GUIDE ON THE SIDE: MENTORING PRACTICES OF HIGH SCHOOL RESEARCH ADVISERS

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ABSTRACT – *This qualitative study aimed to describe the mentoring practices among high school research advisers in two public schools in Bukidnon. A total of seven high school research advisers were interviewed and the data collected were analyzed through Colaizzi's method. Four themes emerged namely: Building research skills among students, Providing opportunities to showcase research outputs, Mentoring as Guide on the Side and Professional Enhancement. These practices were found to be effective in guiding the students in the conduct and successfully finishing their research investigations. As such, there is a need to strengthen mentoring practices in schools to continuously develop teachers who are capable of becoming research teachers and advisers, provide avenues for students to present their research findings, and support training for advisers to equip themselves with the trends in research.*

Keywords: Mentoring practices, research advisers, mentees, qualitative research

1. INTRODUCTION

Research is an integral part of the holistic development of high school learners. As students' progress in the educational ladder, it is imperative to acquire the fundamental knowledge and skills in conducting research investigations to further enhance them in preparation for college life where research studies are a staple in different disciplines. Every Science, Technology, Engineering, and Mathematics (STEM) curriculum must include research. This is evidenced by the growing emphasis on research education in international science curricula[1]. Students who participate in scientific research are afforded the opportunity to observe the real-world applications of theoretical concepts that they have been exposed to in the classroom. Furthermore, they can see how the experimental and analytical work carried out in research settings builds upon the information that they have acquired in the academic setting [2]. A major factor in the effectiveness of research teaching is how competent the teacher is assigned to mentor the students. In a study conducted by Rio et al [3] participants perceived that their ability to teach research was unproductive due to excessive time in teaching preparations and their incompetence, insufficient logistical and infrastructure support especially limited internet connectivity, and inadequate materials.

Research teachers are tasked as advisers as student-mentees journey from inception to completion of the project as well as during competitions at both local and international levels. Sanchez and Rosaroso [4] claimed that the research journey is affected by the teachers' prior background. They are seen to be instrumental in the process, as they instill basic research skills in high school investigators, and develop the science character which is needed for them to engage in innovations in science and technology (S&T). Research advisers play a pivotal role in shaping the student-mentees; hence, the researcher felt the need to study the mentoring practices of high school research advisers in order to identify the techniques they employ in advising their students and excel in competitions both local and abroad and other factors that may contribute in the success of the research studies.

2. MATERIALS AND METHODS

A qualitative study involving seven (7) high school research advisers from two public schools was conducted. The informant was high school teachers who have mentored student researchers for at least 5 years and served as a coach of an award-winning student project at the regional or national level.

The sole research instrument used in this study is the semi-structured interview protocol. The interview task protocol was used to elicit the practices of teachers' teaching research. The in-depth nature of an intensive interview fosters eliciting each participant's interpretation of his or her experience. The interviewer seeks to understand the topic and the interview participant has the relevant experiences to shed light on it. Thus, the interviewer's questions asked the participant to describe and reflect upon his or her experiences as a research adviser. The data collected were analyzed using Collaizzi's methods. This qualitative method allows the researchers to reveal the essence of the experiences of the informants through emerging themes. To ensure the rigor of the study, member-checking was done by giving back to the respondents and checking if their responses were interpreted correctly. By citing the significant statements of the informants, the authenticity and validity of data are guaranteed.

3. RESULTS AND DISCUSSION

Four (4) major themes emerged from the responses of the informants. The themes were formed based on the clustering of codes from the participants' answers. These themes put essence on the transcripts of interviews made as to mentoring practices of high school research advisers.

Theme 1: Building of Research Skills

Based on informants' responses, effective mentoring basically includes teaching fundamental concepts of the research process among the students. According to one of the informants, it starts as early as Grade 7, students are exposed to research through the development of integrated skills and as the year level progresses, hands-on activities, research and proposal writing until the implementation of the project are conducted.

"I do course lectures with them and give them examples of research" (P2)

"They are exposed to the different concepts coupled with hands-on activities, and scientific attitude" (P5)

"I ensure that students are provided with proper training on the basic research skills" (P6)

Having a good background in research is an advantage as students are made aware of the steps in the scientific method and can follow the systematic conduct of research investigations. Aside from conceptual understanding, a scientific attitude is also developed by effective mentors. This is essential so students may be able to appreciate the importance of doing research in an ethical manner and to adhere research protocols as well. Authentic research experiences can empower students to pursue research opportunities as undergraduates and to consider careers in science, technology, engineering, and mathematics [5].

Theme 2: Providing opportunities to showcase research outputs

Students need an avenue to present the results of their research undertakings. As a terminal requirement of the subject in research, the student-researchers are required to present in front of a panel of evaluators or in a much-organized school-based event such as during the science fair or research festival.

"Successful research is when they had conducted at the same time defended in a colloquium in school, regional or national levels" (P1)

"They are able to present orally and defend their research output to panelists" (P3)

"I require the students to participate in contests like science fair" (P4)

By organizing events like these, students are able to showcase the research results of their investigations and disseminate to a larger audience the significant findings of the study. Moreover, schools choose the best projects and join in regional and national science fair competitions. Exposure to these activities boosts the confidence of students and at the same time serves as an inspiration to fellow students to also do research.

According to Chilingaryan and Gorbatenko [6] participation in academic competitions enhances students' learning motivation, and when students work together in groups or teams to compete, they develop collaboration and cooperation skills which are crucial in learning and work environments.

Theme 3: Mentor as Guide on the Side

According to the informants, an effective research mentor is one who is willing to guide the students from conception to completion of the research undertaking. The key role of the mentors is to guide and pave the way for students to see a clearer picture of how their studies are shaping up and how they can be improved along the way.

"I keep on asking for updates from them and give them both positive and negative feedback for them to improve" (P1)

"I do constant monitoring because scientific investigations do not deal only with students' activity but also what they do in between" (P2)

"I extend my time after office hours to give training on research writing" (P4)

"I follow up on them and go to fieldwork when needed" (P7)

Research mentors are highly regarded by their mentees. They are seen as a source of knowledge, a wealth of skills, and the epitome of successful researchers. However, aside from these, it is equally important for effective mentors to have the ability to inspire students to do well in research.

This result is in consonance with the finding of Lucas at al., [7] that students come up with a good research output because of the following key areas: guidance from someone who is passionate about research as represented by their research critique or research teacher,

Theme 4: Professional Enhancement

To ensure that mentors are updated and kept abreast of the developments in the field and to foster collaboration, continual enhancement activities are practiced.

"I join seminars about the trends in my field of expertise especially about the conduct of different research designs so I can share it to my students" (P5)

"For me to be updated, I read recent journals and share it to my co-advisers, my students are also trained to filter and use only reliable sources of information" (P6)

"Yes, there are instances that I feel that my knowledge is limited, when this happens, I often consult other teachers and experts from other schools whom I know are well-versed with the topic. I collaborate with him/her" (P7)

As research mentors, one must upgrade oneself to keep abreast of the latest developments in the field. As such, journal readings, and attendance at conferences are necessary as additional inputs in guiding the students in research undertakings. Additionally, not all science teachers are specialized in all sub-disciplines, hence, when needed according to an informant, seeking advice from co-teachers is necessary. Research as dynamic as it is also needs to be cascaded correctly to students, hence, the research mentors also need to be up to date with the essential skills and trends in doing research studies.

Effective professional development enhances the teacher's skills and adds value to the school as a whole supports active learning, collaboration with peers, and models best practices in the field [8].

Overall, the results contribute to the growing body of work that could possibly suggest practices to consider in training effective research mentors and help novice teachers learn more about their practices and how to further improve and enhance their research and mentoring capabilities.

4. CONCLUSIONS

Becoming a research mentor entails practices that would ensure the success of student-mentees in conducting research investigations. The generated themes suggest that for one to become an effective mentor, one must be able to build the research skills of the students through in-depth lectures and hands-on activities, provide opportunities to showcase the results of the scientific investigations through attendance in science fair competitions, seminars, and research colloquiums, and serve as a guide on the side, constantly doing a follow-up on the progress of students and giving feedbacks for the betterment of the research outputs and finally, research mentor continuously upgrade themselves through professional enhancement activities. The role of the mentor is indispensable as they not only teach and act as guides but also help students realize their full potential so that they may be able to contribute to society through engaging in research investigations.

5. RECOMMENDATIONS

Mentoring programs for novice teachers: Seasoned research advisers need to mentor young research teachers to be able to help them be equipped with the necessary skills and share the

best practices learned throughout the years of research advising.

Institutionalize research colloquiums: The schools may consider conducting an annual event that would showcase the results of all research investigations conducted by the students, through this event, more students will be engaged and be given the opportunity to showcase their research outputs.

Strengthening the culture of research: A school with a mature research culture embraces the need to conduct research investigations and provide an avenue for students to be able to disseminate the outputs through paper presentations and publications.

Support research mentors in upskilling activities. School officials may consider giving financial aid for mentors to upgrade themselves through attendance in seminar-workshops, conferences, training, and other related activities, through this, they will be able to return to their workstations equipped with the new trends in research which they can share with their colleagues and students.

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