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Research Infographic: An Innovative Instructional System Design Teaching Steps in Writing a Research Paper

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ABSTRACT

Research is viewed as a complex subject matter for students of all levels and various disciplines, as observed by the Research Center of the Dalubhasaan ng Lunsod ng San Pablo (DLSP). According to the pre-test conducted, 62% of the Grade 11 students in DLSP Integrated School answered that they do not like research as a subject. Moreover, 94% of students answered that they do not wish to learn more about research. Naturalistic observation suggests a better alternative to conventional classroom teaching strategies. An infographic ISD module was conceptualized using the ADDIE Model. After being exposed to the ISD module, more of the target learners were able to identify and analyze the steps in writing a research paper. Using McNemar's test, there was a significant difference in the target learners' idea in steps in making a research paper, with a staggering result of p= .000. A significant difference was detected in the student's desire to learn more about research after viewing the ISD module with the pre- and post-intervention of p= .017. Some of the generalizations are; there is nothing to improve in the ISD module because it is what they need to learn about research, and it is informative and easy to understand. An additional criterion of the ISD module effectivity was contributed by the reported performance evaluation of the target learners. Their final research outputs scored 85% - 93% as an average rating.

Keywords **—** Research, Instructional Design (ISD), ADDIE Model, pre-test, post-test, McNemar's test, Philippines

INTRODUCTION

Research is viewed as a complex subject matter for students of all levels in various disciplines, as observed by the Dalubhasaan ng Lunsod ng San Pablo Center for Research and Development (DLSP-CRD). A needs assessment was administered to all seventy-eight (78) Grade 11 students who are taking Research I. 62% of target-learners answered that they do not like research for reasons such as it is difficult, it is stressful to do, and it takes a lot of time as indicated reasons in their answers to the questionnaire.

One of DLSP-CRD's mission is to nurture the research capacity of faculty and students. To fulfill it, the center leads the research council and research instructors in designing projects that would greatly help engage students in research. In addition, students expect educators to come up with a better alternative to conventional classroom teaching strategies. This study developed a mechanism based on the students' chosen media to learn the steps in making a research paper, which is through infographic/posters, garnering 44% of the votes.

In a study by Qasem and Zayid (2019), they explored the challenges students face when writing proposals and research projects at the early stages. They stated that research, by its nature, is a critical, challenging task that requires in-depth knowledge of the subject matter, planning, care, and hard work.

The Republic Act 10533, also known as the Enhanced Basic Education Act, entails additional studies of two years for high school learners. Moreover, listed as one of the standards and principles of this program is that the K to 12 curriculum should be relevant, responsive, and research-based. Grade 11 Humanities and Social Sciences (HUMSS), Science and Technology, Engineering and Mathematics (STEM), Accountancy and Business Management (ABM), Technical Vocational Livelihood (TVL): Automotive and Information and Communication's Technology students have various scholastic needs which will make them effective and efficient in their future careers. Knowledge in technical writing is a must for all professionals, thus including research subjects in the k-12 curriculum.

In the Philippine context, universities, and colleges, both private and public, are expected to articulate much drive in generating knowledge through research

(Wa-Mbaleka, 2015). Several policies for research and development have been raised primarily to reinforce the contribution of Higher Education Institutions (HEIs) to "research productivity" (Regadio & Tullao, 2015).

Making research has become a necessary commodity in a globalizing world because it does not just generate new knowledge that brings innovations and progress (Czarl & Belovecs, 2007; Khan, 2015; Sibiya, 2011), it also serves as a platform for any academic institutions to develop and aid in the provision of quality education (Naz & Malik, 2014). For that matter, institutions of higher learning have placed greater emphasis on researching to come up with evidence-based policies and programs, to discover solutions to the pressing and mounting challenges of humanity, and to bolster effectiveness in knowledge sharing, technological advancement, and industrial efficiency (Bourke & Loveridge, 2017; Hottenrott & Thorwarth, 2011).

Research is generally interesting, for it is an objective, empirical, and analytical representation of one's idea; however, due to its technicality, young learners view it as a difficult subject matter. In the Philippines, most senior high school learners have difficulty explicating their study content due to their lack of knowledge in conducting and writing a research paper (Martinez, 2019). As an Introduction to Research, Grade 11 students have been taught of the nature of inquiry and research, qualitative research and its importance in daily life, review of related literature, data collection, and finding and conclusions. Through the subject, Grade 11 students are expected to develop critical thinking and problem-solving skills towards the end of the year.

Abejuela (2014) revealed that some causes of students' difficulty in writing a research paper were due to their lack of familiarity, a reason rooted in their limited knowledge of and exposure to writing academically, and their experience in lack of advisor's support.

The researcher conceptualized an infographic specifically designed to help students in their research subject, after the deliberation of the needs assessment. The infographic ISD module was conceptualized using the ADDIE Model. In particular, the instruction of the *"Steps in Making a Research Paper"* is a holistic approach, for it can be applied in the daily learning of research as a subject. Whereas, the content of the subject taught is highly concentrated on the parts of research, disregarding the essential process in research making.

FRAMEWORK

Figure 1. Conceptual Paradigm

In this study, a pre-test was conducted to assess the needs of the target learners' knowledge in making a research paper as well as their chosen media form to learn it. Most of the target learners would like to learn the steps in writing a research paper from another media form, based on the result of the pre-test. Therefore, an innovative ISD module in teaching research was formed. It was designed with a simple but catchy interface sufficed in developing the target learners' interest in research.

The "steps in writing a research paper" was adapted from the North Hunterdon-Vorhees Regional High School (2016) District's published English paper. The steps were in less difficult, easy to understand words. The infographic were posted in four classrooms of four sections (target learners) for a 2-3 weeks period. Their teachers told target learners that they could freely consult the infographic whenever they felt the need to learn/ re-learn the steps in writing the research paper.

As a form of evaluation, a post-test was conducted. In it are reciprocal questions to the pre-test to see if there has been a significant change to the perception and performance of the target learners. Moreover, this research specifically utilized a type of quasi-experimental design that is called "Pretest-Posttest Design." According to Grabbe (2015), a pretest-post-test design uses one group selected based upon a pre-existing condition for selection. In this case, the researcher chose the Grade 11 students based upon a desire to examine if the intervention (ISD module) affects the dependent variable (target learners' knowledge about research).

OBJECTIVES OF THE STUDY

This study aims to stimulate learner's interest in making a research paper so that they will be able to identify and analyze the steps in writing a research paper. It sought to teach the students to write a research paper referring to the ten steps in writing a research paper indicated in the Research Infographic.

METHODOLOGY

Research Design

This study is a quantitative method and a quasi-experimental design. The target learners were given a pre-test/needs assessment. This research specifically utilized a type of quasi-experimental design that is called "Pretest-Posttest Design." According to Grabbe (2015), a pretest-post-test design uses one group selected based upon a pre-existing condition for selection. In this case, one may choose a specific group based upon a desire to examine if the treatment affects the dependent variable in a selected condition. It is considered a quasi-experimental design because it evaluated nonrandomized selection (Trochim, 2020).

Research Site

The study was conducted in Dalubhasaan ng Lunsod ng San Pablo, a city college in San Pablo City, Laguna. Dalubhasaan ng Lunsod ng San Pablo Integrated School is its extension for the Senior High School students.

Respondents

The participants of the study were all the population of the Grade 11 senior high school students in DLSP Integrated School. Four classes from different

strands taking Introduction to Research with approximately 10-30 students were given pre-test/needs assessment and post-test.

Data Gathering Procedure

In gathering the data, a pre-test was conducted to assess the needs of the Grade 11 Senior High School students. Four classes from different strands taking *Introduction to Research* with approximately 10-30 students were given a pre-test/needs assessment. After the deliberation of the results, the researcher conceptualized an infographic specifically designed to help students in their research subjects.

According to the pre-test result, out of 78 senior high school students in DLSP Integrated School, 48 students answered that they did not like research as a subject. And 94% of the students responded that they do not wish to learn more about research.

The Research Infographic was posted in four classrooms of four sections (target learners) for a 2-3 weeks period. The post-test that includes reciprocal questions to the pre-test, to see if there has been a significant change to the perception and performance of the target learners, was given as a form of evaluation.

Target-learners are expected to understand and analyze the steps in writing a research paper using the ISD module. Consequently, they should be able to produce a research paper as a creative output of their learning. The paper requirement will be graded based on content completion (50%) organization of content presentation (30%) and writing mechanics – grammar, punctuation, syntax, and plagiarism (20%), with a total of 100%.

Instrumentation

The researcher used a survey type instrument to assess the knowledge, perception, and the target learners' chosen media form to learn the steps in making a research paper. Moreover, based on the data gathered through the needs assessment, the researcher conceptualized an infographic specifically designed to help students in their research subjects.

The infographics were posted in four classrooms of four sections (target learners) for a 2-3 weeks period. Their teachers told target learners that they could freely consult the infographic whenever they felt the need to learn/ re-learn the steps in writing the research paper—making the infographic/ISD readily available to the target learners carried out a more accessible route in achieving the target objectives.

The Research Infographics were posted on the upper left and upper right of the front wall facing the students inside their classrooms to remind them constantly of the presence of a guide in doing research. A post-test was conducted to know if there has been a significant change in the perception and performance of the target-learners.

Statistical Analysis

McNemar's test is utilized to analyze the data in this study. The McNemar's test is used to compare pretest-posttest study designs, before and after the treatment in which each object is used its own controller (Tinungki, 2018). If the statistical significance level (i.e., p-value) is less than .05 (i.e., $p < .05$), it is a statistically significant result and the proportion of before and after the intervention is statistically significantly different. Alternatively, if it is $p > .05$, it does not have a statistically significant result. The proportion of before and after the intervention is not statistically different (McNemar's test using SPSS Statistics, n.d).

Ethical Considerations

For the ethical consideration, the researcher communicated and sought permission to the Principal in the delivery of the pre-test and post-test, interview, and observations to be conducted during the posting and the posting of the ISD material on all classrooms of grade 11 students. All students were advised that their participation was voluntary. The students were instructed that the questionnaire is anonymous, and as a result, no one will trace their comments back to them.

RESULTS AND DISCUSSION

The researcher aims to develop a mechanism that will help the students in their research subject. A needs assessment was administered to seventy-eight (78) Grade 11 students. The first question of the pre-test, "Is this your first time to take a Research Course/Subject?" gathered fifty-four (54) *"Yes"* and twenty-four (24) *"No,"* because 'Practical Research 1'is included in DepEd's (2013) K to 12 Basic Education Curriculum for Senior High School for the Grade 11 curriculum. All participants were exposed to the ISD module for two weeks, and seventy-one (71) students out of seventy-eight (78) affirmed that the Research Infographic gave them an introduction to research. Based on the output of the McNemar's

test, there was a statistically significant difference in the proportion of pre-test and post-test after the intervention of the Research Infographic, p=.004.

The second pre-test question, "Prior to having a research subject in class, do you have an idea of what research is or what are the steps in making a research paper?" accumulated thirty (30) *"Yes"* and forty-eight (48) *"No."* An improvement in the target learners' idea in steps of making a research paper pre-test and post-test was determined because the p-value is .000. Therefore, there is a significant difference in the students' knowledge in the steps in making a research paper.

If the McNemar's test result is less than .05, it is statistically significant. Moreover, the third question in the pre-test and post-test that targeted the participants' perception about research is not statistically significant with a data of p=.106. Thus, even with the ISD module, the target learners still did not like research as a subject in school.

Though the target learners did not like research as a subject, they still want to learn more about research after viewing the ISD module with the pre- and post-intervention of p = .017, which is statistically significant.

The creation of the Research Infographic was based on the pre-test. 44% of the respondents opted to learn the steps in making a research paper through infographic/posters. The infographic was designed with a simple but catchy interface that sufficed in developing the target learners' interest in research.

CONCLUSIONS

The majority of the target-learners responded that it is their first time to take a Research Course/Subject. It suggests that most are not acquainted with research before having a research class. The two-week exposure to the Research Infographic ISD module that provided instruction of "Steps in Making a Research Paper" introduced the students to research, with a statistically significant difference of p=.004. The result proves that Research Infographic is an effective mechanism that assists the target-learners in doing research.

There is a great significant difference in the target learners' ideas in steps in making a research paper. The Research Infographic's holistic approach that can be applied in the daily learning of research as a subject improved the participants' knowledge in research, which resulted in a p-value of .000.

Nonetheless, nothing has changed, statistically, in the students' perception of research. The ISD Module did not make a difference in their perception of research since they still did not like research as a subject in school. They do not

like it for reasons such as it is difficult, it is stressful to do, and it takes a lot of time as indicated reasons in their answers to the questionnaire. But even though the target learners did not like research as a subject, they still want to learn more about research after viewing the ISD module with the pre- and post-intervention of p = .017.

Some of the target learners' generalizations suggested that there is nothing to improve to the ISD module because it is what they need to learn about research. It is informative and easy to understand.

As for the performance evaluation, all four research instructors have seen positive effects in the final rating of their research output. Their research output garnered 85%- 93% score as an average rating. Due to the confidentiality of the information, the researcher was not given a copy of the results.

TRANSLATIONAL RESEARCH

The Research Infographic ISD module has provided instruction of "Steps in Making a Research Paper" in a holistic approach since it proved to stimulate learner's interest in making a research paper so that they can identify and analyze the steps in writing a research paper. The Research Infographic will be presented to the agencies concerned, like DepEd, for them to re-evaluate and recognize that there are other ways in improving the instruction of research other than lectures. As planned, the Infographic should be printed in tarpaulin material in 2x3 feet size. It will be placed in classrooms so that the students can write a research paper that refers to the ten steps in writing a research paper indicated in the infographic.

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