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Development and Validation of SciLiksik for Grade 8 Students of Regional Science High School for Region VI

Janna Paula Marie T. Libuna, Friah Gayle F. Mostajo, Blessy Sairah P. Regalado, Marielle Althea G. Barrios, Vheanel Therese T. Iquiña, Dainielle C. Revestir, Mikko Jan D. Lopez, Edd

Regional Science High School for Region VI, Kalibo, Aklan

Abstract. The primary purpose of this study was to assess Junior High School students' level of content knowledge in research-making, which served as the foundation for developing 'SciLiksik', a supplementary guide material in research-making, for Grade 8 students of Regional Science High School for Region VI. A 40-item test questionnaire for level of content knowledge in research-making and a 20-item checklist questionnaire for level of acceptability were used and self-administered to gather information on the level of content knowledge and level of acceptability of the respondents. Data obtained were analyzed and assessed using frequency count, percentage, and mean. Results showed that the level of content knowledge of Grade 8 students in research-making at RSHS VI was 'Moderate'. In line with this, the most appropriate product to be developed based on the results of the study was a learning module entitled SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of RSHS VI. The developed SciLiksik was then evaluated with a 'Very Highly Acceptable' level of acceptability in terms of content, coherence and clarity, appeal to the target audience, functionality, and its overall mean findings. This concludes that SciLiksik highly satisfied the criteria for a profound and high-quality resource that can be used by students and teachers in the teaching-learning process and in developing actual research.

Key words: Content Knowledge, Acceptability, Research-making, Junior High School, Supplementary Guide Material.

Introduction

Article XIV of the Philippine Constitution (1987) states that the major thrust of Philippine

Science Education is to supply society with scientifically-literate citizens and promote scientific researches and inventions.

In Republic Act No. 2067 or Science Act of 1958, science research is promoted and encouraged in the country as an effective tool for enhancing science and technology (S&T), as well as research and development (R&D), for national advancement. Research is a necessary component of science. As defined by Glazunov (2012), it is a scientific or critical investigation aimed at discovering and interpreting facts. It is a universal concept that is required for man's survival and progress in life and a key factor in enhancing quality education (Salde & Mamaoag, 2021).

Although students have a favorable understanding of research, their attitude toward the field is rather poor. In the study of Lin-Siegler, et al. (2016), they discovered that students had difficulty conceptualizing their roles in this subject and that there was a disconnect between students' opinions of themselves and scientists because participants believed that success in science could only be attained through talent. Therefore, greater emphasis in the curriculum should be made on these aspects to boost student interest in research (Bangalan & Hipona, 2020).

Novak (2002) emphasized, as cited by Balan (2015), that a greater comprehension of scientific ideas requires active participation in meaningful learning, exploring how new concepts connect to past knowledge, and the application of new conceptual understanding to explain encountered experiences. Recently, in the study of Palines & Ortega-Dela Cruz (2021), they concluded that although the results of the scientific literacy skills in terms of writing scientific research papers were good, there are still several parts of the research paper to consider especially for the grade 7 students, such as the results and discussions, summary, conclusion, recommendation, literature references, and much of the introduction. With these data in hand, the researchers noticed a pattern in which students who are exposed to Research at a younger age have an easier time navigating the subject than those who are only exposed to it later in life, causing them to struggle or have poorer proficiency in the field.

Presently, researchers have discovered from Molina's study entitled Research Competencies of STEM Students in a State College in Zamboanga last 2021 that students generally approach their research methods curriculum with dread, attributable to the subject's vast and abstract nature. By incorporating a variety of student-driven, content-specific coursework that promotes active learning in comparison to a typical research methods course, and by including a range of student choices in the research methodology curriculum, researchers incorporated an active learning approach while also fostering an environment that nurtured students' intrinsic motivation to learn the material. These findings contributed to the growth of research, indicating that students learn best when they are actively involved in the process (Stoloff, et al., 2012) and are most intrinsically motivated when they have a sense of control over their learning (Jang, 2008).

In view of the preceding indicators, the main purpose of the study was to equip students with the knowledge necessary to do a competent and effective research. This implied that their knowledge may considerably influence their performance in higher-level research studies in which they undertook as part of the school curriculum. Hence, this study aimed to provide a

Supplemental Guide Material in the process of Research-making for Grade 8 students of Regional Science High School for Region VI.

Statement of the Problem

The primary purpose of this study was to assess Junior High School students' level of content knowledge in research-making, which served as the foundation for developing 'SciLiksik', a supplementary guide material in research-making, for Grade 8 students of Regional Science High School for Region VI.

Specifically, the study aimed to answer the following questions:

1. What is the level of content knowledge of RSHS VI Junior High School students in terms of making research?
2. What learning module can be created based on the result of the study?
3. What is the level of acceptability of the SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of RSHS VI in terms of:

a) content;

b) coherence and clarity;

c) appeal to the target audience; and

d) functionality

Methodology

Research Design

The research design for this study was Research and Development (R&D) design.

Participants

The respondents of this study were 50 bonafide Grade 8 students, 10 students from each of the five homeroom sections of the Regional Science High School for Region VI, S.Y. 2021-2022. The respondents of the study were selected using the purposive sampling method.

Correspondingly, the acceptability of SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of RSHS VI was determined by the validation of Grade 8 students and the Grade 8 Research teachers. Hence, the validators of this study were the 50 bonafide Grade 8 student-respondents and their two Research subject teachers.

Data Gathering Instrument

Research questionnaires formulated by the researchers were used as the primary data collecting tool in this study. The survey questionnaire was composed of three (3) parts. Part I identified the sociodemographic profile of the respondents. Next, Part II was the Level of Content Knowledge Questionnaire. And lastly, Part III was the Level of Acceptability Rating Checklist.

Sociodemographic Profile Questionnaire. This part was used to determine the personal information of the respondents such as their name, which they can optionally provide, and their class section.

Level of Content Knowledge Questionnaire. Questions in this part of the questionnaire were

provided through a multiple-choice test consisting of 40 items. Items were separated into the 15 parts of a research proposal such as the Title, Introduction, Statement of the Problem, Hypothesis, Conceptual Framework, Significance of the Study, Scope and Limitations, Proposed Experimental Design, Flowchart of Procedures, Proposed Materials, Proposed Procedures, Data Collection and Analysis, Interpreting Results and Drawing Conclusions, Risk and Safety, and References.

The level of content knowledge was measured from the collected mean total scores categorized using the following scale:

Score	Description
32.01 – 40.00	Very High
24.01 – 32.00	High
16.01 – 24.00	Moderate
8.01 – 16.00	Low
0.00 – 8.00	Very Low

Level of Acceptability Rating Checklist. This part was a rating checklist with the purpose of determining the level of acceptability of SciLiksik as a supplemental guide material in research-making for Grade 8 students in terms of content, coherence and clarity, appeal to the target audience, and functionality. A rating checklist as the data collecting tool for the level of acceptability was deemed suitable for the study because rating scale questionnaires quantifiably bracket varying opinions of a group of people through a set range.

In the construct of the criteria for the level of acceptability of the supplemental guide material, five (5) statements in affirmative were provided for each criterion, such as the content, coherence and clarity, appeal to the target audience, and functionality. In total, there were 20 statements provided and a comment or suggestion box available right after the checklist for the respondent's specific recommendations for the improvement of the supplemental guide material.

The questionnaire was responded using a 5-point Likert Scale:

Scaling	Description
5	Strongly Agree
4	Agree
3	Neutral
2	Disagree
1	Strongly Disagree

The mean was arbitrarily categorized as follows:

Mean	Description
4.21 – 5.00	Very Highly Acceptable
3.41 – 4.20	Highly Acceptable
2.61 – 3.40	Acceptable
1.81 – 2.60	Less Acceptable
1.00 – 1.80	Least Acceptable

Results and Discussions

Level of Content Knowledge of Grade 8 Students in Research-Making

Table 1 indicates the level of content knowledge of Grade 8 students in research-making at Regional Science High School for Region VI.

Consequently, the data gathered from the questionnaire presented through a multiple-choice test consisting of 40 items demonstrated the level of content knowledge of grade 8 students in the 15 parts of a research proposal, such as the Title, Introduction, Statement of the Problem, Hypothesis, Conceptual Framework, Significance of the Study, Scope and Limitations, Proposed Experimental Design, Flowchart of Procedures, Proposed Materials, Proposed Procedures, Data Collection and Analysis, Interpreting Results and Drawing Conclusions, Risk and Safety Disposal Plan, and References/Appendices.

The results in Table 1 appear to suggest that Grade 8 students at Regional Science High School for Region VI have a 'Moderate' level of content knowledge in research-making, which equates to a mean of T=20.68 for Grade 8 student-respondents.

Based on the results, the grade 8 students of Regional Science High School for Region VI have varying levels of content knowledge across the 15 parts of a research proposal. In other words, the level of content knowledge possessed by the students differed considerably, was diversified, and covered a broad spectrum.

Generally, the data obtained in Table 1 indicates that students struggle the most and are the weakest, resulting in the lowest mean scores, in the areas of Proposed Experimental Design (M=0.56), Interpreting Results and Drawing Conclusion/s (M=0.84), and Proposed Materials (M=1.12), varying from 'Very Low' to 'Low' respectively.

It suggests that students have difficulty comprehending experimental designs relevant to their research. Experimental design is one of the several types of scientific inquiry used to determine the cause-and-effect relationship between two or more variables and to estimate the degree of the effect. The results also revealed that they are weak in Interpreting Results and Drawing Conclusion/s, as well as composing the Proposed Materials since these components require detailed comprehension.

As per the study conducted by Palines & Ortega-Dela Cruz (2021), considering Science Investigatory Project (SIP) employs an experimental research design, teachers stressed that students should be thoroughly informed of the study's categorization of variables as well as the treatment that will be used (CRD or RCBD). Similarly, the findings are consistent with the exploratory study by Nurlaelah, et al. (2020), which intended to assess research skills and investigate authentic research abilities that can enhance students' research skills. It was discovered that the actual research abilities of students were severely inadequate and lacking, based on components of research skills such as those falling into the 'Very Low' to 'Low' range. The average rubric score was 1, indicating that the students were less skilled.

On the contrary, students demonstrated a 'High' level of content knowledge of the Hypothesis (M=1.34), the Significance of the Study (M=1.3), the Flowchart of Procedures (M=1.58), and the Data Collection and Analysis (M=1.88) parts of the research. And the findings revealed that the students with a 'Very High' level of content knowledge are especially notable in the area of References/Appendices (M=2.1).

This signifies that student-respondents claimed they could create and establish those parts, and it demonstrated that those were their strengths since they recognized and grasped them in class. It further highlighted that the instances were readily available or taught efficiently during the learners' prior education, hence it is figured that those would be the most uncomplicated parts for them. Relatively, this implies in Aparecio's (2018) mixed-method analysis study that mentoring greatly supported this strong student performance in hypothesis formulation, literature evaluation, data analysis, and data presentation.

Seven out of the fifteen parts were found to have 'Moderate' levels of content knowledge in the research-making of the students. These parts comprise the Title (M=1.12), Introduction (M=1.76), Statement of the Problem (M=1), Conceptual Framework (M=1.3), Scope and Limitations (M=1.46), and Proposed Procedures (M=1.58), and Risk and Safety Disposal Plan (M=1.74). Comparing the aforenamed means with the overall level of content knowledge mean, they are both classified into one description, which is 'Moderate'.

Overall, these findings are in accordance with the study of Farin, et al. (2021), wherein respondents were evaluated to be 'moderately capable' of constructing a research proposal and report. Relatively, in the study of Palines & Ortega-Dela Cruz (2021), which utilized the causal-comparative research design across the grade levels of Junior High School, the overall mean was described as 'Good', which is equivalent to this study's 'Moderate' scale. Hence, although the results of the scientific literacy skills in terms of writing a scientific research paper were good, there are various components of the research paper that must be appropriately considered. Furthermore, it only demonstrates that the students' assessments align with the researcher's evaluations.

Table 1. Mean Results of Level of Content Knowledge of Grade 8 Students in Research-Making at RSHS VI

Parts of the Content Knowledge	Mean	Description
Title	1.12	Moderate
Introduction	1.76	Moderate
Statement of the Problem	1.00	Moderate
Hypothesis	1.34	High
Conceptual Framework	1.30	Moderate
Significance of the Study	1.30	High
Scope and Limitations	1.46	Moderate
Proposed Experimental Design	0.56	Very Low
Flowchart of Procedures	1.58	High
Proposed Materials	1.12	Low
Proposed Procedures	1.58	Moderate
Data Collection and Analysis	1.88	High
Interpreting Results and Drawing Conclusion/s	0.84	Low
Risk Safety and Disposal Plan	1.74	Moderate
References/Appendices	2.10	Very High
Total	**20.68**	**Moderate**

SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of Regional Science High School for Region VI

After the deliberate evaluation and formulation, the production of the SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of RSHS VI was conducted. SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of RSHS VI is a learning material that introduces the theory and practice of research in educational contexts. It includes the fifteen parts of a research paper which are the Title, Introduction, Statement of the Problem, Hypothesis, Conceptual Framework, Significance of the Study, Scope and Limitations, Proposed Experimental Design, Flowchart of Procedures, Proposed Materials, Proposed Procedures, Data Collection and Analysis, Interpreting Results and Drawing conclusions, Risk and Safety Disposal Plan, and References and Appendices.

In this learning material, the topics are presented according to the order it appears in the research plan so that the learner can trace the connections between each part and organize the information presented. Each chapter discusses one topic and has the following components: Overview, Objectives, Pre-Test, Learning Activities, Practice Tasks, and Post-Test. The objectives in each topic consist of competencies that the learners should acquire after reading the material and should gain an understanding of how to construct their own research study. The activities in each chapter include the Pre-Test, Practice Tasks, and Post-Test.

Table 2. Content and Description of the Various Segments of SciLiksik: A Supplementary Research-Making Guide Material for Grade 8 Students of RSHS VI

Content	Description
Cover Page	The cover page of the supplementary guide SciLiksik will be the first figure presented. Being the very first page of the supplementary guide, the cover is a big factor to the first impression that potential readers have of the material. It consists of general information and imagery that illustrates what the material is all about. Through these elements, it paints a picture and creates an image to the reader of what SciLiksik revolves around and what content can be expected inside, gauging their level of interest for the subject. The central focus of the Cover page depicts a boy in search of something, holding books, papers, and a mobile phone inscribed with the word 'SciLiksik'. The boy (learners) is using the devices (SciLiksik) he is holding as his guide to what he is searching for. This presents the main concept of the supplementary guide material which urges the learners to "dare to know more" instead of simply settling with the knowledge handed to them through mandated textbooks. Through these materials, he is equipped with abundant help towards his goal. The title SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of RSHS VI is also displayed on this part of the material. The title is a play on two words such as 'Science' and 'Saliksik' combined together. Science is used to emphasize that this learning material will cater to science high school students, and Saliksik being the Filipino

	word for 'research', is merged with it. Hence, the title gives a general view that this learning module is dedicated to the research studies of science high school students, specifically from RSHS VI. The material mainly used the color green, specifically shades of pastel green, for the layout of the Cover page as well as its symbols and icons per chapter. Low wavelength colors, which promote placidity and calmness, relatively improve efficiency and focus. Green is an excellent color for keeping long-term concentration and focus, making it a good choice for textbooks and other learning materials – the complete opposite to red, which is seen as stimulating and exciting. The tables, borders for symbols, and page layouts utilizes circles and beveled edges to produce a softer structure which provides a sense of safety, as opposed to angular and rectangular shapes — the wicked teeth of an animal, the rigid shape of a rock, which are signifiers of danger. Students are therefore more likely to pay more attention to smooth, rounded shapes. The sloppy and almost hand-drawn quality of the art style used in the illustrations and symbols per chapter, which gives it a general sense of coziness and authenticity, represents the fact that the material was made by students who also went through research-making as they encountered it and relates to the learners' struggles as well. Illustrations and summaries attached to the Learning Activities per chapter were included as visual aids and to promote emotional and cognitive interest.
Overview Page	The overview provides context for how each component of the research paper is arranged and presented in this instructional material. In addition, the overview includes the components of the learning material, including an overview, objectives, pre-test, learning activities, practice tasks, and a post-test. This instructional resource presents these components with their definitions and related icons for easy identification.
Chapter 1: Title	The first chapter of the SciLiksik deals with the title of a research paper. This chapter detailed the definition and types of titles that should be used. Samples of these types of titles were also provided to help readers better understand and differentiate between them. A checklist and a list of criteria of a good title were also provided for users to look over and use as a reference when developing or writing their title. Finally, in the chapter's conclusion, a practice activity and a post-test modeled after the pre-test were designed to examine and analyze their progress. A five-item test based on the chapter's contents was included in the pre-test and post-test. On the other hand, the practice task consisted of three items in which they were required to create effective and relevant titles for each set of information supplied. The information given was retrieved from the past studies of the researchers.
Chapter 2: Introduction	This chapter discussed the Introduction of the study. It serves multiple purposes which include presenting the background to the study, introducing the topic and objective, and providing an overview of the

	paper. Chapter 2 aimed to discuss the stages in writing the Introduction, differentiate the parts of an Introduction, and assess and identify the parts of an Introduction, including the Introduction of sample studies provided. The Learning Activities include the discussion and definition of the Introduction and its parts as well as multiple sample studies to help learners recognize the pattern and steps in writing the Introduction. A Pre- and Post-test were also included at the beginning and end of the chapter respectively to assess the prior and gained knowledge of students. A practice activity, which required students to identify which part of the Introduction the content of the word box belonged to, was also developed to assess their knowledge about the parts of the Introduction. The information used in the activity were retrieved from sample studies included in the Learning Activities.
Chapter 3: Statement of the Problem	In Chapter 3 of SciLiksik, the Statement of the Problem is discussed. The ultimate goal of this chapter was to transform the researcher's generalized problem into a well-defined predicament that can be resolved through the conduct of the scientific method. This chapter of the learning material aimed to discuss the two parts of the Statement of the Problem (General and Specific); assess, identify, and differentiate the General and Specific Statements of the Problem; and to improve one's capability to write a Statement of the Problem. This chapter is heavily assisted by sample studies in order for learners to see the pattern in the structure of formulating a Statement of the Problem based on actual research papers. Chapter 3 consisted of a Pre- and Post-test wherein the students' prior knowledge was discovered before utilizing the supplementary guide and was further tested after using it, assessing whether the learners have improved their understanding of the topic through the chapter's Learning Activities. The Practice Task in this chapter was developed to challenge them in identifying which statements of the problem are in their General or Specific format.
Chapter 4: Hypothesis	In Chapter 4 of SciLiksik, the Hypothesis is discussed. The principal statements where the relationship of the present variables in a study were dissected and studied here. This chapter of the learning material aimed to discuss how to formulate a Hypothesis statement, differentiate and write Null and Alternative Hypotheses, assess and identify the parts of a Hypothesis, with the aid of some sample studies' Hypotheses provided and broken down to its key structure and components, and ultimately teach the learners how to write the Hypothesis of their own research plan. Chapter 4 consists of a Pre- and Post-test wherein the prior knowledge was discovered before utilizing the supplementary guide and was further tested after using it, assessing whether the learners have improved their understanding of the topic through the chapter's Learning Activities. The Practice Task in this chapter was formulated in engaging them to formulate Null and Alternative Hypotheses simply through the presence of a study's research question or specific statement of the

	problem.
Chapter 5: Conceptual Framework	The Conceptual Framework is covered in Chapter 5 of the SciLiksik module. The purpose of this chapter is to allow the researcher to comprehend the foundations of a conceptual framework, which is a textual or visual description of an expected relationship between variables, gaining an understanding of the distinctions that exist among the many kinds of variables. The purpose of this section of the instructional material was to determine the components that were to be incorporated into the construction of the conceptual framework. More specifically, the chapter was figured to select the various types of variables, such as the independent, dependent, and antecedent variables. Considering the sample studies that have been presented, the objective of this section is to examine the process involved in construction to analyze and identify the components of the conceptual framework clearly. This acts as a road map for the researcher's study, enabling them to visualize it by defining the relevant variables and their potential relationships. A pre-test and a post-test were included in Chapter 5. The pre-test assessed the students' prior knowledge before they used the supplemental guide, and the post-test evaluated whether or not the students' understanding of the topic had improved as a result of participating in the chapter's Learning Activities. The Practice Task that is presented in this chapter was designed to introduce students to a challenge in terms of recognizing and placing potential variables in the appropriate sequence, as was outlined in the explanation of the conceptual framework.
Chapter 6: Significance of the Study	The Chapter 6 of SciLiksik discussed the Significance of the Study, which is the specific contributions that the study will make after its completion. After going through this chapter, the students were expected to identify the content of the Significance of the Study and arrange the order of beneficiaries and contribution. This chapter identified possible beneficiaries of a research study and the corresponding contribution they will benefit from. Format and tenses used were also included and derived from excerpts of sample studies provided as examples. The Practice Task of this chapter required the students to arrange the beneficiaries of the study from who will benefit the most to the least.
Chapter 7: Scope and Limitations	In Chapter 7 of SciLiksik, the Scope and Limitations is discussed. This chapter defined the topic and boundaries of the research problem to be investigated. The purpose of this chapter is to educate the students in writing the Scope and Limitations; assess and identify the parts of the Scope and Limitations of the sample studies provided; and to improve one's capability to write the Scope and Limitations. The scope, as well as the distinction between limitation and delimitations, were outlined in this chapter. Excerpts from numerous sample studies were also used to provide a much clearer guide in creating the Scope and Limitations. Chapter 7 consisted of a Pre- and Post-test to determine the students' prior knowledge before using the supplementary guide, as well as a test

	afterward to determine whether the learners' grasp of the topic had improved as a result of the chapter's Learning Activities. The Practice Task in this chapter was created to help learners improve their knowledge of defining the study's Scope and Limitations by answering guide questions that can assist them in formulating the section.
Chapter 8: Proposed Experimental Design	The Proposed Experimental Design was discussed in this chapter. This generally states the variables that will be studied, how they will be studied, as well as their expected relationship together. This chapter's objectives are identifying the different experimental designs and choosing the accurate experimental design for your study. The chapter mainly focused on the widely used Experimental Designs which are the Completely Randomized Design, Randomized Block Design, Randomized Controlled Trial, and the Latin Square Design. Definitions and examples were provided per experimental design. Tables with detailed labels were also included to help students compare their study with the examples given and therefore choose the right experimental design for their study. For the Practice Tasks, the researchers made a three-item activity designed to test the students' skills in identifying common experimental designs.
Chapter 9: Flowchart of Procedures	In Chapter 9 of SciLiksik, the Flowchart of Procedures is discussed. This chapter identified complex and excessive steps in a procedure, in order to make a standardized flowchart. This chapter of the learning material aimed to identify the parts needed to make a Flowchart; understand the importance of a Procedural Flowchart; and to discuss on how to organize a Flowchart. This chapter discussed how flowcharts are constructed as well as provided examples of how a flowchart should appear. Chapter 9 consisted of a Pre- and Post-test to determine the students' prior knowledge before using the supplementary guide, as well as a test afterward to evaluate whether the learners' grasp of the topic had improved as a result of the chapter's Learning Activities. This chapter's Practice Task was developed to test the students' ability to organize a flowchart, which includes an activity that involves arranging the Procedural Flowchart of a sample study.
Chapter 10: Proposed Materials	In Chapter 10 of SciLiksik, the Proposed Materials is discussed. This chapter identified and provided a precise description of what will be used in an experiment. This chapter of the learning material aimed to identify what materials or descriptions a researcher should include in writing the Proposed Materials; assess and identify the Proposed Materials needed for the researcher's study; and teach the learner on how to write their own Proposed Materials. The chapter provided tips on what to include when formulating the Proposed Materials, as well as words and phrases used to describe instruments or equipment that are essential in conducting a study. It also included a number of sample studies to serve as a guide for developing the Proposed Materials. Chapter 10 consisted of a Pre- and Post-test to determine the students' prior

	knowledge before using the supplementary guide, as well as a follow-up test to determine whether the learners' grasp of the topic had improved as a result of the chapter's Learning Activities. The Practice Task in this chapter was developed to broaden the student's knowledge in writing the proposed materials by answering the questions related to this chapter.
Chapter 11: Proposed Procedures	The Proposed Procedures are addressed in Chapter 11 of SciLiksik. The end purpose of this chapter was to engage researchers with how the precise strategies for data collecting and analysis would be formulated to attain the research aim that will be sequentially executed. This chapter addresses all of the facets that have to be integrated into the creation of the Proposed Procedure in order to illustrate the procedure that is involved in constructing one. Since a scientific procedure is one in which a particular activity related to the study is carried out systematically in order to complete the research objectives, there are things to consider in order for the procedure to be carried out effectively; as a result, this chapter provides pointers to keep in mind. This chapter is substantially supported by sample studies so that students may observe the structure of Proposed Procedures based on genuine research papers. Chapter 11 consisted of a Pre- and Post-test in which the students' prior knowledge was assessed preceding the use of the supplemental guide and after using it to see whether the chapter's Learning Activities enhanced the students' comprehension of the topic. The purpose of the Practice Task in this chapter is to develop competence to undertake research on the processes utilized in this study and construct a thorough narrative approach for each of the following procedures.
Chapter 12: Data Collection and Analysis	The most important element of the research process, regardless of the subject of study is the Chapter 12 of the SciLiksik, the Data Collection and Analysis. This chapter was divided into two parts: the Data Collection Tool and Data Analysis. The basic and common tools in data collection were discussed in the first part as well as a guide for the readers to help them choose the appropriate data collecting tool/s for their study. This guide showed the type of data collecting tool, when and how to use them. In the second part, as quantitative research is most common within grade 8 students, the researchers focused on that and discussed the two most commonly used quantitative data analysis methods: descriptive and inferential. The experimental method was also tackled as usually studies in the lower grade levels are experimental. A guide for selecting an appropriate statistical tool was also provided. With these they are expected to identify the methods of collecting data and determine the appropriate data analysis techniques for a given method of data collection. In the chapter's conclusion, a practice activity and a post-test modeled after the pre-test were designed to examine and analyze their progress. A five-item test based on the chapter's contents was included in the pre-test and post-test. On the other hand, the practice task consisted of three items in which they were required to identify the

	data collection tool/s and data analysis that may be appropriate for the given research study based on their hypothesis. The information given was also retrieved from the past studies of the researchers.
Chapter 13: Interpreting Results and Drawing Conclusion/s	This chapter defined results, its function, its elements, and other important terms for interpreting results. This chapter also included an explanation of the meaning of conclusion as well as tips for crafting a conclusion. In addition, for a better understanding on how to interpret a result and draw a conclusion, a visual illustration was provided in this section, using the results and conclusions from the researchers' previous studies. After going through this section, the students were expected to get an understanding of what the results and conclusions are and their significance, learn how to interpret results and draw conclusions from the findings of the study, and practice interpreting results and drawing conclusions. To assess the students' comprehension of this section, they were given a practice task requiring them to provide a complete explanation of the findings by filling in the blanks with the appropriate terminology.
Chapter 14: Risk and Safety Disposal Plan	In Chapter 14 of SciLiksik, the Risk and Safety Disposal Plan is discussed. This chapter identified and provided the potential risk and safety precautions required for the conduct of the study. The purpose of this chapter was to discuss the Risk and Safety Disposal Plan and its components; assess, identify, and differentiate Biological Safety Levels allowed in school-required research studies; and teach the learner how to write the Risk and Safety Disposal Plan part of their research proposal. This part of the research proposal widely varies for each study, hence multiple sample studies were provided in order to familiarize the learners. Chapter 14 consists of a Pre- and Post-test wherein the students' prior knowledge was discovered before utilizing the supplementary guide and was further tested after using it, assessing whether the learners have improved their understanding of the topic through the chapter's Learning Activities. The Practice Task in this chapter was developed to utilize the learners' memorization skills in remembering the different primary components that make up the Risk and Safety Disposal Plan.
Chapter 15: References/Appendices	This chapter of SciLiksik offered a description and explanation of the last section of a research paper, which is often formatted in APA style. In this chapter, examples of an APA reference page, formatting various types of citations, and the specific format that APA standards demand for creating references were shown to further illustrate the format. Certain free websites where students may read research papers were also included in this section. In addition, the definition and purpose of 'Appendices' in a research paper were provided. Students were also given some general guidelines on how to construct appendices for a better comprehension. In this chapter, students were expected to have understanding of what a reference is and its significance, learn how to

	properly cite a variety of sources using the American Psychological Association's (APA) reference style, and practice referencing a variety of sources and know what to do when confronted with a challenging source. Students were given a practice assignment requiring them to spot the inaccuracy in a reference and rewrite it in order to assess their expertise on the topic.
Answer Key Section	This comprises all the answer keys to the supplied activities such as Practice Tasks, the Pre- and Post-tests whereby the students' prior knowledge was identified before using the supplemental guide and was further tested after using it, analyzing if the learners have improved their comprehension of the topic through the chapter's Learning Activities. This is intended to boost students' comprehension of the presented topics so that they are more likely to acquire them all. There are also activities in which students must provide their own answers; hence, students are tasked to give varying responses. In addition to providing the student with more practice, it may be highly beneficial for the student to carefully compare their own work to the answer keys and consider the implications of any differences.
References	This contains all the online sites, books, and journal articles in APA format where the researchers have cited words and ideas to formulate the module. This was done to acknowledge other people's perspectives, ideas, theories, about Research itself, allows readers to independently check information by visiting source materials and importantly avoid plagiarism. By providing a References section in the learning material, the credibility of the supplementary guide is safeguarded and assured.
Authors' Page	This section provided the researchers' names as well as their contribution in making SciLiksik. Aside from the fundamental issues of honesty, ethics, and integrity, appropriately naming the authors allows general readers and scientists to know the appropriate attribution of the publication to a particular author. Without proper attribution, it is unclear who is responsible for the work that has been published.

Level of Acceptability of the SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of Regional Science High School for Region VI

Table 3 below presents the level of acceptability of the SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of RSHS VI according to its specific criteria.

The results show that among the criteria, 'Appeal to the Target Audience' and 'Coherence and Clarity' have the highest rating with a mean of M=4.72 among validators with a 'Very Highly Acceptable' level of acceptability. Followed by the 'Functionality' (M=4.70), and 'Content' (M=4.58) which were all remarked as 'Very Highly Acceptable'.

In terms of Content, the level is 'Very Highly Acceptable', which indicates that the information provided within the supplemental learning material adhered to credible data, correct citations, proper formatting and structure, a systematic and concise discussion, and

appropriate visual assistance to the learning activities provided. The additional knowledge imparted by the guide material deemed research-making an easier transaction, bridging lessons that are usually complicated or a struggle to understand, through its sample studies paired with step-by-step explanations and a thorough breakdown of each part.

This finding parallels the study of Astuti, et al. (2018) which pointed out that in producing a scientifically-based modular instruction, a set of planned learning experiences must be designed and arranged systematically in order for students to acquire science process skills and learn specific lessons. Relatively, the findings also mirror Molina's (2021) study, stating that incorporating a variety of student-driven and content-specific learning material fosters an environment that nurtures students' intrinsic motivation and satisfaction to learn the material.

In terms of Coherence and Clarity, the level is 'Very Highly Acceptable', which implies the validators found the material followed proper grammatical use and structure and that the lessons, instructions, and activities of the material were communicative and easy-to-follow. This also implies that the provision of information is clear, relevant, and is organized in a systematic order. This finding is congruent with the study of Jonas & Chwo (2010) which showed that for supplementary materials to be effective in individual learning, they should use language fit within the level of target learners, and should include a logical and smooth flow of ideas within a topic and from topic to topic.

In terms of Appeal to the Target Audience, the level is 'Very Highly Acceptable' which suggests that the supplemental guide material, as well as the tips and advice found inside, were more relatable and easier to follow among grade 8 students. This also implies that the material provided a clear approach for constructing research plans that can minimize teacher-student misunderstandings. Magbanua (2018) found similar findings during the conduct of an assessment in self-guiding worksheets. He concluded that self-guiding worksheets assist teachers not only in focusing on the subject matter but also in the teaching and learning process. The technique also directed the teacher-researcher to concentrate on the progress and needs of the children.

The last criterion is Functionality, which is described as 'Very Highly Acceptable', implying that student- and teacher-evaluators agree that the learning material served its intended purpose as an instructional tool, providing additional knowledge about research-making that can be applied as one progresses beyond eighth grade. The finding corroborates Jonas & Chwo's (2010) assertion that using various resources to complement current textbooks increases strategy utilization, which in turn enhances students' learning results.

When seen as a whole, the validators strongly agreed that the supplemental guide's level of acceptability is rated as 'Very Highly Acceptable' (M=4.68). This indicates that the validators were very satisfied with the module's quality. With this level of acceptability, SciLiksik proved to have exceptionally served its purpose of being a supplementary guide material that provides additional aid in knowledge and application for research-making to Grade 8 students of RSHS VI.

As stated by one of the validators in the comment/suggestion section of the administered survey questionnaire, "I read the guide material and I was familiar with some of the lessons since I learned it during the previous quarter, but the guide material further helped me

understand those lessons and added more information. Overall, I learned a lot, the illustrations were fun, and I'm looking forward to using it in the future!" This finding supports Estremera's (2017) work that the module should be satisfactory in terms of content, style, and instruction, as well as meet the quality and applicability standards established for instructional material production. It also backs up Espinar & Ballado's (2017) research on the requirement for content validation and acceptability of worktexts in order to determine their usability.

The overall evaluation results of both the teacher- and student-validators were congruent with the previous study on material development based on Nunan's (1989) suggestions which were also stated in Rogayan & Dollete's study in 2019, wherein good materials should: (1) be clearly linked to the curriculum they serve; (2) be authentic in terms of text and task; (3) stimulate interaction; (4) allow learners to focus on the formal aspect of the language; (5) encourage learners to develop skills in learning how to learn; and (6) encourage learners to apply their developing language skills to the world beyond the classroom.

Table 3. Level of Acceptability of the SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of RSHS VI according to its specific criteria

Criteria	Mean	Description
A. Content		
Overall	4.58	Very Highly Acceptable
B. Coherence and Clarity		
Overall	4.72	Very Highly Acceptable
C. Appeal to the Target Audience		
Overall	4.72	Very Highly Acceptable
D. Functionality		
Overall	4.70	Very Highly Acceptable
Overall Mean	**4.68**	**Very Highly Acceptable**

Conclusions

Based on the findings of the study stated above, the following conclusions were drawn:

1. Obtained from the questionnaire results developed through a multiple-choice, the level of content knowledge of Grade 8 students in research-making at Regional Science High School for Region VI was considered as 'Moderate'. The findings revealed that students' research literacy was regarded as adequate. It is attributable to the fact that the students have somewhat prior knowledge in research-making. With modest self-efficacy, the majority of students consider they can conduct scientific research tasks. While the results of the scientific literacy skills in writing scientific research papers were favorable, various parts of the research paper must be addressed. It also implies that students who are introduced to Research from a relatively young age have a better chance of navigating the field than those who are only exposed to it later, prompting them to underperform or have poorer competency in the subject. Hence, it is definitely compelled to provide supplemental educational activities that promote scientific thinking and process capabilities, which may

influence a student's attitude toward research-making. Compared to a student-led exploration, the results showed the need for structure-guided materials that will significantly improve their skills and approach to research-making. In order to be intellectually engaged, students must have the requisite content knowledge inferred by the undertaking.

2. SciLiksik: A Supplementary Guide Material in Research-Making for Grade 8 Students of Regional Science High School for Region VI was created based on the results of the study. It is a learning material developed from the results of the pre-assessment questionnaire administered by the researchers, determining the parts of the research proposal in which the students were skilled or less skilled in. Through this, the researchers are able to distinguish which parts will need more attention to be discussed to aid the students' inefficiency under the specific topic(s). It includes the fifteen parts of a research proposal which are the Title, Introduction, Statement of the Problem, Hypothesis, Conceptual Framework, Significance of the Study, Scope and Limitations, Proposed Experimental Design, Flowchart of Procedures, Proposed Materials, Proposed Procedures, Data Collection and Analysis, Interpreting Results and Drawing conclusions, Risk and Safety Disposal Plan, and References and Appendices. In this learning material, the topics are presented according to the order it appears in the research plan in order for the learners to track the connections between each part and organize the information presented. Each chapter discusses one topic and has the following components: Overview, Objectives, Pre-Test, Learning Activities, Practice Task, and Post-Test. The objectives in each topic consist of competencies that the learners should be able to acquire after reading the material and should gain an understanding of how to construct their own research plan. The activities in each chapter include a Pre-Test, Practice Task, and Post-Test.

3. The developed SciLiksik was judged to be 'Very Highly Acceptable' by both teachers and students, based on the accumulated overall mean findings. The learning module received high regard in terms of content, coherence and clarity, appeal to the target audience, and functionality. This means that the supplementary guide material for RSHS VI Grade 8 students satisfied the criteria for a good and high-quality resource that can be used by students and teachers in the teaching-learning process and in developing a research. The material is concise, credible, and provides a specific step-by-step explanation and breakdown of how to write the parts of a research proposal, along with sample studies for better conceptualization and run-through of the lessons. Aside from that, it supplies engaging activities and visual aids for the learners' cognitive stimulation. Generally, it follows a system of proper format and coherent structure, laying out an efficient and effective method for establishing a research plan that avoids construction errors. Furthermore, these findings established that the material has imparted practical skills and information for doing research that may be used as one progresses beyond the eighth grade. According to the teacher-validators who gave good comments in the generated supplemental guide material, implementing the SciLiksik may be advantageous and essential for students who are new to research and still have difficulty understanding it. With the implications aforementioned, SciLiksik exceptionally serves its purpose as an avenue of additional information in writing a research proposal.

Recommendations

Based on the findings and conclusions, the following recommendations were suggested:

1. To the students, it is recommended that they seek more resources regarding research-making to comprehend better and understand the scientific literacy skills necessary for research. This will enable students to operate independently and aim higher in the realm of scientific research making.

To the research teachers, it is recommended that their character and teaching approach be compatible with the demands of the students. To improve the efficiency of teaching Research as a subject, it is proposed that teachers acquire new skills. As allowing science/research teachers to attend seminars or workshops will improve their teaching abilities and keep them up to date on relevant methodological approaches in the long run. Furthermore, increased availability of teachers during consultation times is a crucial outlet for providing feedback and help to students who have difficulties with their specified research directions. Differentiated instruction should be regarded as well. This will assist students in better relating to the learning activities and therefore maximizing their learning experiences.

To the parents, it is recommended that they provide their children with comprehensive guidance and assistance. It is strongly advised that they supply their child with all of their needed resources in line with their educational undertakings. They may ensure that their children's educational goals are met by providing the necessary yields.

To the school administrators, it is recommended that they develop specific guidelines for the usage of all accessible educational tools, which will be a tremendous benefit to the students in terms of setting directions. Creating a research learning module will aid in the standardization of the lesson across grade levels. Furthermore, building links through collaboration with Local Government Units (LGUs) and non-governmental organizations will aid in the identification of alternative sources of funding. This will help with training and purchasing laboratory equipment that students may use to strengthen their scientific literacy skills.

To the future researchers, it is recommended that they recognize that, in an age where the world is constantly bombarded with vast amounts of information, the development of scientific literacy skills is more significant than ever. This, in turn, emphasizes the need for researchers to develop scientific literacy in science and research education. A well-educated population in science is better able to deal with many of the difficulties that it faces. As an outcome, individuals will be able to make more informed decisions and make better judgments, which will impact their quality of life further than the personal and societal. This, in essence, leads to the nation’s overall improvement.

2. To the students, it is recommended that they employ the SciLiksik Supplemental Guide Material in their education in order to acquire information throughout the process of research-making, create competence in this field, and allot time to study it as well. In light of the fact that the teachings that are often included in the resources that are made available by schools have a broad range of topics, specific information on how to do research ought to be offered in its own capacity for the purpose of maximizing efficiency. It is strongly implied that each component of the research proposal is understood independently; as a

consequence, students are strongly encouraged to participate in the activities that are offered by the material. This will further boost the level of information that they possess. Researchers are able to implement an active learning strategy while also establishing an atmosphere that supports students' intrinsic motivation to study the material if they include a range of student options in the curriculum and incorporate a variety of student-driven, content-specific coursework that encourages active learning. Students will have a greater capacity for independent functioning as a direct result of this, which will enable them to pursue academic excellence to a greater degree, particularly in the realm of scientific research. Students at the Junior High School level should make use of SciLiksik because, through this learning material, they will be able to correlate what they are learning to the required specifications of the students in research progress by utilizing a comprehensive resource.

To the research teachers, it is recommended to utilize this learning material as supplementary material in educating students about research-making. The instructional materials used by instructors are not restricted to textbooks alone; teachers may choose to use SciLiksik as a supplementary teaching resource in research-making since it is designed to correspond to the level of topic knowledge of Junior High School students in research-making, preparing them sufficiently for research in subsequent years. Specifically, the research teachers in the Junior High School department should employ SciLiksik as they may connect what they are teaching to actual needs of the students in research development using a profound and student-centered resource.

To the parents, it is recommended to familiarize themselves with this supplementary guide so that they can provide their children with any assistance they require to better grasp the contents of the module, as there is a need for students to advance their technological, pedagogical, and content knowledge— parents should be able to support them in this endeavor. Familiarizing themselves with the said supplementary guide may also ensure that their children's educational goals are accomplished by offering the essential yields, as well as the parents' support for their child and Research itself. This in turn will help the children be more engaged in the learning process, and parent-child bonding may transpire.

To the school administrators, it is recommended that they enact their support to this supplementary guide through various forms of involvement. School Administrator involvement is recognized as a key factor in the extent to which this supplementary guide or any type of supplementary learning material from other sources is developed, revised, and successfully distributed to the students. Administrators have the ability to create and support supplementary materials that serve information and methodical tool of higher vocational education's management that outlines the basis of scientific knowledge on research-making, in accordance with their standards of higher vocational education, objectives of the educational curriculum, and includes tools to manage the process of this knowledge's cognition. Following the suggestions above will help ensure that students receive a fair, high-quality experience in their research-making.

To the future researchers, it is recommended to conduct further research related to 'SciLiksik' as a supplementary guide material, and to have further evaluation for the improvement of the said material. It is also suggested that they may develop another supplementary guide material involving research, as there are only limited resources

available. The utilization and production of supplementary materials is encouraged in order to fill in perceived gaps within the prescribed instructional materials and in order to provide additional approaches to motivate students.

3. To the students, it is recommended for them to engage in exploring credible resources in research-making, instead of relying on one material only. That they should invest in identifying their preferred learning preference, be it learning by themselves, learning with peers, learning under the guidance of instructors, or learning through instructional materials in order to maximize their capability in the comprehensive undertaking of research-making.

To the research teachers, it is recommended that they consider using supplemental learning materials in the learning process of research-making as a part of developing effective teaching strategies, especially the use of step-by-step or breakdown of explanations for each part of the research proposal alongside sample studies and engaging coursework or learning activities. Most importantly, it is highly suggested that teachers become more involved with their students' journey in research-making, taking the time to be knowledgeable of their learning preferences, weaknesses to improve and focus on, and strengths to nurture and polish.

To the parents, it is recommended that they provide means for students to access different types of learning materials designed to help students, which have been circulating and have received positive reactions. Providing access to resources will help the children be more engaged in the learning process. Lack of resources to accommodate their inquisitiveness will hinder and discourage them from partaking in the education.

To the school administrators, it is recommended that they create learning initiatives such as using SciLiksik as a prototype in developing learning materials for other core courses in Senior High School. School Administrators, as the people at the helm, play a vital role in the scientific community and in fostering a science research culture at the basic education level. May it be within their initiative to incorporate a variety of student-driven and content-specific learning material that cultivates an environment wherein students' intrinsic motivation and satisfaction to learn are given primary focus or attention to.

To the future researchers, it is recommended to conduct a pre-test-post-test quasi-experimental research design to assess the effectiveness of the supplemental guide material quantitatively. This will help assess potential problems in utilization as well as further validate its effectiveness. Future Researchers may also dive deeper into the realm of instructional materials where they can elaborate on the construction of different kinds of research proposals per topic category of the research.

References

1. Aparecio, M. B. M. (2018). Mentoring, Self-Efficacy and Performance in Conducting Investigatory Projects: A Mixed-Method Analysis. Asia Pacific Journal of Contemporary Education and Communication Technology, 4(2), 65–76. https://doi.org/10.25275/apjcectv4i2edu7

2. Astuti, I. A. D., Putra, I. Y., & Bhakti B. Y. (2018). Developing Practicum Module of Particle Dynamics Based on Scientific Methods to Improve Students' Science Process Skills. Scientiae Educatia. 7. 183. 10.24235/sc.educatia.v7i2.2513.

3. Balan, H. R. (2015). Using Peer Mentoring-Buddy System as an Intervention Strategy to Enhance Science Research Skills. *Journal of Multidisciplinary Studies*, *4*(1). https://doi.org/10.7828/jmds.v4i1.850

4. Bangalan, R. C. & Hipona, J. B. (2020). Senior High Students' Attitude and Barriers In Conducting A Research: A Platform To Enhance Scientific Pedagogical Learning.

5. Espinar, J. T. & Ballado, R. S. (2017). "Content Validity and Acceptability of a Developed Worktext in Basic Mathematics 2." Asia Pacific Journal of Multidisciplinary Research 5 (1): 72-84.

6. Estremera, M. I. (2017). "Acceptability and Quality Level of the Developed Reading Module Entitled 'Lead to Learn, Save the World': An Instructional Material Used for SY 2014-2015 to SY 2015-2016." Journal of Literature, Language and Linguistics 40: 31-7.

7. Farin, E. N., Brade, W. M., & Garcia, C. E. (2021). Research Capabilities of Public Secondary School Teachers in the Schools Division of Zambales. Journal of World Englishes and Educational Practices, 3(7), 26–35. https://doi.org/10.32996/jweep.2021.3.7.3

8. Glazunov, N. M. (2012). Foundations of scientific research. https://arxiv.org/pdf/1212.1651.pdf.

9. Jang, H. (2008). Supporting students' motivation, engagement, and learning during an uninteresting activity. *Journal of Educational Psychology*, *100*(4), 798–811. https://doi.org/10.1037/a0012841

10. Jonas, A. & Chwo, G. (2010). Adopting supplementary materials to enhance listening and speaking strategy used by Taiwanese college EFL learners. *Great Light Journal (59),* 25-41.

11. Lin-Siegler, X., Ahn, J. N., & Chen, J. (2016). Even Einstein struggled: Effects of learning about great scientists' struggles on high school students' motivation to learn science. Journal of Educational Psychology, 108(3), 314–328. https://doi.org/10.1037/edu0000092

12. Magbanua, M. A. U. (2018). Self-guiding worksheets: strategy in improving students' performance in trigonometry. *International Journal of Innovation in Science and Mathematics*, *6*(6), 201-203.

13. Molina, R. (2021). Research Competencies of Science, Technology, Engineering and Mathematics (STEM) Students in a State College in Zamboanga City, Philippines. *Eurasian Journal of Educational Research (EJER),* (94).

14. Nunan, D. (1989). Designing Tasks for the Communicative Classroom. Cambridge: Cambridge University Press.

15. Nurlaelah, I., Widodo, A., Redjeki, S., & Rahman, T. (2020). Student's research skills in middle school of Kuningan district. Journal of Physics: Conference Series, 1521, 042105. https://doi.org/10.1088/1742-6596/1521/4/042105

16. Palines, K. M. E. & Ortega-Dela Cruz, R. A. (2021). Facilitating factors of scientific

literacy skills development among junior high school students. LUMAT: International Journal on Math, Science and Technology Education, 9(1), 546–569. https://doi.org/10.31129/LUMAT.9.1.1520

17. Republic of the Philippines. (1987). Constitution of the Republic of the Philippines. https://www.officialgazette.gov.ph/constitutions/1987-constitution/
18. Republic of the Philippines. (2017). *Republic Act No. 2067: "Science Act of 1958."* https://www.dost.gov.ph/phocadownload/Downloads/Resources/RA/REPUBLIC%20ACT%20No.%202067%20Science%20Act%20of%201958.pdf
19. Rogayan, D. & Dollete, L. (2019). Development and Validation of Physical Science Workbook for Senior High School. Science Education International 30(4), 284-290. https://doi.org/10.33828/sei.v30.i4.5
20. Salde, G. K. & Mamaoag, N. (2021). Research Capability of Senior High School Teachers in Bayugan City Division: Basis for Capability-Building Program. Asian Journal Of Research In Education And Social Sciences, 3(2), 144-152.
21. Stoloff, M. L., Curtis, N. A., Rodgers, M., Brewster, J., & McCarthy, M. A. (2012). Characteristics of Successful Undergraduate Psychology Programs. Teaching of Psychology, 39(2), 91–99. https://doi.org/10.1177/009862831243772