



EASIER (EXECUTABLE ACCESS TO STATISTICS FOR INTERACTIVE AND EFFICIENT RESEARCH)

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ABSTRACT

The purpose of the study is to develop a reliable computer-aided statistical instrument for data processing.

The researcher come up to the idea to formulate an executable program running in Microsoft Excel platform. The platform is chosen based on the fact that it is widely used office application and known to be user-friendly. EASIER or Executable Access to Statistics for Interactive and Efficient Research was born. Executable because the program can be run by a computer, it is accessible in terms that most teachers use MS Excel as an office application, it can solve and analyze most statistics problems, interactive because there is a two-way flow of information between a computer and the user which respond to a certain input, the system promise to achieve a maximum productivity with a minimum wasted effort or expense, and to establish facts and reach new conclusions.

The statistical instrument was evaluated by twenty-four (24) Senior High School Teachers from Nagcarlan, Liliw, Majayjay, Magdalena, Pila, Victoria, and Sta. Cruz district and six (6) College Teachers from Laguna State Polytechnic University Sta. Cruz Main Campus, and from Philippine Women's University Sta. Cruz, Laguna.

It sought to answer the following questions: (1). What is the mean level of basic requirements of using computer-aided statistical instrument in terms of: 1.1 knowledge, 1.2 software and 1.3 hardware.? (2). What is the mean level of capability of EASIER as a computer-aided statistical instrument in computing statistical problems in terms of: 2.1 accepting input and data parameters, 2.2 organizing data, and 2.3 generating result, figures, charts, and drawing conclusion? (3). What is the mean level of acceptability of EASIER as a computer-aided statistical instrument in statistical analysis in terms of; 3.1 tool interface, and 3.2 operation and function? (4). Is there a significant difference between the level of responses of teachers from Senior High School and College instructors in terms of capability and acceptability of EASIER as a computer-aided statistical instrument?

The teacher respondents tested and evaluated EASIER based on the survey questionnaire. Weighted mean and standard deviation were used to measure the mean level requirement of using computer-aided statistical instrument and the mean level capability and acceptability of EASIER as candidate to be one of the computer-aided statistical instruments.

The statistical data reveal the following findings:

The level of requirements in terms of knowledge, software, and hardware got an overall mean of 4.81, 4.83, and 4.75 respectively, which are stated to be "Completely Required". This means that even there is a powerful computer-aided statistical instrument, certain amount of knowledge is required to deal with data analysis. (2.) The level of capability of EASIER in terms of accepting input and data parameters, organizing data, and generating result, figures, charts, and drawing conclusion showed "Very High Capability" with overall mean of 4.84, 4.76, and 4.90 respectively. These gathered means indicate that EASIER can perform data analysis at high level and capable of managing data according to the ways no other available instrument can, especially in generating conclusions. (3.) The level of acceptability of EASIER in terms of tool interface, and operations and functions are "Acceptable" with an overall mean of 4.86 and 4.89. This shows that aside from being a powerful computer-aided statistical instrument, EASIER appears to be appealing to respondents on how it looks and how it handles data. EASIER is also reliable and dependable instrument for data analysis through real-time and accurate computation. Further, EASIER can be innovated at some point making it better and updated. (4.) The difference between how Senior High School Teachers and College Teachers perceive EASIER is "Not Significant". Meaning, though these teachers treat Statistics and Probability at different level, and with the manner they use different available statistical instrument, EASIER is accepted to be a powerful computer-aided statistical instrument.



INTRODUCTION

“Human needs never end”, in desperation to satisfy all demands increase; inventions, creations, and formulations also rises. People accustoms to adapt to new things as their desire and wants increases each day. When people encountered difficulties, they usually think of solutions to overcome those challenges. Here comes the role of research, which may result in the development and advancement of society specially in the field of information and communications where computer-aided design and computing are very evident and imminent.

Statistics as a body of science that collects, analyzes, interprets, and presents data starting from a population down to an acceptable number of samples plays important role in research. Statistics involves crucial method behind how people make discoveries, make decision based on gathered data, and construct predictions. The mathematical foundation of modern statistics was established with the development of the probability in which in turn laid the foundation of inferential statistics.

Inferential statistics allow researchers to make predictions or inferences from available data. With this, researcher take data from samples and make generalizations about a population. Inference is a really difficult concepts and is the only key to inferential statistics. It is usually involved with a large amount of data that necessitates skills on the part of the researcher.

Inferential analysis, which is the hardest part gives meaning to a lifeless data and is a very integral part of any research because it showcases important details from the hypotheses down to conclusion based on the assumptions, computations, differentiation, and seeking relations between two or more groups. Most researchers find this part as difficult and challenging because, it poses a different level of knowledge to cope with the numerical results. Researchers often seek the help of a mathematics practitioner which somehow form additional task and challenges.

This research study proposes a computer-aided statistical instrument that would help to alleviate the difficulties encountered by researchers in terms of data processing.

RESEARCH METHODOLOGY

Research Design

The study aimed to design and develop a computer-aided statistical instrument to help teachers in doing action research and provide a reliable instructional material.

The study employed both descriptive and experimental method of research. Descriptive research narrates a population, situation or phenomenon that is being studied focuses in dealing and answering how, what, when and where questions. Descriptive research also involves collecting data in order to answer questions regarding the study about current status of the subject or prevailing conditions. (Lambert, 2012). Survey questionnaire were given and distributed through Google Forms after the study was shown to each respondent through face-to-face, Google Meet and recorded video presentation to determine the acceptability of EASIER with respect to its basic requirements, how it accepts inputs and data parameters, data organization, generating results, tool interface, and operations and functions. The experimental part is to determine the difference between the replies of the two groups of respondents form out of thirty Senior High School teachers and collegiate teachers. This will indicate how EASIER will be accepted from two major departments where Statistics and Probability is being taught.

Respondents of the Study

The respondents of the study were selected by purposive sampling. Twenty-four (24) senior high school math teachers handling Statistics and Probability for Grade 11 from the district of Nagcarlan, Liliw, Majayjay, Magdalena, Pila, Victoria, and Santa Cruz, and six (6) college math teachers handling Advanced Statistics and Probability from Laguna State University (LSPU) Main Campus and Liliw Extension and Philippine Women’s University Santa Cruz, Laguna (PWU-CDCEC) were chosen. The coverage area of the study seems very large considering the number of mathematics teacher available with a maximum of at least two (2) per school who handle Statistics and Probability.

Sampling Techniques

The teachers were selected using purposive sampling technique. This technique was used to ensure that out of mathematics teachers available per area, teachers who only handle statistics and probability will be selected. As stated by (Crossman, 2017) purposive sample is a non-probability sample that is selected based on characteristics of a population and the objective of the study. The sampling unit will be based on the subjective judgement of the researcher.

The Research Procedure

Series of methodologies and procedures were followed to evaluate EASIER as a reliable and acceptable computer-aided statistical instrument.

Stage 1 – Programming of EASIER



The researcher who is equipped with Mathematical and Information Technology expertise made the content of EASIER. With a high level of logical thinking, formulas and function were combined so as to create a

powerful computer-aided statistical instrument. Series of problems from the web and personal research were used to test for its accuracy and reliability. It is one-whole year in the making.

Stage 2 – Validation of EASIER

With the approval of the thesis adviser and assurance of the Statistician with the survey questionnaires, the researcher sought the permission of the DepEd-Division Office and principals to conduct the study within the district of Nagcarlan, Liliw, Majayjay, Magdalena, Pila, Victoria and Sta. Cruz. EASIER was presented to thirty (30) selected Senior High School Teachers and College Instructors. Statistics problem were given to respondents, each will be computed using MS Excel Data Analysis and EASIER. Answers from the two computer-aided statistical instruments are compared for consistency.

This study was conducted during the first semestral of Academic Year 2020-2021 in Nagcarlan, Liliw, Majayjay, Magdalena, Pila, Victoria, and Santa Cruz District.

Problem was identified, analyzed, constructed, and presented to the panel of experts and was approved. Statement of the problem, hypotheses, theoretical framework, conceptual framework, and literature related to the study were developed and presented for review.

With the help of a self-made instrument which was validated by the panel of experts, survey was initiated from the purposively chosen respondents and data were collected.

Data are then organized and analyzed. The level of requirements, level of capability and level of

acceptability was calculated using mean and standard deviation.

Finally, conclusions are drawn from the derived statistically treated result.

The Research Instrument

The researcher formulated and developed the content of EASIER based from mathematical principle along with Statistics and Probability. Inferential Statistics problem were given to the respondents to test the accuracy of EASIER based on the premise that it will generate necessary requirements of the quantitative research limited to hypotheses, decision rule, computed value, effect size, post-hoc, and conclusion. Using the data gathered from the respondent's groups Senior High School teachers and College Teachers, the mean level of basic requirements, level of capability and level of acceptability were computed and concluded. The difference between the response of the two groups are compared to determine the level of accuracy and reliability of EASIER.

Statistical Treatment of Data

To answer a valid and reliable presentation, analysis and interpretation of the problem, the following statistical treatment were used.

Table 1. Statistical Treatment

Statement of the Problem	Statistical Treatment
To determine the level of basic requirements of EASIER in terms of knowledge, software, and hardware.	Mean and Standard Deviation
To determine the level of capability of EASIER in terms of accepting inputs and data parameters, organizing data, and generating results, figures, charts, and conclusion.	Mean and Standard Deviation
To determine the level of acceptability of EASIER in terms of tool interface, and operations and functions.	Mean and Standard Deviation
To determine the significant difference of the level of responses between Senior High School Teachers and College Teachers	T-test for uncorrelated Samples



The results of the responses were collected using Google Form in which results are already tallied. Mean and standard deviation were computed to determine the level of basic requirements, level of capability and level of acceptability.

Uncorrelated sample T-test was used to compare and determine the difference between the level of responses of the two respondent's group, the Senior High School Teachers and College Teachers. A p-value is also computed to support the test to note if the probability of the results of the sample data occurred by chance.

RESULTS AND DISCUSSIONS

The level of required framework, capability and acceptability of EASIER was evaluated based on knowledge requirements, software requirements, hardware requirements, accepting inputs and data parameters, organizing data, generating results, figures, charts, and conclusions, tool Interface, and operations and functions.

Table 1 shows the teachers' evaluation on the level of required framework of using computer-aided statistical instrument based on knowledge.

Table 1. Knowledge Requirements

Knowledge Requirements	Mean	S.D.	Verbal Interpretation
1. Researchers should have basic knowledge in operating computer and other digital devices.	4.83	0.46	<i>Completely Required</i>
2. Researchers should have basic knowledge in statistical analysis.	4.87	0.43	<i>Completely Required</i>
3. Researchers should know how to manipulate data meaningfully.	4.87	0.43	<i>Completely Required</i>
4. Researchers should have basic knowledge in Microsoft Excel.	4.80	0.48	<i>Completely Required</i>
5. Researchers should have knowledge in exporting MS Excel into another format.	4.67	0.61	<i>Completely Required</i>
Overall Mean	4.81	Completely Required	

Legend:

- 4.20 – 5.00 *Completely Required (CR)*
- 3.20 – 4.19 *Considerably Required (CoR)*
- 2.40 – 3.19 *Moderately Required (MR)*
- 1.80 – 2.39 *Slightly Required (SR)*
- 1.00 – 1.79 *Not at All Required (NR)*

The teachers strongly believe that knowledge in statistics play important role in using computer aided statistical instrument like EASIER, that basic knowledge in computer and other digital devices is required (M=4.83, sd=0.46), basic knowledge in statistical analysis (M=4.87, sd=0.43), manipulating data meaningfully (M=4.87, sd=0.43), basic knowledge in MS Excel (M=4.80, sd=0.48), and knowledge in exporting MS Excel into another format (M=4.67, sd=0.61)

The overall mean of 4.81 indicates that teachers strongly believe on having knowledge on

statistics, computer operations, and computer applications are requirements in using computer-aided statistical instrument. This means that although computer-aided statistical instruments are widely available on the market or over the internet, researchers should always have basic knowledge on statistical analysis (Gal 2002), digital devices and some basic applications running on it to perform data analysis.

Table 2 shows the teachers' evaluation on the level of required framework in using computer-aided statistical instrument as a software for data analysis.

**Table 2. Software Requirements**

Software Requirements	Mean	S.D.	Verbal Interpretation
1. Researchers may rely on computer aided statistical instrument to work faster and efficient.	4.77	0.43	<i>Completely Required</i>
2. Researchers with less mathematical background may rely deeply to computer aided statistical instrument.	4.67	0.48	<i>Completely Required</i>
3. Computer aided statistical instrument must provide better execution and mobility.	4.90	0.31	<i>Completely Required</i>
4. Computer aided statistical instrument must provide convenience on the part of the researcher on quantifying lifeless data.	4.90	0.31	<i>Completely Required</i>
5. Computer aided statistical instrument must be reliable and dependable.	4.93	0.25	<i>Completely Required</i>
Overall Mean	4.83	<i>Completely Required</i>	

Legend:

- 4.20 – 5.00 *Completely Required (CR)*
 3.20 – 4.19 *Considerably Required (CoR)*
 2.40 – 3.19 *Moderately Required (MR)*
 1.80 – 2.39 *Slightly Required (SR)*
 1.00 – 1.79 *Not at All Required (NR)*

Teachers also believe that relying on computer aided statistical instrument can make computing faster and efficient (M=4.77, sd=0.43), researchers from other field may rely on computer aided statistical instrument (M=4.67, sd=0.48), computer aided statistical instrument must provided better execution and mobility (M=4.90, sd=0.31), computer aided statistical instrument can be used conveniently (M=4.90, sd=0.31), and computer aided statistical instrument must be reliable and dependable (M=4.93, sd=0.25)

The overall mean of 4.83 suggests the importance of having a reliable and dependable computer aided statistical instrument in the form of spreadsheet like EASIER in dealing with lifeless data

for a meaningful analysis. Researchers outside the field of mathematics may rely deeply to computer aided statistical instrument to cater their thirst for data manipulation requirements. However, the computer-aided statistical instrument must supply most of the required figures and results for beginners and non-mathematically inclined individual to follow. As mentioned by McGill (2015) spreadsheet knowledge shows to be important in influencing the quality of the system being developed and acts directly upon the individual impact of the application.

Table 3 shows the teachers' evaluation on the level of required framework of using computer-aided statistical instrument based on hardware.

Table 3. Hardware Requirements

Hardware Requirements	Mean	S.D.	Verbal Interpretation
1. Computer aided statistical instrument must meet minimum hardware requirement to cater major type of users.	4.87	0.35	<i>Completely Required</i>
2. Offline computer aided statistical instrument provides faster execution in a more convenient way.	4.60	0.86	<i>Completely Required</i>
3. Computer aided statistical instrument must be compatible in a variety of digital devices for convenience and mobility.	4.87	0.35	<i>Completely Required</i>
4. Computer aided statistical instrument should provide option for printing to output organized results.	4.73	0.52	<i>Completely Required</i>
5. Computer aided statistical instrument must be accessible by multiple users through local area network.	4.67	0.66	<i>Completely Required</i>
Overall Mean	4.75	<i>Completely Required</i>	



Legend:

- 4.20 – 5.00 *Completely Required (CR)*
 3.20 – 4.19 *Considerably Required (CoR)*
 2.40 – 3.19 *Moderately Required (MR)*
 1.80 – 2.39 *Slightly Required (SR)*
 1.00 – 1.79 *Not at All Required (NR)*

Hardware is also a part of computer aided statistical instrument requirements that teachers believe that the instrument must run at a minimum hardware parameter (M=4.87, sd=0.35), having reliable offline instrument is more convenient (M=4.60, sd=0.86), the statistical instrument is compatible with a variety of digital devices (M=4.87, sd=0.35), the statistical instrument can output hard copies of organized results (M=4.73, sd=0.52), and the statistical instrument must be accessible by multiple user for sharing (M=4.67, sd=0.66)

The overall mean of 4.75 indicates that hardware must coincide with computer aided statistical

instrument like EASIER to produce desirable results. Heavy computing applications relies on sufficient hardware requirement to work faster and to prevent computers to freeze. Though EASIER can be accomplished with a minimum hardware requirement, fast data processing can be done in new and high computer's architecture as elaborated by Ailamaki, (2015).

Table 4 shows the teachers' evaluation on the level of capability of EASIER based on accepting inputs and data parameters.

Table 4. Accepting Inputs and Data Parameters

Accepting Inputs and Data Parameters	Mean	S.D.	Verbal Interpretation
1. The instrument provides a wide range of statistical tool and data analysis.	4.70	0.53	<i>Very High Capability</i>
2. Statistical tools can be easily selected and directed to the statistical operation.	4.90	0.31	<i>Very High Capability</i>
3. There are enough cells provided for the inputs.	4.77	0.50	<i>Very High Capability</i>
4. The instrument provides different alpha or significant levels.	4.93	0.25	<i>Very High Capability</i>
5. The instrument is capable of displaying one-tailed and two-tailed direction with corresponding critical values.	4.97	0.18	<i>Very High Capability</i>
Overall Mean	4.85		<i>Very High Capability</i>

Legend:

- 4.20 – 5.00 *Very High Capability (VC)*
 3.20 – 4.19 *High Capability (HC)*
 2.40 – 3.19 *Moderate Capability (MC)*
 1.80 – 2.39 *Low Capability (LC)*
 1.00 – 1.79 *Very Low Capability (VLC)*

With respect to the manner of how EASIER works, especially in accepting inputs and data parameters, teachers rated the capability of EASIER to be very high in terms of providing a wide range of statistical tool (M=4.70, sd=0.53), tools are very manageable (M=4.90, sd=0.31), slots for inputs are sufficient (M=4.77, sd=0.50), the instrument provides different alpha levels to choose from (M=4.93, sd=0.25) and directional and non-directional parameters are also available (M=4.97, sd=0.18).

With an overall mean of 4.85, this indicates that EASIER can accept enough inputs to cater

different researchers need in data organization and analysis. White et al (2003) stated that controlling the type of data or the values that users can enter into a cell is important to ensure that the process is an error-free as possible through data validation. Diverse statistical tools available within the computer-aided statistical instrument can fulfill larger area of data analysis to provide data maneuvers to researchers.

Table 5 shows the teachers' evaluation on the level of capability of EASIER based on organizing data.

**Table 5. Organizing Data**

Organizing Data	Mean	S.D.	Verbal Interpretation
1. The statistical instrument is designed with scientific and mathematical basis.	4.77	0.43	<i>Very High Capability</i>
2. The statistical instrument is easy to use for novice single user and for large groups and experts.	4.73	0.45	<i>Very High Capability</i>
3. The statistical instrument design includes a capability for reprocessing and error corrections.	4.77	0.50	<i>Very High Capability</i>
4. Access to the statistical instrument is practical and cost-effective.	4.77	0.50	<i>Very High Capability</i>
5. There are enough tables provided for data structure.	4.70	0.60	<i>Very High Capability</i>
6. Cells containing relevant formulas are kept protected.	4.70	0.53	<i>Very High Capability</i>
7. Steps in data analysis are presented in the instrument for proper execution of data.	4.80	0.48	<i>Very High Capability</i>
8. Decision rules are well presented	4.83	0.46	<i>Very High Capability</i>
9. The general conclusion provides sufficient amount of information.	4.73	0.58	<i>Very High Capability</i>
10. The general conclusion part is easily understood by users.	4.77	0.63	<i>Very High Capability</i>
Overall Mean	4.76	<i>Very High Capability</i>	

Legend:

4.20 – 5.00 *Very High Capability (VC)*

3.20 – 4.19 *High Capability (HC)*

2.40 – 3.19 *Moderate Capability (MC)*

1.80 – 2.39 *Low Capability (LC)*

1.00 – 1.79 *Very Low Capability (VLC)*

Table 5 shows how EASIER organize data once required values are loaded to the instrument and how EASIER was designed to meet certain standards in terms of mathematical basis (M=4.77, sd=0.43), the instrument is designed to be used by novice single user or groups (M=4.73, sd=0.45), error can be managed (M=4.77, sd=0.50), access to the instrument is cost-effective (M=4.77, sd=0.50), table are provided to view data structure (M=4.70, sd=0.60), formulas are well protected (M=4.70, sd=0.53), steps can be viewed along with the process (M=4.80, sd=0.48), decision rules are presented (M=4.83, sd=0.46), generated conclusion contains enough information (M=4.73, 0.58), and conclusion can be easily understood (M=4.77, sd=0.63)

In terms of organizing data, an overall mean of 4.76 proves that EASIER handles data manageably, the process are well presented, and the generated results are easily understood by both mathematically and non-mathematically inclined individual. The designed and execution of EASIER are based on mathematical fact and processes. Consistency is the first rule in data organization which is seen on EASIER. Murrell (2003) stated that the practical law is that organizing data is presenting it in a way both humans and computer can understand.

Table 6 shows the teachers' evaluation on the level of capability of EASIER based on generating results, figures, charts, and conclusions.



Table 6. Generating results, figures, charts, and conclusions

Generating results, figures, charts, and conclusions	Mean	S.D.	Verbal Interpretation
1. Hypotheses are systematically generated both in words and in symbols	4.90	0.31	<i>Very High Capability</i>
2. Graphs are provided and interpreted for additional information	4.90	0.31	<i>Very High Capability</i>
3. The statistical instrument computes statistics value correctly	4.93	0.25	<i>Very High Capability</i>
4. The statistical instrument shows critical value according to the table	4.97	0.18	<i>Very High Capability</i>
5. Decision is provided upon the comparison of the critical values against the computed value	5.00	0.00	<i>Very High Capability</i>
6. P-values are accurately computed for additional support	4.93	0.25	<i>Very High Capability</i>
7. P-value is compared to the level of significance for decision	4.97	0.18	<i>Very High Capability</i>
8. Effect size is accurately computed to quantify the difference between two groups	4.77	0.50	<i>Very High Capability</i>
9. The statistical instrument generates conclusion correctly	4.80	0.41	<i>Very High Capability</i>
10. The general conclusion presents all gathered and computed values	4.80	0.41	<i>Very High Capability</i>
Overall Mean	4.90		<i>Very High Capability</i>

Legend:

- 4.20 – 5.00 *Very High Capability (VC)*
- 3.20 – 4.19 *High Capability (HC)*
- 2.40 – 3.19 *Moderate Capability (MC)*
- 1.80 – 2.39 *Low Capability (LC)*
- 1.00 – 1.79 *Very Low Capability (VLC)*

The capability of EASIER is not limited to how it organize data but more on how output are produce and presented to the users in terms of generating hypotheses in words and in symbol (M=4.90 sd=0.31), graphs are interpreted for addional information (M=4.90, sd=0.31), statistics value are computed correctly (M=4.93, sd=0.25), critical values are presented according to the table (M=4.97, sd=0.18), the statiscal value and critical value are comapared (M=5.00, sd=0.00), the level significance are computed correctly for additional support (M=4.93, sd=0.25), P-value is compared with alpha levels (M=4.97, sd=0.18), effect size is computed to show how signifiant relationships or difference are (M=4.77, sd=0.50), the generated conclusion is correct (M=4.80, sd=0.41), and the generated conclusion provide necessary information (M=4.80, sd=0.41)

An overall mean of 4.90 sufficiently proves that EASIER can generate accurate results within the allowable range, graphs are available to show relationships status between variables clearly with interpretation, supports for decision are available, and hypotheses are well generated and concluded. The accuracy of the results using EASIER are done through experimentation whereby problems are being loaded for comparison after being solved and tested using other available statistical instrument, though Collopy (2002) states that from a theoretical point of view there is a problem as no single method can be designated as the best to perform badly in all accuracy measures. Further testing and application is suggested to measure its accuracy.

Table 7 shows the teachers' evaluation on the level of acceptability of EASIER based on tools interface or how it looks.



Table 7. Tool Interface

Tool Interface	Mean	S.D.	Verbal Interpretation
1. Introductory screen is interesting	4.83	0.38	Acceptable
2. Homepage resembles statistical tools and labels	4.87	0.35	Acceptable
3. Statistical tools are properly organized	4.90	0.31	Acceptable
4. Statistical tools are easily distinguished	4.90	0.31	Acceptable
5. Available statistical tools are sufficient for basic statistical analysis	4.87	0.35	Acceptable
6. The instrument has clear view, displaying readable words and numbers	4.87	0.35	Acceptable
7. Color's blending is pleasingly displayed	4.80	0.48	Acceptable
8. Buttons and arrows are available for easy operation and maneuvers	4.87	0.35	Acceptable
9. Input cells can be easily identified	4.87	0.35	Acceptable
10. The instrument shows relevant graphs and charts	4.87	0.35	Acceptable
11. Tables are well presented and organized	4.90	0.31	Acceptable
12. The computed statistics, alpha level, and p-values is presented in APA format	4.83	0.38	Acceptable
Overall Mean	4.86		Acceptable

Legend:

- 4.20 – 5.00 Acceptable (A)
- 3.20 – 4.19 Slightly Acceptable (SA)
- 2.40 – 3.19 Neutral (N)
- 1.80 – 2.39 Slightly Unacceptable (SUA)
- 1.00 – 1.79 Unacceptable (U)

Table 7 shows how EASIER appeals to the users in terms of how it looks based on introductory screen (M=4.83, sd=0.38), homepage provides available tools (M=4.87, sd=0.35), statistical tools are properly organized (M=4.90, sd=0.31), statistical tools are easily distinguished (M=4.90, sd=0.31), statistical tools available are sufficient (M=4.87, sd=0.35), displays are readable (M=4.87, sd=0.35), colors are pleasingly displayed (M=4.80, sd=0.48), directional; arrows are available for easy maneuvers (M=4.87, sd=0.35), input cells can be easily identified (M=4.87, sd=0.35), graphs and charts are available (M=4.87, sd=0.35), tables are well presented and organized (M=4.90, sd=0.31), and the presentation of output is in

APA format providing clarity to papers (M=4.83, sd=0.38)

The overall mean of 4.86 shows that the tool interface of EASIER is acceptable and appealing to respondents, color blending is pleasingly displayed, and words are readable. Ali Darejeh and Dalbir Singh (2003) states that commonalities were used to extract user interface design principles such as reducing the number of features, avoiding using computer terms, putting customization ability to font, color, and size and using appropriate graphical objects such as avatar or icon.

Table 8 shows the teachers' evaluation on the level of acceptability of EASIER based on operations and functions.

**Table 8. Operations and Functions**

Operations and Functions	Mean	S.D.	Verbal Interpretation
1. The statistical instrument is easy to use and user-friendly	4.93	0.25	<i>Acceptable</i>
2. The statistical instrument meets basic function relevant to statistical analysis	4.97	0.18	<i>Acceptable</i>
3. The statistical instrument can be used offline making it more interactive	4.90	0.31	<i>Acceptable</i>
4. The statistical instrument can be easily programmed to adopt to certain issues and corrections	4.77	0.50	<i>Acceptable</i>
5. Computing is real-time; tables, charts and figures are adoptive to inputs	4.90	0.31	<i>Acceptable</i>
6. The statistical instrument is reliable, can be trusted as computing mechanism	4.93	0.25	<i>Acceptable</i>
7. The statistical instrument is compatible to major digital devices used by teachers	4.80	0.41	<i>Acceptable</i>
8. The statistical instrument performs accurately and at high speed	4.90	0.31	<i>Acceptable</i>
9. Continuous improvement from major types of users is vital	4.90	0.31	<i>Acceptable</i>
10. The statistical instrument can be innovated, making it better and updated	4.93	0.25	<i>Acceptable</i>
Overall Mean	4.89		<i>Acceptable</i>

Legend:

- 4.20 – 5.00 *Acceptable (A)*
- 3.20 – 4.19 *Slightly Acceptable (SA)*
- 2.40 – 3.19 *Neutral (N)*
- 1.80 – 2.39 *Slightly Unacceptable (SUA)*
- 1.00 – 1.79 *Unacceptable (U)*

Table 8 shows the condition of EASIER as an effective statistical instrument in terms of being user-friendly (M=4.93, sd=0.25), how Easier meets with basic function of statistical analysis (M=4.97, sd=0.18), being offline statistical solver making it more interactive to user (M=4.90, sd=0.31), EASIER can adopt to correction (M=4.77, sd=0.50), computing is real-time (M=4.90, sd=0.31), the statistical instrument is reliable (M=4.93, sd=0.25), EASIER is compatible with major digital devices (M=4.80, sd=0.41), EASIER performs at high speed (M=4.90, sd=0.31), improvements can be done by users (M=4.90, sd=0.31), and that EASIER can be innovated making it better and updated (M=4.93, sd=0.25).

The overall mean of 4.89 shows how EASIER is accepted by teachers as one of the available computer aided instrument that will provide reliable and dependable statistical results, analysis, and outputs. EASIER can also be innovated and improve to make it more powerful tool to cater parametric and non-parametric test. According to Reynolds, (2007), most programming systems which attempt to provide flexible and efficient data representations require the user to specify the range of variables, parameters, and function by extensive and detailed data structure declaration.



Table 9. Difference between the responses of Senior High School Teachers and College Teachers

Groups	Mean Score	Mean Difference	t-value	p-value	Remarks
SHS Teachers	4.86	0.12	1.229	0.229	Not Significant
College Teachers	4.74				

As shown in the table, SHS teachers registered a mean response of 4.86 while College teachers got a mean response of 4.74 with a mean difference of 0.12. The computed t-value of 1.229 was compared to its critical value for two-tailed direction and alpha of 0.5 to be 2.048 and was attested by a p-value of 0.229 which is higher than the threshold value.

These findings indicate that there was no significant difference between the responses of Senior High School Teachers and College Teachers in terms of accepting EASIER as a reliable computer-aided statistical instrument, that although they are dealing with Statistics and Probability at different level they look at EASIER as a competitive computer-aided statistical instrument to deal with data analysis applicable for conducting action research and as a teaching materials for senior high school and college students.

CONCLUSION

From the result of the study the following conclusion was made:

The null hypothesis stating that there is no significant difference between the responses of teachers from Senior High School and College instructors in terms of capability and acceptability of EASIER as a computer-aided statistical instrument was accepted.

Based on the findings gathered from the analysis and interpretation of data, Senior High School Teachers and College Teachers treated EASIER the same way although they handle statistics and probability at different level. This means that EASIER can accommodate both senior high school and college level in terms of data manipulation and processing. EASIER was also accepted to be a reliable computer-aided statistical instrument based on the responses from the capability and acceptability level in terms of how it processes data and generate valuable results. Further, while EASIER is extremely useful, it was also revealed that certain amount of statistical and computer knowledge is required.

RECOMMENDATION

Based on the results of the study and from the conclusion made, the following recommendation where hereby suggested:

(1). From the responses of the teachers surveyed, EASIER can be utilized as a powerful computer-aided statistical instrument to help teachers in dealing with inferential analysis in conducting action research. (2). Teachers can also use EASIER as an instructional material for checking statistical data analysis after manual calculation method are discussed to the students, this will further develop teachers and students' engagement specially during the time of pandemic where face-to-face interaction cannot be materialized. (3) Future researchers can further enhance EASIER by adding non-parametric test making it even more powerful computer-aided statistical instrument.

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