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QSTEM kit: The Secrets of the Ocean in Al Quran

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Abstract : There are many places in Al Quran that integrates the knowledge of science. Thus, it has been used as references for many researches nowadays. As the interest of learning science in Al Quran arises, it is essential to develop a STEM kit teaching tool in touting science and Al Quran to younger generations. This product is known as QSTEM kit: The secrets of the ocean in Al Quran, focusing on the verse specified in Al Quran on ocean. The activities in this kit includes floating eggs, invisible ink and salt density. These interactive activities instill the fun-learning approach in understanding the concept of density. This product will help the teachers to teach their students about the relationship between science and Al Quran especially about salt in the ocean and the concept of density. A preliminary survey was conducted and positive feedback has been observed from teachers and students on this kit. Further development is required to improve the kit for commercialization. There is a demand for an Islamic integrated stem kit in order to prepare a resilient future generation that will be well-equipped, both academically and spiritually.

Keywords: QSTEM Kit, Teaching Tool, STEM Education, Quran

1. Introduction

The Quranic-embedded STEM education will expose the students with the understanding of Quran verses through STEM activities. As the interest of learning science in Al-Quran arises, it is essential to develop a QSTEM kit as a teaching tools in promoting science and Al-Quran to younger generations.

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The product is known as QSTEM kit: The secrets of the ocean in Al Quran. To effectively learn science, students need to learn more than just facts and theories [1]**.** Rather, they need to construct their understanding through an iterative, collaborative process that builds and reshapes prior knowledge.

This paper aims to evaluate users (teachers and students) perception towards the integration of Quran verses understanding into science teaching and learning in term of their motivation and process develop the Q-Stem Kit that will help the teachers to teach their student about the relationship between science and Al-Quran especially about salt in the ocean and define the concept of density.

2. Materials and Methods

The current Q-STEM Kit is developed with the knowledge of the aforementioned Quran verses, and also the materials needed to carry out activities with the students in the classroom. There are three activities provided within the kit. The first one is The Floating Egg, where the students can do activities related to density and how it is influenced by the salty water. The second activity within the kit is the Invisible Ink, which utilises the element of 'growing crystals' allowing hidden letters to visibly appear as shades of colour are applied on the dried salt water. The last activity in the kit would be The Salt Density, with a simple activity that would teach the students about the difference of density in liquid hence applying that knowledge to explain the separation of the sea water and the fresh water. The content of this kit and its activities were carried out and recorded in a video presentation as the tool of research.

This study employed a quantitative approach where the utilisation of a pre-recorded video of the Q-STEM Kit simulation with duration of 5 minutes is implemented to elicit evaluation from respondents, and the evaluation from the video is evaluated using an instrument developed by the researchers. The instrument of this study is a series of questionnaire adapted and developed from several previous researchers from similar background of study [1 - 4] which consists of the demography, pre-evaluation and post-evaluation sections. The questionnaire was disseminated via the online platform of Google Form. The respondents of this study were recruited using the purposive sampling technique which allows researchers to select participants who could meet the objective of the study. A total of 88 respondents from various backgrounds took part in this study. The data obtained was then analysed using descriptive statistics to provide more insight and explanation.

3. Results and Discussion

There were 88 respondents who took part in completing the questionnaire. Out of the 88 respondents, 73.9% were female, while the other 26.1% were male. While the majority of the respondents (66%) were students of different school background (52% from secondary schools; 20% from tahfiz schools; 19% from private schools; 9% others), the other 34% of the respondents are educators from various background of affiliations. The results of this study were explained further in the following sections.

3.1 Teachers and Students' Perception Towards the Q-STEM Kit's Effectiveness in the Teaching and Learning Process of Science

From the data collected through the survey, it was found that majority of the respondents have positive feedback towards the Q-STEM Kit in terms of its effectiveness in the teaching and learning process of science. Based on data collection, it can be said that majority of the respondents agreed that the Q-STEM Kit is suitable with the present science syllabus. This is reflected from the feedback by 52.3% of the respondents who expressed their strong agreement with the statement, plus the other 34% of the respondents who agreed. On the other hand, 12.5% of the respondents remained neutral, and only 1.1% of the respondents did not find the kit suitable. This shows that the current Q-STEM Kit is in line with the latest science syllabus provided by the Ministry of Education (MOE), even when it is integrated with the elements of Quran verses understanding. It is important to make sure the learning kit developed

follows and adapts to the syllabus that has been outlined so that the learning process does not deflect from the syllabus of learning laid out by the MOE [5].

The next item posed a question on whether the respondents find the kit attractive. It was found that majority of the respondents (54.5%) strongly find the kit attractive, while the other 35.2% of the respondents agreed that the kit is attractive. 9,1% remained neutral, and only 1.1% of the respondents disagreed with the statement. This may support the result obtained from the previous item, as engagement in the learning process may also be strongly driven by the attractiveness of the learning module or games. A study in 2014 which investigated on the features of learning kits that motivate students' learning also proposed in their study that there is a relationship between attractive learning kit/module and students' learning effects [6].

Aside from the two 5-point Likert scale questions, the respondents were also required to answer two open-ended questions. The first one obtained their feedback on *what their impression is on the Q-STEM Kit*. Majority responded positively as they expressed their interest and satisfaction with the learning kit. Some of the responses displayed their agreement in how the Q-STEM Kit would be helpful in learning science, while simultaneously being able to understand more of the verses of Quran. One respondent particularly expressed that '*it would be helpful to help us realize the importance of science and Al-quran in our life*.' Another respondent provided a related response as they commented, '*this is very good for students to imbibe on more knowledge and to do the tadabbur of the Quran*.' From these responses, we could see their relation to the possibility for this Q-STEM Kit to be capable of making learning science interesting. This is supported by other response which claimed that this kit is '*interesting as it relates with information from Al Quran*.' Not only that, most of the other responses stated that this kit is '*easy to understand*' and that it is '*a good initiative for beginner to understand science and religion*.' Based on these responses, it could be deducted that this Q-STEM Kit managed to be attractive and capable enough to be utilised in the class for the teaching and learning process.

Despite the positive feedback, there would definitely be some suggestions for improvement. The second open-ended question invited the respondents' suggestion for the Q-STEM Kit's improvement. Majority of the responses suggested that the kit includes more interesting experiments/activities like '*include experiments aside from the salt in the sea water*' and to do the experiment '*at the seaside by using sea water as sample*.' Several responses have particularly suggested for the kit to contain scientific apparatus '*to attract kids to do the activity*' while one respondent specifically suggested that the Q-STEM Kit to '*provide more hadith and example from Al-Quran on scientific findings*.' Besides suggestions on the number of experiments and the materials in the kit, another response expressed that the kit needs to be '*more challenging to enhance the students' mind*.' This shows that while this Q-STEM Kit has garnered positive feedback, there is still room for improvement.

4. Conclusion

This study has demonstrated the potential of quranic-embedded STEM kit as a STEM learning tool. Based on the conducted survey, it has been suggested that this Q-STEM kit is well-received by both students and teachers as the kit suits the present science syllabus while the integration of Al-Quran develop the balanced characteristics of a learners spiritually as well as academically. The kit was able to increase students' interest in learning science while most of them find it attractive and engaging.

Further study should be conducted in practical in order to assess the compatibility and effectiveness of hands-on activities by using the kit. A larger sample is required for future study in order to measure its suitability across various background of students and locality. Nevertheless, this preliminary study provided a positive indication with big prospect for commercialization in the future.

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