SMART Measuring Device: Utility Model for School Laboratories

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Abstract
This utility model helped to addressed the challenges in the insufficiency of laboratory apparatus in schools and improved the quality teaching of science curriculum through technology-aided device. There are thirty-nine (39) respondents consist of thirty (30) students, six (6) teachers and three (3) random engineers served as respondents of the study. Data were gathered through the use of researcher-made validated questionnaire comprised of (I) Checklist to test the content and instructional and technical quality and (II) open-ended questions to be answered by the students for their experiences while using the utility model. The statistic tools used were mean and standard deviation for descriptive statistics. Experiences of students were analyzed and synthesized in a thematic analysis. Results revealed that the present status of supply and devices in science laboratories were all inadequate or less equipped. Also, the developed utility model for school laboratory was "very acceptable" in terms of content and instructional and technical quality. Furthermore, the experiences of the students focused on how the utility model was used during the conduct of the activity. It measures the volume, weight and density properly and accurately, and in an interesting, very convenient, efficient, and specific manner. In which, positive feedbacks on the experiences of the students in using SMART Measuring Device was met.

Keywords: Utility Model, SMART Measuring Device, Very Acceptable, Laboratory, Experiences

Introduction

Laboratory is the heart of science in which the individual could put theory into practice (De Borja et. al, 2020). It is believed that the laboratory is an important means of instruction in science since late in 19th century to present as it helps to increase the level of understanding (Townsend, 2012).

The use of the laboratory helps to develop scientific attitudes of the students towards the learning of subject matter especially practical concepts that develop scientific skills for problem solving (Omiko, 2015). Duit and Tesch (2010) in their study said the experiment plays a truly significant role in science instruction as they believed that hands-on needs to include minds-on. Which means that not all experiments including those that are beautifully designed result in the outcomes that are expected, and it should need to be staged adequately in such a way that hands-on and minds-on must occur.

Science laboratory experiments and laboratory experiment aid in developing scientific learning amongst student and in cultivating deeper and profound interest (De Borja et. al., 2020).

The K-12 Curriculum in the Philippines focuses on the "learning by doing" as a practical discipline that is an inquiry approach, which also requires hands-on, as well as minds-on, and hearts-on activities that feature the importance of active learning of the students. Aligned with the goal of the curriculum, the science curriculum is a learner-centered and inquiry-based discipline that provides learners with competencies necessary in the society and the work field. It requires learners to engage directly with materials needed for understanding the scientific concepts and for developing their scientific skills (Abas et. al., 2020).

However, teaching science needs to be addressed as many public schools in the country are challenged by the lack or insufficient of science laboratory facilities and equipment, including learning materials which are adhered and proven from the literature of this study. With this, some science teachers may resort to skipping or even not having the teaching with Higher Order Thinking Skills also known as HOTS on some laboratory activities if improvising materials are not possible. Hence, it hinders the realization of some competencies needed by the learners.

The inadequacy of laboratory facilities and equipment and insufficient laboratory rooms which are conducive for the teaching-learning process hinders the effective teaching strategies of the teacher (Masbaño, 2016). There is an indeed lesser focus when it comes to Science laboratory. Issues arose as an inadequate number of laboratory rooms as against the number of students, lack of materials, enough training of Science teachers in this venture, and most especially, safety, readiness and resilience of schools during laboratory experiments accidents (De Borja et. al 2020).

To address the present concern, technologies started to emerge successfully which enhances the learning and teaching process that supports science education through interactive learning environment that enables the students to participate and learn (Alijuhani, 2018).

With the statements aforementioned above, the development of utility model for laboratory activities known as SMART Measuring Device would help to address the challenges in the insufficiency of laboratory apparatus in school and improve the quality teaching in science curriculum through technology-aided device.

The SMART Measuring Device is a one-of-a-kind utility model that can do the function and task of graduated cylinder, Erlenmeyer flask, beaker and balance which makes the learning more interesting, fun, aligns to modernization and high-technology, as well as helps in the conduct of science laboratory experiments in a short period of time.

This study aimed to develop a utility model to enhance the learning performance of the Basic Education (BEd) students and it specifically sought to answer the following questions below:

1. What is the present status of science laboratories in secondary schools, particularly on the availability of materials, supplies and device?
2. What are the features from prior arts on measuring devices for liquids that can be used as basis for innovations?
3. What innovative smart measuring device can be developed?
4. How acceptable is SMART Measuring Device: Utility Model for School Laboratories as evaluated by Teachers, Engineers and Students?
5. What are the experiences of the students in using the SMART Measuring Device?

Purpose of the Study and Research Design

The Input-Process-Output (IPO) was used in the study. It aims to have an output through a process with the use of the utility model that answers the statement of the problem. Furthermore, the acceptability of the utility model fills in the gaps between the teaching-learning process and the inadequacy/unavailability of laboratory apparatuses in school.

The respondents performed laboratory activities using the utility model. The acceptability of the SMART Measuring Device was divided into (I) Content and (II) Instructional and Technical Quality. The SMART Measuring Device substitutes the unavailability of laboratory apparatuses that could measure the mass and volume of common materials (i.e. water, dishwashing liquid, isopropyl alcohol and mineral oil) needed in laboratory activities.

The respondents of the study were randomly selected and instructed to perform laboratory activities with the use of SMART Measuring Device. According to Cherry (2021), the term “random sample” is a subset of individuals randomly selected by researchers to represent an entire group as a whole. The goal is to get a sample people that is representative of the larger population.

Methods

This section explains the methodology utilized in this study. This includes the respondents, research instruments, data collection procedures and data analysis procedure.

Respondents

The acceptability of the SMART Measuring Device as utility model for school laboratories was based on the evaluated data of the learners, teachers and engineers.

Students

The randomly selected thirty (30) students from the Kalibo Institute Inc.- Senior High School Department determined the acceptability of the utility model as it was used during the laboratory activities. They answered the checklist and the interview questions in a researcher-made instrument. The only requirement of the respondents was they had a science subject on the said school.

Teachers

The Teachers being referred to in this study were the six (6) teachers who are teaching in Kalibo Institute Inc. The teachers' teaching experience and educational attainment did not affect the study. They answered the checklist that was already prepared by the researcher and was previously validated.

Engineers

Three (3) engineers evaluated the acceptability as well as the development of the utility model. These engineer experts are electronic engineers and have finished their 5 (five) year course. The school that they last attended and their attainment of the electronic engineers' licensure examination did not affect the study. These people answered the validated checklist in the researcher-made instrument.

Instrumentation

SMART Measuring Device was used as the main laboratory apparatus during the laboratory activity of the respondents. A researcher-made instrument was used to validate the acceptability of the utility model. The instrument was consisted of thirteen (13) item test. The validated test items were categorized into content (1-5), instructional and technical quality (6-10) and three (3) sets of interview questions answered by the students only.

The checklist and interview part was validated by a panel of experts to assure the quality of the data gathered by the researcher. The researcher-made instrument was comprised of:

Checklist

Part I contained the personal background information of the respondents such as the respondents' age, gender, and where they had their last school attended. Part II Content and Part III Instructional and Technical Quality were composed of 15 statements that measured the acceptability of the content and the instructional and technical quality of the utility model. In order to obtain the level of acceptability of the utility model, each statement has its scale which has an equivalent numerical value corresponding to the responses.

The Scale Indicators Scale was scored as follows:

Raw Score	Description
1	Not Acceptable
2	Fairly Acceptable
3	Moderately Acceptable
4	Acceptable
5	Very Acceptable

Mean scores and responses were analyzed and interpreted as follows: on the analysis, mean and standard deviation were used. The mean score determined the level of acceptability (Very Acceptable, Acceptable, Moderately Acceptable, Fairly Acceptable and Not) and the standard deviation was used to describe the variability from the mean. The said evaluation form assessed the acceptability of the utility model of the SMART Measuring Device for school Laboratories.

Table 1: Ranges for Interpretation

Lower Bound	Upper Bound	Interpretation
1.00	1.80	Not Acceptable
1.81	2.60	Fairly Acceptable
2.61	3.40	Moderately Acceptable
3.41	4.20	Acceptable
4.21	5.00	Very Acceptable

The table shows the range scale used in interpreting the responses of the respondents in order to determine the acceptability of the SMART Measuring Device.

Interview Guide

The interview guide used in this study was composed of three (3) open-ended questions answered by the students only. It helped the researcher to determine the experiences of the students while using the SMART Measuring Device in the laboratory experiments.

Data Gathering Procedure

The researcher wrote a letter of request addressed to the principal of Kalibo Institute Inc. – Senior High School Department to allow her to conduct/administer the study in the said school. The researcher, through the assistance of the head of the Senior High School Department gathered the respondents in a room for implementation. Instructions were read carefully to the students and teachers to make them understand what they are going to do.

The researcher explained and guided the respondents on how to perform the laboratory activities using the utility model. The students and teachers performed three (3) laboratory activities using the SMART Measuring Device. These include: Activity 1 – Exogenic Process, Activity 2 – Solutions and Activity 3 – Banana DNA.

Furthermore, the researcher administered the utility model to the students and teachers who were there the entire conduct of the study. The data collected were processed and analyzed by the use of SPSS (Statistical Package for Social Sciences) software.

Analysis Phase

In science subject, laboratory apparatuses are important. There are studies that give insight to the shortage and lack of laboratory apparatuses. Hence, here are some of the verifications about it.

De Borja (2020) strongly suggests that the government should support the funding of Science laboratories and at the same time decrease class size for the students to reach optimum development of learning as they believe that science experiments will help students to have better retention and appreciation of the science concepts.

The inadequate number of functional laboratories and apparatus taught the teachers how to improvise on certain laboratory materials as well as help the schools to discover ways of improvising the laboratory equipment from local and available materials in order to achieve learnings in the classroom. The Province of Northern Iloilo Polytechnic State College (NIPSC), a model school in implementing STEM curriculum in the district faces a problem on unavailability of the laboratory materials for hands-on activities and limited science textbooks to conduct the lesson (Tupas, 2019).

The status of laboratory materials in NIPSC resulted in the study of Delos Santos (2021) which states that the low mastery of science competencies is caused by lack of hands-on activities due to inadequate laboratory apparatus and absence of functional laboratory rooms.

The School 1 in Kalibo, Aklan, School 2 in 2nd Congressional District and School 3 in 1st Congressional District both from Iloilo Province currently have concerns on laboratory apparatuses to be used during hands-on activities. The present apparatuses were not functional and less in number considering the population of students during the conduct of science activities. These lead the teachers not to demonstrate the activity in class which in turn hinders the teaching-learning process. With the data gathered from three different schools, it was found out that all laboratory apparatuses are "less equipped" which means that it is less in number and the worst case was its not functional.

Having the concerns mentioned, there were prior arts that are already present today that serve as the strong basis of the researcher for the development and innovation of the SMART Measuring Device as a utility model for school laboratories.

The first one is Method of Determining Viscosity and Density of Liquid and Apparatus by Antonovich (2015). This looks into the continuous measurement of viscosity of a liquid during a process directly on an apparatus, for liquid where viscosity varies time over a wide range, including high-viscosity liquid.

Next is Measuring Device, Bisector Vernier Caliper by Alshamali Ismael (2021). This is about a mechanical measuring device that demonstrates its importance in industrial workshops and other engineering venues. It has also been developed into one of the most important mechanical measurement devices in an industrial workshop. The main result of this study was merging traditional Vernier Caliper which could solve technical problems in a workshop and save time, money and effort.

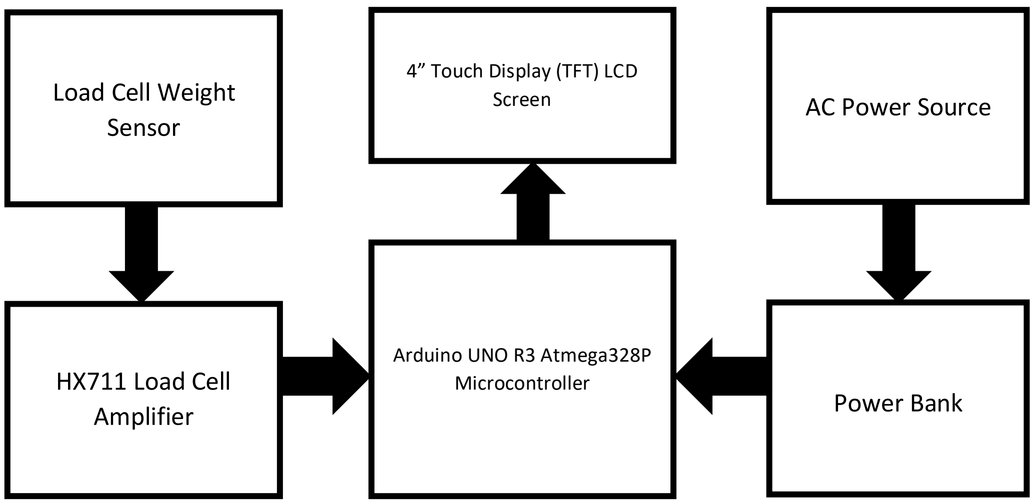
Finally is the Smart Fluid Measurement Device by Muhib Ali (2019). He presented a paper that provides the design and development of Smart Fluid Measuring Device for indicating the amount of liquid dispensed through a liquid dispenser where the system helps to avoid fuel corruption at fuel pumps by estimating the correct amount of the liquid that has been dispensed.

Design Phase

The main objective in designing the utility model was to be used as measuring device for school laboratories that may fill-in the gaps between the learning environment and the teaching-learning process. It is a fact that measuring devices are important in the conduct of laboratory activities inside the science laboratories.

During the designing phase of the utility model, there were things that were put into consideration to have a very acceptable laboratory apparatus to be used in school laboratories.

The size of the model was one of the primary considerations. The researcher wanted to design a handy laboratory apparatus and with a 3-dimensional feature to tilt the screen for easy reading of data. The capacity of the load cell and the power source were also considered to have alternative options in case there is no commercial power source to be used. The components used during the designing of the utility were also made sure to be in good quality and should be functional in order to come up with an excellent output. To illustrate how the components are connected with each other as a whole functional system, a block diagram serves as an illustration and a description of how it works.



The usage of the device starts by switching on the power. The screen will display two (2) options to select, whether the user will measure the weight or volume of the substance. In measuring the weight, click the “Weight” option. Place the container on the platform then click the “Tare” option, so that it will not include the weight of the container. Add the solid substance to be measured and the screen will display the value.

For the volume option, the steps are similar on how to measure the weight. Click the “Volume” option and it will displace four (4) types of liquid substances. The device was programmed to measure four (4) different types of liquid substances. This was based on the commonly used liquid substances in the school laboratory. Just select the substance to be measured.

Development Phase

Development Phase were consisted of five (5) stages:

I. Collaboration of researcher with the electrical engineer experts in preparations of making the Container, Liquid Substance and Command from the User and in creating a program for the microcontroller to operate the micro load cell.
II. Generating the program for the microcontroller to receive the input from the user using the touchscreen (LCD Screen).
III. Creating a program for the microcontroller to display the info on the touch screen.
IV. Programming that will convert the density of the liquid being measured.
V. Testing the functionality of the system. Once ready to be used as utility model, the next step of the researcher is to test the functionality of the system by using it in the laboratory activities. This were answered by the Teachers, Engineers and Students through a prepared and validated researcher- made instrument.

The utility device was calibrated to ensure the accuracy as to function (process) and data (output) prior to the day of the implementation and conduct of the study.

Implementation Phase

The utility model was used in three (3) different laboratory activities conducted by the researcher and respondents in a face to face set-up following the health protocols. The table below shows the laboratory activities conducted with the use of the utility model.

Table 2: How Utility Model Replaced the Insufficiency of Laboratory Apparatus During the Conduct of Activities

Activity Title	Laboratory Apparatus Replaced by the Utility Model	Qty.	Function of the Utility Model
Activity 1: Exogenic Process (Earth and Life Science)	Beakers	3-6 pcs.	Used to measure the amount of water
	Weighing Scale	1 unit	Measures the accurate weight of sand (100 grams), agricultural soil (100 grams) and clay (100 grams)
Activity 2: Solutions	Beakers	6-9 pcs.	Measures the amount of water (100ml)
	Weighing Scale	1 unit	Used to measure the right weight of salt (NaCl) (15 grams, 30 grams, 60 grams
Activity 3: DNA	Graduated Cylinder	2-3 pcs.	Measures the dishwashing liquid (20ml) and alcohol (10ml)
	Beaker	2 pcs	Measures the right amount of water (120ml)
	Weighing Scale	1 unit	Measures the right amount or right weight of salt (20 grams)

The insufficiency of laboratory apparatus was taken into consideration in order to use the utility model in the different science laboratory activities.

The acceptability checklist in the researcher-made instrument was also accomplished by the respondents. Moreover, the interview questions were only answered by the respondents for the researcher to obtain their experience while using the utility model. Their evaluation were incorporated in the final draft of the instrument.

Simulation Phase

The utility model of the researcher and engineers was tested if it is functional. As the researcher-made laboratory activities met the science objectives from the curriculum guide of DepEd, the respondents used the utility model on the laboratory experiment. The research respondents were the following: Engineers, Teachers and Students. Then, the researcher-made checklist was given to the respondents to answer. After which, the accomplished laboratory activity sheets were collected and recorded. An interview on the thirty (30) students about their experiences on the utility model while using it on the given laboratory activity was done by the researcher. The responses that were gathered involves collecting and analyzing non-numerical data to understand concepts, opinions, or experience of the users who were using the utility model.

Statistical Data Analysis Procedure

The data gathered for the study were subjected to computer-processed descriptive, using SPSS (Statistical Package for Social Sciences) software.

Mean --was used to obtain the mean scores to describe the respondents’ response on the effectiveness of the device that had been used on the laboratory activities.

Standard deviation --was used to determine the homogeneity and heterogeneity of respondents’ insights on the acceptability of the device on the laboratory activities.

Conclusion

The findings of the present study revealed that:

1. The present status of science laboratories in secondary schools, particularly on availability of materials, supplies and devices are inadequate and less equipped which leads to the difficulty on teaching science laboratory lessons.
2. There were prior arts that served as the basis of the researcher for the innovation of the SMART Measuring Device as a utility model for school laboratories. These are beaker, watch glass, graduated cylinder, weighing scale and Erlenmeyer flask. Also, some existing studies which include the Smart Fluid Measurement Device, Measuring Device, Bisector Vernier Caliper, and Method of Determining Viscosity and Density of Liquid and Apparatus were taken into consideration and were used as reliable sources.
3. The innovative SMART Measuring Device that the researcher developed achieved the positive feedback on the developed utility model after using it on the sample laboratory experiments. To highlight, there were five (5) stages in the development phase of SMART Measuring Device: Utility Model for School Laboratories and these are the following:

I. Collaboration of the researcher with the electronic engineer experts in preparations of making the container, liquid substance and command from the user and in creating a program for the microcontroller to operate the micro load cell.
II. Generating the program for the microcontroller to receive the input from the user using the keypad.
III. Creating a program for the microcontroller to display the info on the LCD screen.
IV. Programming that will convert the density of the liquid being measured.
V. Testing the functionality of the system. Once ready to be used as utility model after the study achieved having it, the next step of the researcher is to test the functionality of the system by using it in the laboratory activities. These were answered by the teachers, engineers and students that through a prepared and validated researcher- made instrument.

4. The SMART Measuring Device: Utility Model for Laboratories was evaluated by Teachers, Engineers and Students and was found out to be very acceptable as it is the result when the said utility model was used in the laboratory activities.
5. A thematic analysis that sum-ups the positive feedbacks on the experiences of the students in using the SMART Measuring Device was met. These are: Measuring volume and weight properly and accurately, interesting, very convenient, efficient, exciting, specific, applicable to school laboratory, very high-technology, gaining more knowledge and wisdom, unique, accurate and can influence other learners to learn.

Implications

The findings of the present study have led to certain implications for theoretical and practical concepts for the SMART Measuring Device: Utility Model for School Laboratories.

For Theoretical

The findings revealed in this study was anchored and supported by the Input-Process-Output (IPO) and Independent Learning Theory. In the development and usability of the utility model, the Input-Process-Output (IPO) model was used as it is a functional graph that identifies the inputs, outputs and required processing tasks needed to transfer input into output. As the study used an IPO model, the researcher added the prior arts for the input that were also related to the study. On the process, it includes the design and development of the utility model as well as the implementation and the evaluation. Finally, the output is known to be the SMART Measuring Device. Through this, the independent learning theory as a self-directed learning that an individual can choose what they want to learn, how deeply they wish to learn about something and methods or processes involved learning, EveWebb (2021) became part of the study.

For Practical

This is applicable for school administrators, science educators, students who are having science subjects and laboratory personnel. There is an importance of using labs/activities because it inspires and increases understanding of science that was evident not only in survey results but from statements students made as well (Lizabeth Ann Townsend, 2012). This study was the first of its kind as it has an outcome which is the SMART Measuring Device as a utility model for school laboratories. Its findings contributed to the people who are significant to the study.

Also, it may be encouraged to give support to laboratory experiments or activities in schools, and promote creative learning with the advancement of science since it has full of worth. This can formulate objectives, select subject matters and design science curricula that would inspire students to love their science subjects and make them conscious of the scientific ideas that they may apply. To add, those who are having science subjects will practice their skills and knowledge that they already have. With the use of the utility model, learning is easy and more interesting. Moreover, results of this study may encourage and motivate laboratory personnel to exercise what they had already learned in the past and apply it on how to use the SMART Measuring Device. Lastly, the results of the present study may help individuals especially those on the field of science that there is an effective laboratory device such as this.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are advised:

- School administrators may be encouraged to support laboratory experiments or activities in schools and promote creative learning with the advancement of science since it has full of worth. Coping with the rapid change of the world of science and technology is indeed needed.
- Science educators may achieve the objectives, select subject matters and design science curricula. They could also motivate the students to love their science subject by engaging and using the utility model on the science laboratory experiments. Through this, the students will be conscious of the scientific ideas that they may apply.
- Students who are having science subjects should practice the skills and knowledge that they already have especially in using the utility model on each laboratory activity that they may have. With the use of the utility model, learning is easy and more interesting on their part.

Laboratory personnel may motivate and assist the students when using the utility model. It is also an advantage on their part that they already learned how to use the existing laboratory equipment which they can apply when using the utility model.

Department of Education (DepEd), should support and be open to the modern technologies that would help the students, teachers and schools in order for them to be globally competitive in the field of science.

Delimitation of the Study

This study is focused on the development of SMART Measuring Device: Utility Model for School Laboratories to address the acceptability of the utility model and aid the inadequacy of laboratory apparatus of the school. Thirty (30) students, six (6) teachers of Kalibo Institute, Inc., and three (3) random engineers who completed a 5-year college program served as respondents of the study.

A researcher-made questionnaire was employed as the data-gathering tool to determine the acceptability of the utility device. The researcher-made questionnaire was validated by a panel of validators considering their expertise. Experts' recommendations were the basis for the finalization of the researcher-made questionnaire for conducting the research study.

For the utility model, the researcher collaborated with the electronics engineers for the development of the device or the utility model.

The utility model is only capable to measure a maximum weight of 1 kg, and 1liter volume when water is being measured. With the built-in rechargeable DC power supply, the device is operational for a maximum of 10 hours in the absence of the commercial power.

The device is limited to measure four (4) different types of liquid substances since the selected ones are the common liquids that are being used during school laboratory activities; but other types can also be added by programming the microcontroller.

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And, above all, to the Almighty God, for the opportunity to conduct this study.

Appendices

Appendix A

RESEARCH INSTRUMENT

Name: (Optional)_______________ _______ Age: _____________
Gender: [ ] Male Status: [ ] Student
[ ] Female [ ] Teacher
Other/s (please specify) ________
Last school attended: ____

Direction: This questionnaire will measure the acceptability of the utility model that was used in the laboratory activity. Please read each statement carefully and check the appropriate column that is most applicable to you. Please answer all items. Be assured that your responses will be kept confidential and will be used for research purposes only. Below are the meanings of the choices:

Very Acceptable (VA) -- if the statement describes fully acceptable. (100%)
Acceptable (A)-- if the statement somehow describes it's acceptable. (80%)
Moderately Acceptable (MA) – if you are not sure if the statement describes that is acceptable or not (50%)
Fairly Acceptable (FA)-- if the statement describes partly it is acceptable. (40%)
Not Acceptable (NA) – if the statement does not in any way describe it's acceptable.

	NA (1)	FA (2)	MA (3)	A (4)	VA (5)	Remarks
A. CONTENT						
1. Objectives on the laboratory experiment are met.						
2. Appropriate to the level of K to 12 Basic Education Curriculum (K to 12)						
3. Designed for science laboratory experiments.						
4. Attained the higher order thinking skills (HOTS) such as critical thinking, creativity, inquiry, problem solving, among others.						
5. Motivated the students through provisions of engaging the laboratory activity.						
TOTAL SCORE = __________ AREA MEAN= ___________						

	NA (1)	FA (2)	MA (3)	A (4)	VA (5)	Remarks
B. INSTRUCTIONAL AND TECHNICAL QUALITY						
6. Appropriate on the instructional reasons.						
7. Accurate and has a real-time result outcome.						

8. Efficient.						
9. Navigate easily.						
10. Stimulates the learner's creativity.						
11. Better than the existing laboratory apparatus or devices.						
12. Appealing and interesting.						
13. Used in the laboratory experiments.						
14. Possessed consistent interface components and visual cues (buttons, menu, icons, label, messages, etc.)						
15. Safe.						
TOTAL SCORE = __________ AREA MEAN= ___________						

Mean Score: ____________ Over-all: __________

C. Interview Questions: (Applicable only for the students)

1. How does the smart measuring device for school laboratories work as you used it in the laboratory experiment?
   ____
2. How would you describe your experience on using the smart measuring device for school laboratories?
   ____
3. Would you recommend the smart measuring device for school laboratories on other students and why?
   ____

____

Signature Over Printed Name of Evaluate Date

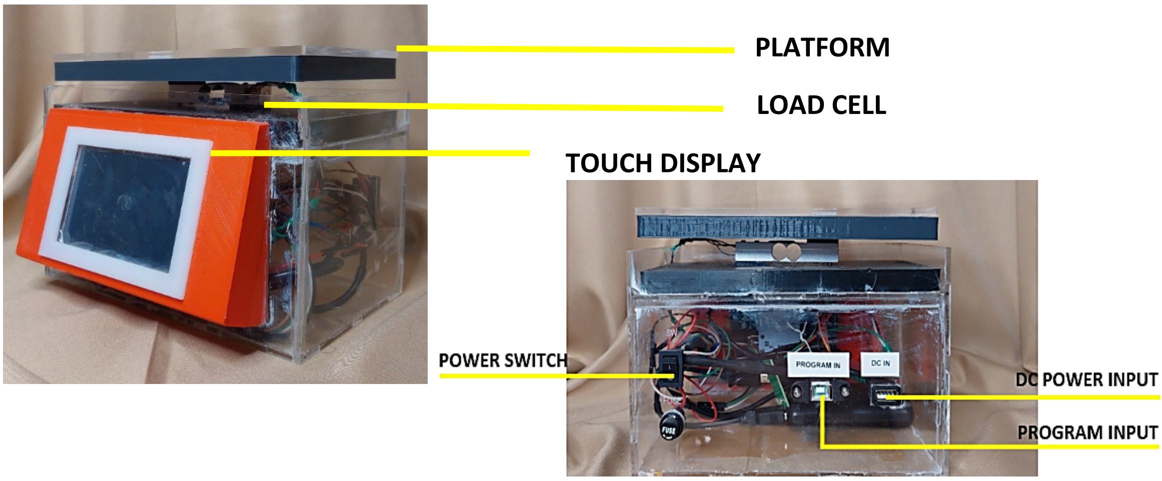
Thank you for completing this questionnaire.

MARIAN C. FAGTANAC
(Candidate, M.A. Ed. Biological Science)

Appendix B

DOCUMENTATION

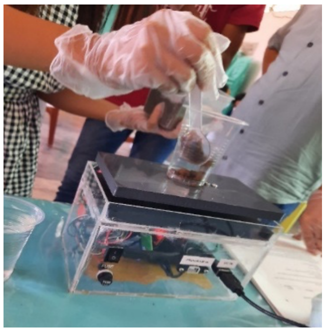
A. The SMART Measuring Device



B. Researcher with the respondents and utility model







C. Students' experiences using the utility model

As an entire group	Question No. 1	Question No. 2	Question No. 3
Student No. 1	Easy to use	So easy to use	Yes, it helps the students to have right amount of measurement.
Student No. 2	Helps to measure smoothly and not hard to use.	It is fun using it.	Yes, easy to use and can be very helpful.

Student No. 3	Weight and volume appeared quickly.	Exciting, easy to handle and we finished our activities on the given time.	Yes, I want those students to experience what I've been experienced and it is big help.
Student No. 4	The device worked well.	It meant the exact weight and grams of the matter that we needed.	Yes, we can use it and know the exact weight of our activity.
Student No. 5	Very easy to use and very high-technology device.	Easy for us to measure by using it.	Yes, easy to use and it gives you an accurate amount or anything you need to measure.
Student No. 6	Very interesting and works well.	The device is very interesting and it is working well.	Yes, because it is efficiency capability.
Student No. 7	Works well, but sometime has hard time on tapping the screen.	Good and very specific kind of device.	Yes, it's efficiency capability and specific can help my fellow students.
Student No. 8	Easy to use.	It is fun while using the device.	Yes, easy to use and it is really helpful.
Student No. 9	I am amazed as well as very acceptability.	Awesome and through this device we will gain more knowledge and wisdom.	Yes, to influence other students and to gain lots of learning.
Student No. 10	The device works well.	Very fine and very specific.	Yes, they can have interest because it is a specific device.
Student No. 11	It is easy to use.	I felt good, amazing and easy to use.	Yes, it is easy to use and good for laboratory set-up.
Student No. 12	Easy to used and it can help to students.	All good and very specific on getting the measurement.	Yes, efficiency capability and specific.
Student No. 13	The device is easy to use and easy to understand.	Very safe and it is easy to use.	Yes, not harmful and easy to use.
Student No. 14	Easy to use and it can help the students.	A device that is very high-technology and very fast to observe.	Yes, it's efficiency, capability and being specific.
Student No. 15	Easy to use.	The device is good and it was amazing.	Yes, because it needs in the laboratory.
Student No. 16	The device is easy to use.	A good experience as well as helpful.	Yes, because the device is in good condition and unique.
Student No. 17	It is easy to use.	Good, helpful in terms on modern technology.	Yes, because the said device is really need in the laboratory experiment.
Student No. 18	Easy to use.	It is good and a very specific kind of device.	Yes, because of its efficiency and capability.

Student No. 19	Easy to use and can help the students.	Good and a advanced technology device.	Yes, the device is in good condition and unique.
Student No. 20	The device is easy to use.	Amazed and easy to use as well as it helps a lot.	Yes, easy to use and also you learned so fast. It engaged students well where it is not hustle to use.
Student No. 21	Easy to use.	The device is useful and helps a lot especially on measuring.	Yes, it is easy to use and will give you a less work.
Student No. 22	I felt very amazed.	An awesome one.	Yes, I'll describe to them what are the used of this device.
Student No. 23	The device is easy to use.	It is fun and easy.	Yes, because it is modern and easy to use as well.
Student No. 24	Amazing and easy to use.	It was great and not hustle at all.	Yes, one of the easiest to use and modern.
Student No. 25	The device is easy to navigate.	It is interesting and boost individuals' creativity while using the device.	Yes, good device for a new modern generation and a new learning activities.
Student No. 26	The device works well.	It worked well.	Yes, sometimes the button is hard to press but it is useful for school laboratories.
Student No. 27	Very convenient, fun using it and very helpful.	The device is very interesting.	Yes, the device is highly recommended and it is very convenient.
Student No. 28	It works perfectly, suits to laboratories, easy to use and it's related to modern technology.	Amazed and I was attracted to the device since it easy and not hustle to use.	Yes, features were very nice and student friendly kind of device.
Student No. 29	It worked efficiently and it is easy to use.	A handy type of laboratory school equipment.	Yes, highly recommended and the activity flows activity because it is easy to use.
Student No. 30	Easily gives you an accurate result, also related to our modern technology.	I am amazed and happy. In which it can help other students.	Yes, the device is very easy to use and accurate, real time result outcome, not hustle to students using this.

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