01).

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ISSN: 2668-7798
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Likewise, as seen, there was a significant relationship betweenschools' level of readiness along curriculum andteachers' level of proficiency along pedagogies (r=0.607, p=0.000<0.01; schools' level of readiness along curriculum andteachers' level of proficiency alongqualification and training (0.632, p=0.000<0.01), schools' level of readiness along curriculum andteachers' level of proficiency alongclassroom instructions (r=0.565, p=0.00<0.01); andschools' level of readiness along curriculum andteachers' level of proficiency along adequate resources (r=0.535, p=0.000<0.01). This means that the higher is the level of schools' readiness along curriculum, the higher is the level teachers' proficiency in terms of pedagogies, qualification and trainings, classroom instruction and adequate resources.

The result support the study of "Infrastructure and resources are necessary for effective STEM education" Baska et al. (2020) found that schools' readiness for STEM education was closely tied to their access to resources such as technology, funding, and professional development. Schools with limited resources were less likely to effectively implement STEM education.

Table 12

Relationship between the Schools' Level of Readiness and STEM Students' Level of Preparedness for Higher Education

Schools' Level of Readiness	Pearson r	p-value	Interpretation
Funding Resources	0.229 Low correlation	0.099	Not Significant
Teacher Training	0.422** Moderate correlation	0.000	Significant
Curriculum	0.466** Moderate correlation	0.000	Significant
**Significant @ 0.01			

Table 12 presents the relationship between schools' level of readiness and STEM students' level of preparedness, the table showed that the obtained p-values for funding resources=0.099 was greater than the level of significance@ 0.01, therefore, no significant relationship was noted. The result implies that theschools' level of readiness has nothing to do with students' level of preparedness for higher education may be the student had a strong personal motivation, a student's desire and motivation to succeed in higher education can play a significant role in their preparedness, regardless of their school's resources. Also, family supports matter. Students who come from families that prioritize education and provide support and resources for their education may be better prepared for higher education, regardless of their school's resources. On the other hand, the obtained p-values for teacher training= 0.000, curriculum=0.000 were all less than the level of significance @0.01, therefore, significant relationship was observed. The findings revealed that the higher the level of schools' readiness in terms of teacher training and curriculum, the higher the STEM students' level of preparedness

The findings support the study of Means et al., (2020), the level of schools' readiness for STEM education along funding and resources can be influenced by a range of factors, including external support, human resources, and equity consideration. For parental involvement, the study of Supplee, & Shaw, (2018), they found that students who had higher levels of parental involvement were more likely to enroll in postsecondary education than those with lower levels of parental involvement.

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Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
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Table 13
Relationship between Teachers' Level of Proficiency and STEM Students' Level of Preparedness for Higher Education

Teachers' Level of Proficiency	Pearson r	p-value	Interpretation
Pedagogies-skills and knowledge	0.230 Low correlation	0.098	Not Significant
Qualifications and training	0.262 Moderate correlation	0.058	Not Significant
Classroom instruction	0.519** Moderate correlation	0.000	Significant
Adequate resources	0.616** Moderate correlation	0.000	Significant
**Significant @ 0.01			

Table 13 showed the relationship between teachers' level of proficiency and STEM students' level of preparedness for higher education. The table shown that the obtained p-values for pedagogies= 0.098 and qualification and training=0.058 were all greater than the level of significance @ 0.01, therefore, no significant relationship were noted. The result implies that the teachers' level of proficiency has nothing to do with respondents' STEM students' level of preparedness for higher education. The result implies that the respondents' teachers' level of proficiency along pedagogies and qualification and training have nothing to do with STEM students' level of preparedness for higher education. Many other factors that can influence student preparedness. For example, prior academic preparation, students who come to school with a strong academic foundation, such as good reading and math skills, may be better prepared for the material presented by the teacher, regardless of the teacher's level of proficiency (Yohalem, & Wilson, 2018). Study on Family Support: Title: Parental Involvement and Postsecondary Enrollment: A Propensity Score Analysis Using the Education Longitudinal Study, in this study, the authors examined the relationship between parental involvement and postsecondary enrollment among a nationally representative sample of high school students. They found that students who had higher levels of parental involvement were more likely to enroll in postsecondary education than those with lower levels of parental involvement (Supplee & Shaw, 2018). Also, even the most proficient teacher may struggle to engage students if the curriculum is outdated or poorly designed.

On the other hand, the obtained p-values for classroom instruction=0.000 and for adequate resources=0.000 were all less than the level of significance@ 0.01, therefore, significant relationship were observed. The findings revealed that the higher the' level of teachers' proficiency in terms of classroom instruction and adequate resources, the higher the STEM students' level of preparedness for higher education.

The findings support the study of "The Impact of Teacher Professional Development on Student Achievement in STEM: A Meta-Analysis" by. Wayman and Gordon, (2019). This study examines the impact of teacher professional development on student achievement in STEM fields, finding that teacher professional development can have a positive impact on student achievement in STEM. Also, teachers' Proficiency can be defined as the ability to design, deliver and evaluate instructional practices that are aligned with the needs of individual learners and the goals of curriculum (Abulafia et al., 2021)

Technium Social Sciences Journal
Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
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Table 14
Stepwise Regression between the Schools' Level of Readiness and Teachers' Level of Proficiency taken singly or in Combination of STEM Students' Level of Preparedness for Higher Education

Predictor	Dependent Variable	R^2	F	p-value	β	t	p-value
Funding Resources	STEM students' level of preparedness	0.496	6.331	0.000	0.082	0.865	0.392
Teacher Training					0.104	0.843	0.403
Curriculum					0.299	1.778	0.082
Pedagogies-skills and knowledge					-0.356	-1.422	0.162
Qualifications and training					-0.511	-1.871	0.068
Adequate resources					0.273	0.947	0.349
Overall teachers' level of proficiency					0.799	1.164	0.251
Significance level @ 0.05							

As shown in Table 14, there was a multiple correlation between level of schools' readiness, level of teachers' proficiency, and level of STEM student's preparedness for higher education of selected private school. A value of 0.000 indicates a high level of prediction of the dependent variable (STEM Students' level of Preparedness for Higher Education). The obtained R square of 0.496 shows that independent variables (level of schools' readiness and level of teachers' proficiency) explain the variability of the dependent variable (STEM students' level of preparedness for higher education). Further, the ANOVA shows that the independent variable (schools' level of readiness-curriculum) statistically significantly predicted the dependent variable STEM students' level of preparedness for higher education with an F-value of 6.331 and a probability value of 0.000 which is less than the 0.05 significance level. This implies that the independent variables level of schools' readiness in terms of curriculum is the driver of the level of STEM students' preparedness for higher education, which further implies that curriculum as "a complex, dynamic, and contested entity that is not limited to a prescribed set of content or outcomes, but is shaped by various factors and forces, including policy, culture, history, and social context." They go on to argue that curriculum is not simply a set of instructional materials or a sequence of lessons, but rather a multifaceted construct that includes a wide range of components, such as content, pedagogy, assessment, and teacher professional development.

The finding supports the study of Seo & Hickman, (2020). In this study, the authors examined the impact of high school mathematics curriculum implementation on student achievement, using a combination of course grades and standardized test scores. They found that the quality of the curriculum materials and implementation was a significant predictor of student achievement, even when controlling for other factors such as teacher proficiency.

Also, the study of Wiseman and Mooney, (2018) "Curriculum Factors Affecting College Readiness", this study examined the relationship between high school curriculum and college readiness, specifically focusing on the impact of Advanced Placement (AP) and International Baccalaureate (IB) courses on students' readiness for college-level work. The authors found that students who took more AP and IB courses were more likely to be prepared for the rigor of college-level coursework

III. Conclusion and Recommendation

The schools 'level of readiness is very high for the school has qualified and trained teachers to teach STEM subjects and the school has access to STEM-related equipment and materials.The level of teachers' proficiency is very high for the school is confident in teachers' ability in analyzing and interpreting data and the school is confident in teachers' ability in engaging in argument from evidence. The STEM students' level of preparedness for higher education is very high. Students' preparedness for higher education can achieve to the extent in which students have explored potential career paths in STEM fields. The higher the schools' level of readiness, the higher the level of teachers' proficiency. The higher the schools' level of readiness, the higher the level of STEM students' preparedness for higher education.The higher the teachers' level of proficiency, the higher the level of STEM students' preparedness for higher education. The independent variable level of schools' readiness along curriculum is the driver of STEM students' preparedness for higher education. Therefore, curriculum should be complex, dynamic, and contested entity that is not limited to a prescribed set of content or outcomes, but is shaped by various actors and forces, including policy, culture, history, social context.

Schools should sustain a rigorous curriculum that prepares students for the demands of higher education. This includes challenging courses in core academic subjects, as well as opportunities for advanced coursework. Schools Administrators should ensure that students have access to the resources they need to succeed, such as textbooks, technology, and academic support services. They should have a regular curriculum review. Teachers need to sustain and have a continuous deep understanding of their subject matter to effectively teach students. It is essential for teachers to keep up with current research and developments in their field. Effective teaching strategies can help students learn more effectively. Teachers should use a variety of teaching methods, such as lecture, group work, and hands-on activities, to cater to different learning styles. Learning pedagogies of teachers should be a student-centered. Teachers need proper trainings on handling and application of different up to date equipment's and apparatus focusing on the study of Chemistry, Physics, and Biology in laboratory activities. Incorporation of recent technologies to ease the applications of theories in the study of Mathematics, Geometry, Statistics, and other related Mathematics subjects. The concept of innovation should be a key word in the process of their learnings.

Teachers should encourage students to explore STEM subjects and activities early on, such as science experiments, coding, robotics, or math puzzles. Teach them to think critically and solve problems by asking open-ended questions and providing opportunities for them to experiment and explore on their own. Plant visits should be included in school activities, because it provides students with real-world exposure to various industries and help them understand the practical aspects of their theoretical learning. Students get to see how things work in reality and how theoretical concepts are applied in practice.Support their interests. Schools Administrators should sustain providing opportunities for STEM teachers for academic growth. They should offer scholastic and self-enrichment opportunities such as workshops on different teaching strategies, seminars, and team buildings. Teachers should retain in fostering a positive learning environment. They should create a positive learning environment that encourages students to ask questions, collaborate with their peers, and engage in classroom discussions. This will help students feel comfortable and confident in their ability to learn. Future researchers may duplicate the investigation considering other variables such as effects of different interventions on student preparedness for higher education over time, compare the effectiveness of different strategies for promoting student preparedness for higher education and the effectiveness of different strategies for promoting student preparedness for higher

Technium Social Sciences Journal
Vol. 44, 145-173, June, 2023
ISSN: 2668-7798
www.techniumscience.com

education in controlled settings. In addition, future researchers may consider different respondents using the same variables, like of teachers' proficiency should be evaluated by administrators and students, students' preparedness should be evaluated by the administrators, and schools' readiness should be evaluated by students.

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