



Study problems of teaching and learning science at primary school level

Mohamed Abo El Ala, Mohamed Taher, Mostafa Ahmed, Youssef Samy, Youssef Walid and Youssef Yousery

Supervisor: Dr/ Enas Saleh Abdel-Baky, Associate Professor of Physiology.

Biological and Geological Sciences Department, Faculty of Education, Ain Shams University, Program of Special Science.

Abstract

This project was designed to determine the problems of science teaching and learning at the primary school level. The current research studies these problems by applying questionnaires on 25 science teachers at different primary schools. The results revealed that there are several problems faced by almost all teachers that affect teaching and learning science at the primary level that cause absence of actual learning and students' restricted progress. The opinion of teachers about the strategies that can be employed to overcome these problems by being an open-minded teacher, flexible, and resourceful to try new and relevant things. Also, it was found that the use of some educational tools and practical experiments can be very valuable in the process of teaching and learning. As they can help students to understand complex concepts and interact with the material in a meaningful way.

Key Words: Problems, Teaching, Learning, Science, Primary level.

1. Introduction:

Science defines the universe by the providing of a truth, essence, and meaning that we live (LaTurner, 2012). Therefore, the education of science helps students understand the world (Harlen, 2006). In addition, it promotes the

skills of problem-solving (Holbrook & Rannikmae, 2007), skills of critical thinking (Harlen, 2006), and the natural world processes appreciation (Mikkonen, 2022).

Learning difficulties are the disturbance that the students face during the process of learning that hinders learning objectives achievement (Winarti, 2021). It is very

important to identify the learning difficulties to find out the problems experienced by students. Thus, the solution of learning difficulties can be found, and the teachers can reduce the occurrence of the same difficulties in the future.

2. The Theoretical Framework

The primary level is the time at which students build an essential science understanding (Garcia, 2003). So, the students are at a critical period at this age in growing their knowledge and their world. The undertaking consequently challenge is to make the education of science at the primary level meaningful, interesting, and useful for students.

A good teacher is vital for the teaching of primary science. However, the primary school teachers may face three problems through the teaching of science: (1) they don't like science (2) they don't feel confident in their science knowledge and (3) they don't teach science effectively (Allen, 2006). So they may give students the impression that science is difficult (Leever, 2010).

Other problems related to the ability of the teacher to select appropriate instruction to suit the needs of students. If teachers do not understand their students' needs, the instructional approaches will be missed (Davis et al, 2006). Hence, the understanding of the problems that teachers face in their science content and their instruction is needed to influence the way in which science is taught at the primary level effectively. Learning and teaching are on opposite sides of the same coin. Therefore, the aim of all teachers should

be not only students learn but master the concepts taught. Teachers are more interested in "what is taught" than "how it is taught" (DiSessa, 2000). If students are not taught appropriately, they will not learn.

Other studies have mentioned that the challenges in learning science, influenced by external and internal factors (Akhmad, 2019). External factors include teacher motivation inadequate, the less optimal times of the day for scheduling of science classes, and the lack of teaching tools using through lessons. These factors impact on comprehension of science concepts and students' motivation. Internal factors include students' lack of interest and their limited attention during lessons (Kallesta et al., 2018).

Because of teachers' responsibilities and the large number of students in the class, teachers are unable to give equal attention to each student (Placito-De Rango, 2017). So, the primary school teachers must find out the optimal methods, times, and places to address the requirements of the science content teaching.

Despite the importance of science, there are many problems facing teachers while teaching science in primary schools and these problems affect students' learning science. So, the aim of the present study was to determine problems of primary school science teachers and suggest ways to overcome these problems.

3. Methods of Research and the tools used

Research Participants

The research participants in this study were twenty five teachers from the Al-Iman language School, Hadayek El-Qobba Administration, New Qobba Private School, Hadayek El-Qobba Administration, Abdel aziz al soad official language school, Sphinx National school, South Giza Administration, Al-Fustat School, South Giza Administration, Sherif Haggag Manna School, Heliopolis Administration, American Chamber of Commerce Official Language School El marg administration and Al wesam Al Munib who taught science subjects at primary schools.

Research Tools

A questionnaire was distributed to twenty five teachers in the english sciences program for the primary stage at the Al-Iman language School, Hadayek El-Qobba Administration, New Qobba Private School, Hadayek El-Qobba Administration, Abdel aziz al soad official language school, Sphinx National school, South Giza Administration, Al-Fustat School, South Giza Administration, Sherif Haggag Manna School, Heliopolis Administration, American Chamber of Commerce Official Language School El marg administration and Al wesam Al Munib who taught science subjects at primary schools and the questionnaire findings were then statistically analyzed. The questionnaire has three axes: agree, moderate and disagree. Microsoft Excel (Office 365) was used to do

statistical analysis, including the means, percentages, T- Test and standard deviations. The graphs were constructed according to the results of the questionnaire.

The questionnaire included two tables:

Table (1) title: The views of science teachers about the problems of teaching science at the primary level.

	Subjects of the discussion	Agree	Moderate	Disagree
1	I am an able to use my time effectively during my science lessons.			
2	Students' science textbook is good source of knowledge.			
3	I can effectively teach science at the primary level.			
4	Large class size.			
5	I need professional development to help me teach science.			
6	Use the narration style, and traditional methods, which do not leave the student's chance to participate.			
7	The lack of devices and modern tools in the school that enable the teacher to change the classroom pattern.			
8	I have insufficient knowledge of science concepts to teach science.			
9	Heavy teaching load.			
10	Lacking technology in science teaching.			
11	Effective use of different teaching methods.			
12	Classroom discipline.			
13	Organization of class work.			
14	Being accepted by students.			
15	Teacher job satisfaction.			
16	Salary and benefits.			
17	Planning lessons and school days.			
18	Relations with administrators.			
19	Relations with colleagues.			
20	Science vocabulary is challenging.			
21	I can relate science concepts to everyday life.			
22	I feel isolated in my program due to the challenges I face (Lacking laboratory materials lack of proficiency with new equipment).			
23	Difficulty in adopting the new curriculum.			
24	Full control by the teacher on the class, when he explains and speaks.			
25	Lacking administrative support.			

Table (2) title: The views of science teachers about the problems of learning science at the primary level.

	Subjects of the discussion	Agree	Moderate	Disagree
1	Student attitudes and perceptions.			
2	Some students have a natural talent for science and others do not.			
3	Determining learning level of students.			
4	Not considering the individual differences between students.			
5	The classroom congestion with students, which leads to a lack of time for everyone to participate.			
6	Indifference to science lessons.			
7	Excessive absences.			
8	Students have negative ideas about science lessons.			
9	Students ignore the teacher instructions, orders and them comments.			
10	Lack of motivation to learn science.			
11	Lack of concern in performance of science activities and homework.			
12	The lack of desire for the students to attend the School.			
13	Sleeping during science lessons			
14	Students reply to the teacher in the impolite manner.			
15	Playing and using mobile phones during science class.			
16	Abuse of other students.			
17	Attempt of cheating during tests or examinations.			
18	Students interrupt others.			
19	Parents are not able to withstand study expenses.			
20	Lack of parental involvement.			

Also, we asked the teachers about the effect of problems on teaching and learning science and the strategies that can be employed to overcome these problems.

The opinion of teachers about the effect of problems on teaching and learning Science

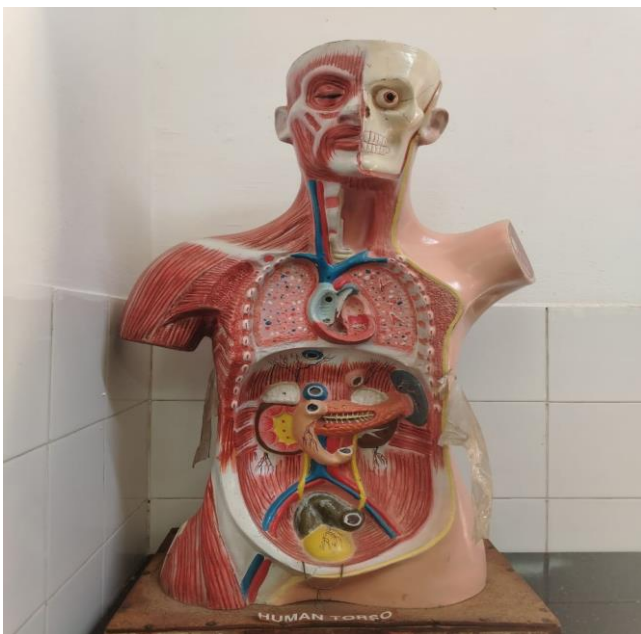
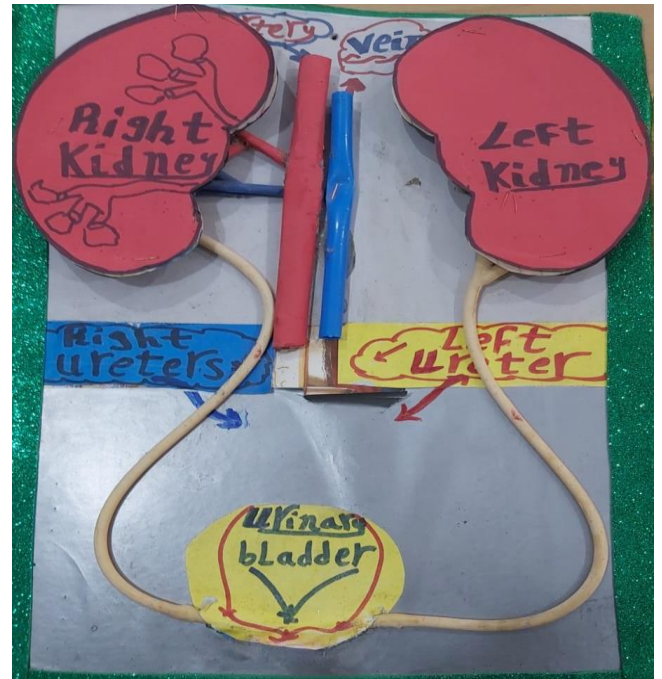
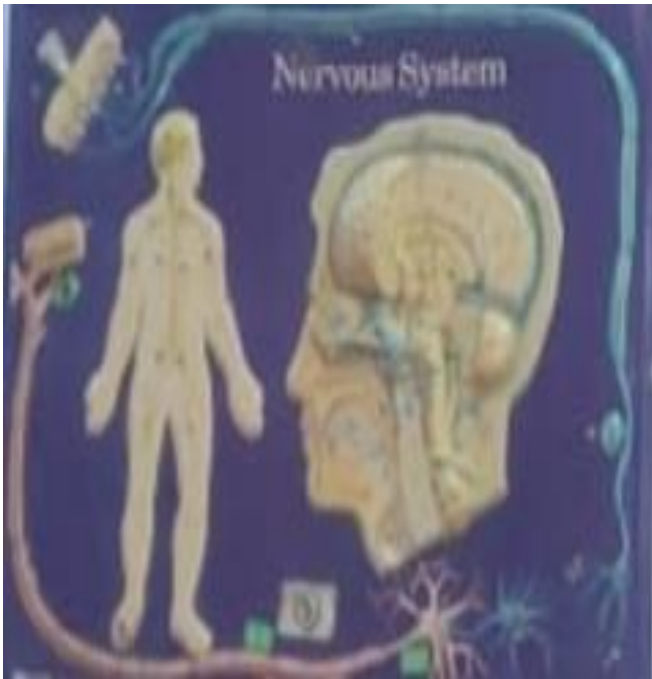
- Science is not adequately recognized or valued by students
- Absence of actual learning and students' restricted progress

The opinion of teachers about the strategies that can be employed to overcome these problems

- Using alternative materials for the experiments
- Being an open-minded teacher, flexible, and resourceful to try new and relevant things

Some educational tools used in teaching of animals, human body systems and chemical reactions to overcome the problems of teaching and learning science in primary schools.





4. Results of Research

The results of the presents study are shown in tables (1&2) and figures (1&2). Table (1) and figure (1) revealed that the responses of teachers on the questions number (2, 4, 6, 8, 9, 10, 12, 13, 14,15, 16, 17 ,18, 19, 20, 21, 22,23, 24 and 25) were agree, the responses of teachers on the questions number (3, 5, 7 and 11) were moderate, whereas the responses of teachers on the question number (11) were disagree.

Table (2) and figure (2) revealed that the responses of teachers on the questions numbers (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14,15, 16, 17, 19 and 20) were agree, the responses of teachers on the questions number (13 and 18) were moderate.

So, the directions of teacher's responses on almost of different items of the questionnaire were agreed.

When we asked the teachers about the effect of problems on teaching and learning Science, the result was 48% the science will not adequately be recognized or valued by students and 52% the absence of actual learning and students' restricted progress.

Also, the opinion of teachers about the strategies that can be employed to overcome these problems was 40% by exploring alternative materials for the experiments and 60% by being an open-minded teacher, flexible, and resourceful to try new and relevant things.

Table (1): Results of teachers' responses.

No. of question	Agree	Moderate	Disagree	Mean	%	T. Test	Standard deviation
1	5	9	11	1.76	58.66	-0.39	3.05
2	15	8	2	2.52	84	0.39	6.5
3	3	16	6	1.88	62.66	-0.08	6.8
4	15	10	5	2.8	93.33	0.8	5
5	11	12	2	2.36	78.66	0.32	5.5
6	13	10	2	2.44	81.33	0.38	5.68
7	8	14	3	2.2	73.33	0.18	5.5
8	15	3	7	2.32	77.33	0.26	6.11
9	19	0	6	2.52	84	0.26	9.71
10	19	5	1	2.72	90.66	0.38	9.45
11	9	13	3	2.24	74.66	0.23	5.03
12	18	5	2	2.64	88	0.37	8.5
13	20	0	5	2.6	86.66	0.28	10.4
14	22	0	3	2.76	92	0.31	11.93
15	13	5	7	2.24	74.66	0.28	4.16
16	15	6	4	2.44	81.33	0.37	5.85
17	21	3	1	2.8	93.33	0.36	11.01
18	19	2	4	2.6	86.66	0.32	9.29
19	21	1	3	2.72	90.66	0.32	11.01
20	16	5	4	2.48	82.66	0.36	6.65
21	19	1	5	2.56	85.33	0.29	9.45
22	19	2	4	2.6	86.66	0.32	9.29
23	15	6	4	2.44	81.33	0.37	5.85
24	20	0	5	2.6	86.66	0.28	10.4
25	20	0	5	2.6	86.66	0.28	10.4

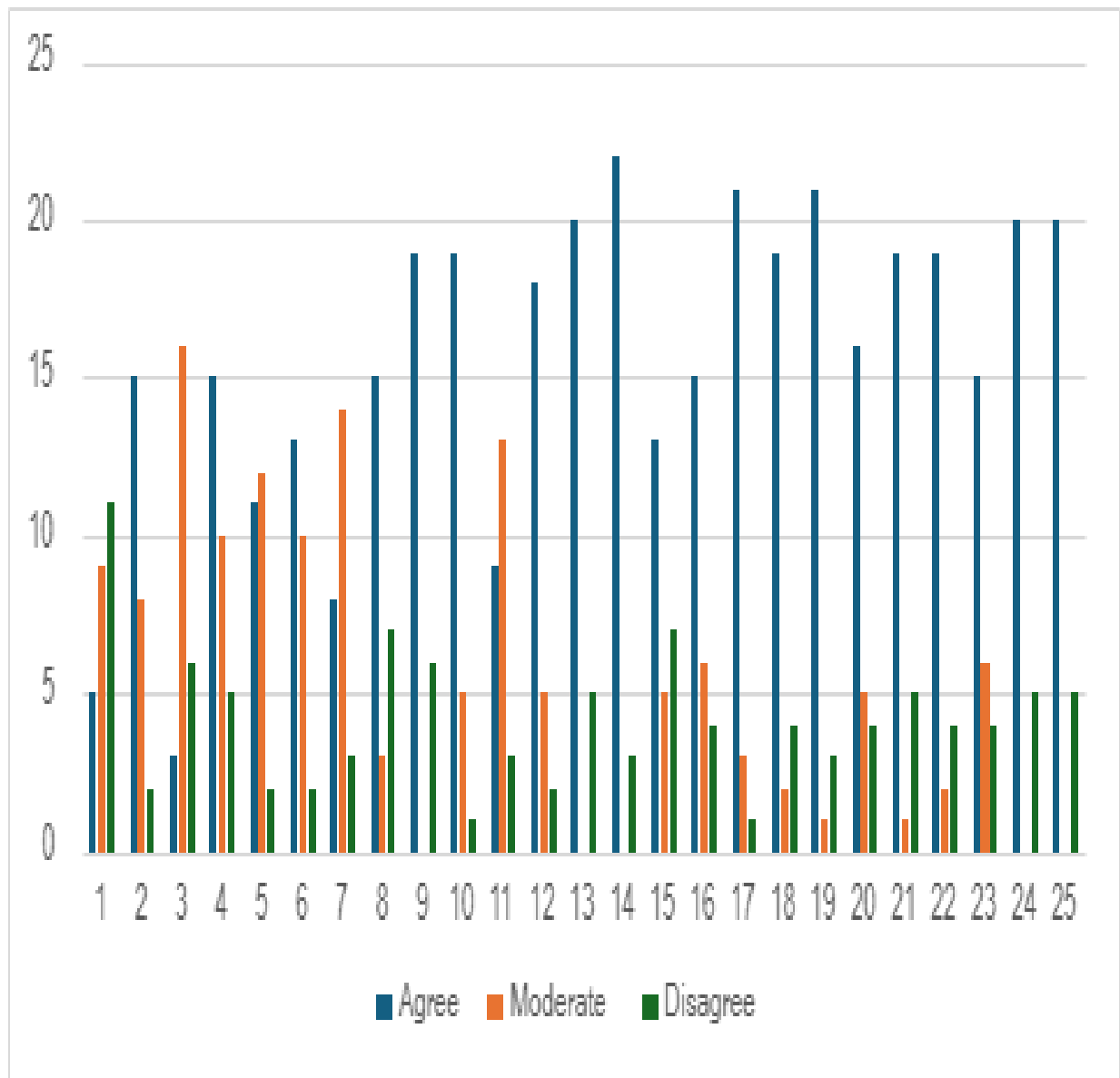


Figure (1): Histogram showing the relation between the questionnaire items in table (1) and teachers' responses.

Table 2: Results of teacher's Responses.

No. of question	Agree	Moderate	Disagree	Mean	%	T. Test	Standard deviation
1	19	5	1	2.72	90.66	0.38	9.45
2	21	3	1	2.8	93.33	0.36	11.01
3	22	3	0	2.88	96	0.36	11.93
4	14	7	4	2.4	80	0.38	5.13
5	17	8	0	2.68	89.33	0.39	8.5
6	20	4	1	2.76	92	0.37	10.21
7	16	5	4	2.48	82.66	0.36	6.65
8	16	7	2	2.56	85.33	0.39	7.09
9	10	8	7	2.12	70.66	0.39	1.52
10	17	5	3	2.56	85.33	0.36	7.57
11	19	4	2	2.68	89.33	0.36	9.29
12	14	6	5	2.36	78.66	0.36	4.93
13	4	11	10	1.76	58.66	-0.31	3.78
14	14	6	5	2.36	78.66	0.36	4.93
15	11	6	8	2.12	70.66	0.23	2.51
16	15	6	4	2.44	81.33	0.37	5.85
17	20	2	3	2.68	89.33	0.33	10.11
18	9	10	6	2.12	70.66	0.28	2.08
19	16	3	6	2.4	80	0.29	6.8
20	19	6	4	2.92	97.33	0.56	8.14

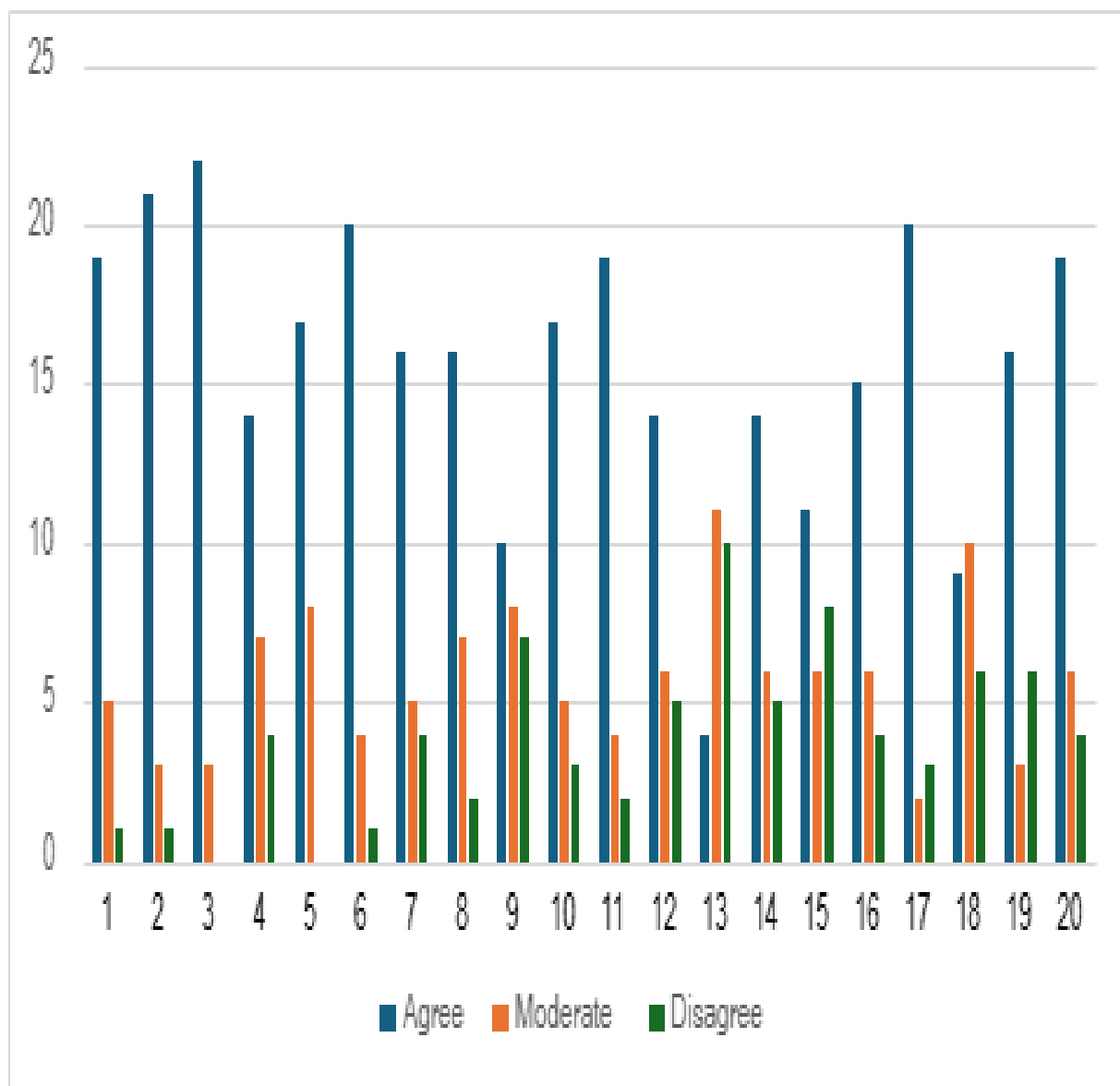


Figure (2): Histogram showing the relation between the questionnaire items in table (2) and teachers' responses

When we used some educational tools during teaching of science at primary school, we observed that it helps the students to understand the topics easily and increase their attention during the explanation in the classroom compared with the traditional method of teaching.





5. Interpretation of Results

Science education is integral to the primary school curriculum (Hurd, 2000). Science has made several contributions to the development of the world, including developing vaccines and treatments and enabling global communication and information access (Angeles et al., 2023). However, despite its importance, teaching science in primary schools is challenging.

We concluded from teacher's responses on the questionnaire items that most teachers views about the problems of teaching science at the primary level including inability to use the time effectively during science lessons, large class size, needing for professional development to teach science, using the narration style, and traditional methods, which do not leave the student's chance to participate, having insufficient knowledge of science concepts to teach science, heavy teaching load, lacking technology in science teaching, classroom discipline, organization of class work, being accepted by students, teacher job satisfaction, salary and benefits, planning lessons and school days, relations with administrators, relations with colleagues, science vocabulary challenging, lacking laboratory materials and lack of proficiency with new equipment and difficulty in adopting the new curriculum and lacking administrative support.

Also, the responses of teachers about the questionnaire items showed that most teachers views about the problems of learning science at the primary level may be due to

student attitudes and perceptions, some students have a natural talent for science and others do not, determining the learning level of students, not considering the individual differences between students, the classroom congestion with students, which leads to a lack of time for everyone to participate, indifference to science lessons, excessive absences, students have negative ideas about science lessons, students ignore the teacher instructions, orders and them comments, lack of motivation to learn science, lack of concern in performance of science activities and homework, lack of desire for the students to attend the school, sleeping during science lessons, students reply to the teacher in the impolite manner, playing and using mobile phones during science class, abuse of other students, attempt of cheating during tests or examinations, students interrupt others, parents are not able to withstand study expenses and lack of parental involvement.

The results indicate that the problems of teaching and learning science at the primary level are common between almost all teachers. These results agree with Kotsis (2024) who reported that various obstacles hinder effective science education in primary schools, including a lack of time and resources, inadequate teacher preparation and support, and negative student attitudes and perceptions. Also, A lack of instructional tools, and a misunderstanding of the language all contributed to conceptual difficulties in comprehension (Akram et al, 2014). In addition, the relations with administrators

and colleagues can affect collaboration and teamwork. The most crucial factors for the effectiveness of teachers the support from the administration and the team effectiveness (Conley & You, 2017). Large classrooms can hinder student participation, as teachers may not have enough time or resources to provide individualized attention to each student. Bai and Chang (2016) found that students in larger classrooms had lower levels of classroom participation compared to those in smaller ones. In addition, Lyons (2006), reported that students often disengage from science due to its perceived difficulty, and ineffective teaching methods.

The classroom behavioural issues, including ignoring instructions, using mobile phones during class, and lack of participation, create additional barriers to learning. According to Finn et al. (1995), student engagement is a strong predictor of academic success, and behavioural issues significantly hinder learning. External factors such as lack of parental involvement and financial constraints also negatively impact students' ability to engage in science education. The results obtained by Epstein (2001) suggested that strong parental involvement improves student motivation and academic performance.

The using of some educational tools during teaching of science at the classroom to overcome the problems of teaching and learning of science were more effective on the students comparing with using the traditional

methods only, as we observed that it helps the students to understand the topics easily and increase their attention during the explanation by the teacher in the classroom comparing with the traditional method of teaching. These results are in agreement with Huddle et al. (2000), who stated that the models can make the scientific concepts and the ideas more understandable to learners. Also, De Jong (2006) stated that simulations, models, and interactive experiments enhance students' conceptual understanding of science.

Based on the results of the present study, we suggest several strategies that may help in overcome the problems of teaching and learning science at the primary level, including:

- Laboratories should be set up or re-organized for effective science teaching in primary schools.
- Science teachers should use alternative assessment methods.
- Using low-cost laboratory equipment and materials.
- Providing professional opportunities for teachers to enhance their knowledge and skills in science teaching.
- Technology, such as virtual and augmented reality, enhances science instruction.

6. Conclusion

The data gathered from this study revealed that there are many problems that affect the

teaching and learning of science at the primary level. These problems deal with the teachers and students. It is important to use different strategies to overcome these problems and improve science education at the primary level such as increasing time and resources for science education, enhancing teacher preparation and support, and promoting positive student attitudes and perceptions toward science. By implementing these strategies, primary school teachers can create a learning environment that supports student learning and promotes student engagement in science.

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different educational tools at the classroom that facilitate the teaching of curriculum.

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