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PERSPECTIVES

Training Research Skills for High School Students in Vietnam: A Case Study

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ABSTRACT
This article presents a case study in Vietnam where a course on research skills was taught to outstanding high school students who are preparing to study abroad. The course is structured with training sessions that focus on key ideas in scientific research, reading and writing skills, and research projects in which students help complete a review article. The article investigates the possibilities of integrating such a course into the Vietnamese high school system, as well as the obstacles to implementation. The course embraces promise for growth as Vietnamese parents and students become more aware of the need for research skills despite facing obstacles such as time limitations and passive learning preferences. Vietnam and SouthEast Asia is a major market for student mobility, highlighting a strong demand for international higher education. More emphasis should be placed on courses that specifically equip secondary students with research abilities and overall college readiness skills. The noted difficulties can be overcome to deliver high-quality research skills courses for high school learners.

1. INTRODUCTION

It is widely acknowledged that research skills are crucial with undergraduates due to the requirement to complete graduation theses or dissertations (Vieno et al., 2022). Nevertheless, research skills are not merely practical abilities that facilitate academic work and learning; instead, they allow students to develop critical thinking and provide means to probe into knowledge on any subject. As a result, research thinking and skills should be imparted and embraced across all educational levels.

The shift toward the 21st-century skills concept has also intensified this focus on equipping high school students with skills to navigate post-secondary education (González-Pérez & Ramírez-Montoya, 2022). In some countries, developing students' research skills in secondary levels is one of the critical goals in the educational system. For example, in Peru, the Peruvian National Curriculum of Regular Basic Education issued by the Ministry of Education in 2016 clearly stated that it is expected that students will be able to use scientific methods to inquire about a specific topic, building their knowledge (Varías-Palacios, Rogelio Angel et al., 2023).

Vietnam is among the countries with the highest number of international students in tertiary education, as reported by Acumen (2024). The analysis indicated that Vietnamese parents are making significant financial investments in early schooling to ensure their children are well-prepared for enrollment in overseas colleges. Being "college ready" is increasingly becoming the central concern of high school parents and students. In particular, research skills are crucial for students to excel in college, whether in STEM fields (Lane et al., 2020) or social science, arts, and humanities fields (Kistner et al., 2021).

While numerous studies examined the integration of academic research skills into formal educational programs (Aripin et al., 2021; Lacson & Dejos, 2022), there is a lack of research on stand-alone courses explicitly designed to

train research skills to high school students. This paper presents a case study on implementing an extracurricular class focusing on teaching students research skills. It proposes a syllabus for the course and examines the benefits and challenges of organizing such a program.

2. OVERVIEW OF THE COURSE

The course was an initiative of the Research Coach in Social Sciences (RCISS) program and IvyPrep, focusing on educating high school students, particularly those anticipating pursuing higher education overseas. RCISS is a program supporting social science researchers, particularly graduate and junior researchers, in enhancing research capabilities and publishing their work in international academic journals and advancing their academic careers in general (see Pham, 2020). Ivyprep is an educational institution providing services that help Vietnamese high school students to succeed in the US and other developed nations.

The course is divided into two main sections, including training and research projects. Table 1 presents an example of the syllabus for the training section.

Table 1. Syllabus for the training section of the research skills course for high school students

Module	Content
Module 1: Introduction to academic publishing	- Classification of Research Outputs; - Finding academic materials; - Research Evaluation: formal metrics, alternative metrics & evaluating informal research outputs; - Becoming relevant to your field.
Module 2: Basic concepts in scientific research	- Deductive and inductive reasoning; - Causation and Correlation; - Research paradigm; - Hypothesis and proposition, concept and operational definition; - Variable measurement; - Test of Significance; - Taxonomy and classification - Mediating and Moderating effects; - Theory.
Module 3: Ethics in scientific research and references & citations	- Plagiarism; - Ethics and integrity; - Citation styles; - Reference management software.
Module 4: Basic Steps in the Research Process	- Overview of the research process; - Type of research; - Developing research idea; - Research design; - Sampling and collecting data.
Module 5: Reading a scientific article	- Structure of an academic journal article; - Reading and analyzing each part of the article: Introduction, Literature review, Method, Results, Discussion.
Module 6 : Writing	- Gathering documents for literature review; - Academic writing: summarizing & paraphrasing, paragraph development; - Tools and materials in supporting academic writings.

Depending on the class, the above content can be covered in 4-10 sessions. The course material can be adapted based on the course duration. For example, if only 4 sessions can be organized, certain content may need to be condensed during in-person classes. Students have the option to see pre-recorded lectures online to compensate for the shortened sections. When scheduling a whole 10-session program is possible, we will be able to incorporate more exercises throughout the class. Regarding the form of learning, it can be done offline or online via Zoom depending on the actual circumstance.

In the research project section, students will be organized into teams of 1-3 persons. Each team will either be allocated a research topic or have the option to suggest one. A lecturer/coach will be appointed to provide guidance through the project, as presented in Figure 1.

3. AN EXAMPLE OF IMPLEMENTING A RESEARCH SKILLS COURSE FOR HIGH SCHOOL STUDENTS

The class consisted of five students from the 11th and 12th grades, all of whom participated in the training sessions together. The training was conducted online via Zoom once per week. This process spanned two months, comprising five sessions, each lasting approximately three hours. The content outlined above was systematically taught and discussed during these sessions.

Following each session, students were assigned homework designed to reinforce the skills they had acquired. These assignments were structured to mirror the sequential steps of conducting research. For instance, in the first session, students were required to search for and collect ten academic papers related to their chosen topic and identify specific indicators for assessing the quality of these papers, aligning with the content covered in the initial session.

In the research project phase, the students were divided into two groups and given one week to collaboratively determine a research topic. Before finalizing their selection, they met with their supervisor to discuss and refine their proposed topic. The research project proceeded over the course of two months. As the program had been designed with a structured framework outlining each stage of the research process - including the role of supervisors - the project progressed smoothly, despite the fact that the supervisors were not the same instructors who had conducted the initial training sessions.

Ultimately, two final research papers were completed and uploaded to preprint servers. Given that some notable findings from the students' research were discussed in a previous section, they are not reiterated here to ensure the students' identities remain confidential.

Since the primary objective was not to assess the program's effectiveness, only general observations were noted. First, all students performed well on their assignments, indicating a strong grasp of the lesson content. Second, the structured research process proved highly effective, as it guided students in progressively developing their papers despite their initial unfamiliarity with academic writing. In terms of tangible outcomes, each student successfully co-authored their first research paper, which was uploaded to a preprint server - an experience that closely mirrors standard academic publishing practices.

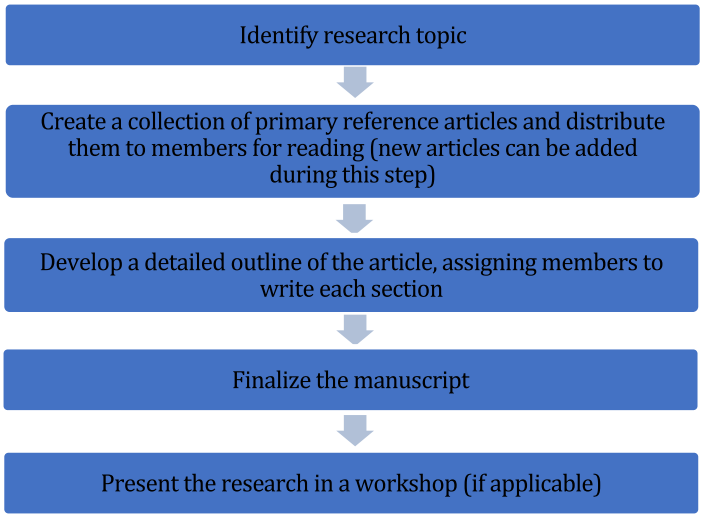

Figure 1. Research Project Implementation Process

We will publish the draft of the paper to working papers/preprint platforms including OSF, SSRN, and ResearchGate, which are indexed by Google Scholar. See Dang (2019), Nguyen et al., (2023), Nguyen et al. (n.d.); Tran (2019) for some notable examples of our students' works. The project section employed the project-based learning approach to teaching students research skills. According to Varías-Palacios, Rogelio Angel et al. (2023), this is among five widespread strategies to promote research skills in secondary education, alongside argumentative essays, application of web 3.0 tools, curricular and didactic planning and problem-based learning.

This exercise does not necessitate students to carry out a complete research project, involving tasks like collecting and analyzing data. However, it helps students improve skills like reading scientific articles, summarizing and synthesizing information, constructing arguments, and academic writing. Because the course is an extracurricular class with time constraints, assisting them in writing a whole essay would be more beneficial than undertaking an entire research project that demands significant time and work.

The project also yielded additional benefits. Since most students in the program were expected to study abroad, doing scholarly work might improve their curriculum vitae. Close collaboration between our team of educators and students over a prolonged time enhances mutual understanding, leading to more solid and genuine letters of recommendation.

4. FACTORS CONTRIBUTING TO THE SUCCESS OF THE COURSE

The most important factor that helps drive the success of the course is parents' and students' awareness of the significance of scientific research. This is partly due to the fact that numerous colleges have integrated scientific research experience and achievements as criteria in the entrance and scholarship selection process (Shi, 2021). Many researchers observed that parents nowadays value high-level skills like research skills, as they believe it will help their children join the high-level skills workforce (Blanden et al., 2023).

Not only awareness of parents, parental background also influences the concern for their children's research skill. Parents with a high level of education are more inclined to invest in quality education for their children. Additionally, studies have shown that parents who have studied abroad are more likely to invest in courses that prepare their children for college, such as developing research skills (Roksa & Deutschlander, 2018).

Another favorable factor contributing to the effective completion of the course is that the majority of students displayed a solid proficiency in English writing, which they frequently practiced when preparing for IELTS or SAT exams.

5. BARRIERS TO ACHIEVING DESIRED OUTCOMES

Students struggled to fully participate in training sessions and make progress in research projects partly due to their hectic schedules since they still had to attend regular classes and perform a lot of extra classes and extra work in preparation for study abroad. Additionally, improving IELTS and SAT scores is a more tangible objective, so it is reasonable that they devote more effort to it.

Another obstacle is that students have a passive learning style, which has long been a concern among Asian students in general and Vietnamese students in particular (Lewis, 2002). However, scientific inquiry requires researchers to be exploratory, inventive, and active. When guiding students working on research projects, we as lecturers always faced the difficult decision of whether to let them work through problems on their own or to step in and help them finish them quickly. Ideally, the lecturer should act as a mentor or a reviewer, allowing learners to develop self-regulation and problem-solving abilities. Completing the task hastily may prevent students from acquiring valuable experience. However, in certain situations, allowing students to act independently could lead to delays in the schedule.

Thirdly, some parents have unrealistic expectations for their children's performance in the course, such as expecting their work to be published in international journals. This results from a common misconception that their child's scholarship application will be more attractive and competitive if the child has published scientific work. In reality, scholarship evaluation committees are well-versed in application strategies and can recognize the true worth of students' work, regardless of whether it has been published.

6. CONCLUSION

A course on introducing research skills to high school students has the potential to be expanded and implemented in the educational landscape of Vietnam. A course as such covers essential skills aligned with the 21st-century skill agenda, such as academic writing, proficient use of English, critical thinking, collaboration, and information literacy. Regarding the learning experience, it offers learners chances to evoke their innate curiosity for knowledge.

To the best of the authors' knowledge, no such course has been formally integrated into Vietnam's high school curriculum. However, its implementation aligns well with recent educational reforms that emphasize integrated curricula and multidisciplinary approaches (Ministry of Education and Training, 2018). Given its focus on skill development rather than domain-specific knowledge, the course allows for the incorporation of diverse subject areas, thereby promoting interdisciplinary learning. It should be noted, however, that the proposed course is designed as an extracurricular program; therefore, this study serves as a recommendation for curriculum and policy developers rather than a formal curricular proposal.

This paper presents a case study on instructing high school students research skills and suggests a comprehensive curriculum for the course. The suggested program provides basic knowledge applicable across several fields of study. This curriculum can be used by researchers, teachers, and service providers to organize similar courses. We are willing to share our experiences with teams looking to launch similar programs.

Our findings show that both students and teachers encountered similar challenges, such as time limitations, educational methods, lack of enthusiasm, and inadequate knowledge for scientific research. These challenges can be overcome by adjusting the teaching technique appropriately and dedicating more time to consulting with parents.

This study has certain limitations. As its primary objective was to introduce the course curriculum and conceptual framework, no specific criteria were established to assess its effectiveness or evaluate students' perceptions and comprehension. Additionally, the findings presented are largely based on observations; empirical evidence on the barriers and contributing factors influencing the course's success is needed to substantiate the authors' claims. Future research should address these gaps to provide a more comprehensive evaluation.

Vietnam and SouthEast Asia is a major market for student mobility, highlighting a strong demand for international higher education. More emphasis should be placed on courses that specifically equip secondary students with research abilities and overall college preparedness skills.

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