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Research Experiences of Undergraduate Students at a Comprehensive University

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Narrative inquiry was utilized to allow undergraduate students involved in an undergraduate research course to narrate their experiences in their research undertakings under the guidance of their respective mentors. A total of four focus groups representing the Bachelor of Arts and Letters, Bachelor of Commerce, Bachelor of Secondary Education, and Bachelor of Science in Pharmacy were interviewed. The present study describes the research experiences of a select group of undergraduate students who had defended their research outputs. The findings reveal that undergraduate students who were under competent, motivating, and supportive research mentors undertook the rigorous research process and experienced various activities and mixed feelings in the following stages: Groping, Developing, and Accomplishing. Only a few teams disseminated their outputs in refereed journals, educational conferences, and/or public poster exhibits.

The aim of education, according to Whitehead (1932), is the production of active wisdom (as cited in Elliot, 1996); thus, engaging in research makes one a partner in the creation of knowledge (Shamai & Kfir, 2002). Institutions have been challenged to involve students in hands-on research experiences to enhance their learning (Merkel, 2003). For most students, hands-on experiences with their peers provide the best learning tools. Most of them conduct research by teams (Doerschuk, 2004). The essence of undergraduate research is the supportive, encouraging, and intellectual partnership among students and between students and their faculty mentor through which they apply knowledge gained in the classroom to new questions and problems. Essentially, the students become junior partners in faculty research (Merkel, 2003). Undergraduate research is important and popular for the following reasons: (a) to integrate young scholars in the community of learning; (b) to motivate undergraduates to become independent thinkers; (c) to ensure that research experience be a necessity (Merkel, 2003; Schwartz, 2005); and (d) to prepare students for graduate programs (Adamsen, Larsen, Bjerregaard, & Madsen, 2003).

In research classes, teachers promote students' learning to become scholars and develop understanding that scholarship is creating new knowledge (Wilensky, 2002). As research mentors, teachers sustain human and intellectual connection with their students in the quest for knowledge and understanding (Lopatto, 2004). Undergraduate students become collaborators and those who make significant contributions to their mentor's on-going work become co-authors of articles in refereed journals (Merkel, 2003). Merkel (2003) describes undergraduate research as a partnership between students and their mentors through which students apply knowledge gained in the classroom to explore new problems and increase intellectual capacity. According to Doerschuck (2004) and Schwartz (2003), research paves the way for young scholars to belong to a community of learning, experiencing independent thinking, teamwork, leadership, and communication as they work under the direction of a faculty member. Furthermore, Adamsen et al. (2003) shared that undergraduate research facilitates students' interest in research, leading them to have their own research projects in research-based practice. To attain the goals of undergraduate research, student researchers are engaged in consulting experts, applying for grants, presenting conference papers, writing for publications, participating in research clubs, and networking or collaborating with peer mentors or faculty mentors (Dohm & Cummings, 2002; Johnston & McCornaack, 1997: Merkel, 2003). These research activities require support, such as mentoring guidance, orientation, and training (Greene, 2005; Shakespeare, 2005); good infrastructure and resources (Gibson, 2005; Shakespeare, 2005); and the psychological, social, and political aspects of support for students' research involvement (Johnston & McCornack, 1997). Through the adequate support for their research activities, both extrinsic and intrinsic rewards/benefits are gained by the young scholars. Some of the extrinsic rewards/benefits which may be received by the undergraduate researchers include degree acquisition and recognition/award (Delatte, 2004; Katz & Coleman, 2006), and the intrinsic benefits which may be gained by them are professional and personal growth (Dohm & Cummings, 2002), self-confidence, self-esteem, and feeling of affiliation (Adamsen, Larsen, Bierregaard, & Madsen, 2003; Johnston & McCornack, 1997; Katz & Coleman, 2001), and improvement of research culture (Cohen, 2005). With the above-mentioned studies, describing the research

experiences of the undergraduate students remains imperative.

The present study describes the research experiences of a select group of undergraduate students belonging to the science, education, business, and humanities disciplines of a university offering diverse academic programs.

Method

Narrative inquiry is a qualitative research method for gathering information through storytelling, which according to Connelly and Clandinin (1990) is normally done by people who are storytelling organisms who lead storied lives. In this study, stories of such lives shall be told by the study's focus groups, and narratives of the experiences shall be organized.

Study Context

The study took place in four research classes representing the four colleges – Faculty of Pharmacy, College of Education, College of Commerce, and Faculty of Arts and Letters – of a comprehensive university. The Thesis Writing/Research Methods (a 3-unit course) classes in the colleges under study provided opportunities for students to identify and solve existing problems in the field or discipline of their study by applying qualitative, quantitative, or mixed methods methodologies. In the four colleges, hands-on research experiences for students is a requirement. Students conducted research either individually or by team and selected their respective research advisor. Two of the research advisors advised almost all the teams in their respective research classes. At the end of the term, the written research output (see Appendix A) was submitted to the research teacher and defended in a forum within the college.

Participants

The participants of the study included teams of students who were randomly selected from four research classes, each class belonging to the following curricular programs: Bachelor of Arts and Letters, Bachelor of Commerce, Bachelor of Secondary Education, and Bachelor of Science in Pharmacy. Each research team consisted of 3-5 members, except in the case of Bachelor of Arts and Letters where each student had to work individually on a topic. Only two members from each of the randomly selected teams were interviewed using a semi-structured interview guide (see Appendix B). Four focus groups representing the four curricular programs freely responded to the interviews. A total of 27 female and 8 male Filipino students with an average age of 20 years participated in the study.

Materials

The semi-structured interview guide was utilized to stimulate the respondents to reflect on their research experiences as undergraduate students of the Thesis Writing/Research Methods course and to relate their research stories. Before conducting the interview, the guide was subjected to content validation by two experienced researchers in qualitative research. These researchers examined each interview question and the question guide as a whole and made suggestions for revision. Following a revision of the interview guide, the fourth year student was interviewed using the guide to assess the clarity of the guide's items.

Procedure

Data were collected through the semi-structured interview of each focus group: five teams of two students each representing a particular curricular program except those from the Bachelor of Arts and Letters. Members of each focus group were allowed to respond collectively or individually, depending on the interview question. Each focus group was interviewed for approximately 1.5 hours, separately. These interviews were audio-taped and later transcribed.

Data Analysis

The transcripts of the interviews were organized, synthesized, and searched for common and significant patterns of behavior and ways of thinking. The data were then sorted according to categories and themes. Categories were evaluated on the basis of their homogeneity, which according to Patton (1990), is the extent to which the information belongs to a category and the extent the categories differ and/or are unique. In this study, the participants' feelings, attitudes, and behaviors were categorized based on similarities and differences. This was done by going back and forth between the data and the classification domains to verify the meaningfulness, salience, uniqueness, and accuracy of the categories and the information in them.

Results

The students under study engaged in various research activities, which led them to the fulfillment of the Thesis Writing/Research Methods course requirements. They had various experiences as they were exposed to similar steps of the research process. Almost all undergraduate students of the respondent

university had to go through these steps for completion of the Thesis Writing/Research Methods course requirements, unless they withdrew from or failed the course. In this study, the undergraduate students successfully completed their research, and their experiences during the research process were grouped into three stages: Groping Stage, Developing Stage, and Accomplishing Stage.

The Groping Stage

The Groping Stage occurred in two phases: (a) when the student researchers were getting oriented regarding the expectations and requirements of the research course and (b) when they had to search for related refereed studies to guide them in problematizing and conceptualizing their research problems. It was in this stage that insecurity, fear, and challenges were the prevalent experiences.

Experiencing insecurity and fear. Inexperienced undergraduate student researchers felt inadequate about their knowledge and skills in research and were apprehensive about their ability to fulfill the requirements of the course. At the beginning of the research undertaking, students made the following statements:

> I may not be able to meet the deadlines! There are too many of them.
>
> We need to do a lot of readings in the libraries and do a lot of paper work. Accomplishing these tasks may be in conflict with our assignments and tests in other courses.
>
> Research seeks answers to certain questions. I may not be able to do it. It may require hard work and much thinking. I never had orientation on scientific research.

These were the students' remarks despite the encouraging disposition of their respective research advisors during the course orientation in their research classes. Although their research advisors oriented them about the research purposes, course outline, requirements, grading system, and the opportunities and benefits they may gain, instead of becoming motivated, many students were apprehensive that research entails much work and hard work.

Experiencing challenges. In the second week of classes, students from the colleges under study were told by their research advisors to search for research topics from recommendations of previous studies, or to come up with new topics that are relevant and timely in the Philippines and are within their interest and capability. These topics could be original or replications. The students were challenged by their research advisors to consult refereed studies and other experts and to brainstorm with them in the selection of the research topic; afterwards, the students selected one research problem and the research advisors assisted the students in refining their topics. Published references and experts were consulted for the formulation of the research problem. These problems, according to two focus groups, enriched the advisors'/mentors' research agenda. The following are the explanations of the four focus groups on how they conceptualized their problems:

> We reviewed studies from the journals, then brainstormed with the teammates and the advisor on topics, which are the trends and issues to be addressed in society. The advisor assisted each group in choosing the topic. Before the group chose the topic, we had to show the advisor enough references to support it. We searched as many references through the internet and the libraries. Getting exposed to the materials and brainstorming broadened our perspectives on certain issues. We were eager to seek solutions to the chosen problem.
>
> Reading several previous studies stimulated our mind to frame a new research problem, but we had to revise it several times till we got the approval of our advisor. I think it took us four times to revise the title and the statement of the problem.
>
> It was challenging to have our research topics aligned with our advisors' research agenda. When we were able to do so, these easily gained their approval. In some cases, that is, after some brainstorming sessions, the research problems had to be modified to fit our abilities and the time frame for the research activities.

In the Groping Stage, as the students were venturing into a new scholarly endeavor, they were experiencing insecurity, fear, and challenges. However, according to the students, they were intellectually and morally supported by their research advisors, other experts in their major fields, and their teammates. They were also closely guided by their research advisors during their formal and informal meetings.

The Developing Stage

It is in the stage of selecting and organizing the related information, selecting and applying the research methods, and gathering and treating the data that the students under study were confused, exhausted, motivated, inspired, nurtured, frustrated, and humanized.

Confusing and exhausting but motivating experiences. Selecting and organizing the related scholarly articles was difficult for the students because at times important information was too long, or the topics were new with very few related readings. The focus groups shared their confusing and exhausting, yet motivating experiences as follow:

> We had to go to other libraries to look for other related articles or studies because of the limited related articles on the Internet. We had to follow the outline given by our mentor, who regularly checks our work before our group reviews the inputs. The other teams also helped us by giving us information about some sources when they came across our topic. We also shared what we gathered in the library with the other teams when they needed them. As a result, we learned many things, which were not discussed by our mentors in our classes.

> It was tiresome to look for related studies in refereed journals because of our new topic. There were too few related readings for it. What motivated us to proceed in this endeavor was the novelty of the study and our desire to learn.

> We had a lot of related readings but we could not make up our mind in organizing the available information. Our advisors/mentors guided us, discussed and shared with us how to organize, cluster, and synthesize the important information. They corrected our work and gave us stimulating suggestions. They reminded us to cite the sources of information correctly so as to observe intellectual property rights.

Although it was difficult for most of the teams to select, categorize, and synthesize the related readings, they found it easy to present these following the format and style of the American Psychological Association (APA). According to the students, this was due to the training provided by the research advisors and the practice they had in their other courses in first year.

Inspiring and nurturing experiences. When selecting and applying research methods and sampling techniques as well as treating the research data, the teams under study were closely assisted by their research advisors, expert evaluators, and the statisticians, thereby making their tasks easier. Moreover, members of the same team contributed to the accomplishment of the tasks, sharing what they had accomplished whenever the team met. Some teams had difficulty meeting with all students who belonged to their team, but they tried to win their cooperation instead of quarreling with each other.

> We could follow the procedure well and understand what we were doing because our advisors and other consultants were approachable, meticulous, patient, supportive, competent, goal-oriented, good critics, and empowering. They love to do research very much and are very skillful. Because of their regular close follow-up and open communication with us, we were then gaining interest in it. (These remarks excluded the advisor/s of three teams who did not have enough time to meet them.)

> Our advisors and other consultants are research experts. In the case of my team, the advisor shared her collection of refereed articles which we cited in our paper. We could also borrow her research books. Also, our statistician assisted us in processing the data and guided us in interpreting the results. We learned some skills and values from these experts. They critiqued our teamwork without embarrassing us, so we tried our best to meet their standards.

> Our teammates shared openly what they knew and gave moral support to everyone in the team. At times, we shared also some information, which we had gathered, to other teams. We also had the opportunities to try by ourselves in the team doing things and applying the knowledge gained from classes.

At this stage, the students shared that they looked forward to working often with their teammates and their research advisors. They mentioned that the latter were very encouraging and helpful in facilitating the students' learning of more concepts, skills. and values in research that would lead them to the solution of their research problems.

Motivating and humanizing. There were both motivating and humanizing experiences in their gathering of data. Motivation was both intrinsic - interest in the problem and desire to acquire a degree - and extrinsic, encouraging words and support from experts and parents. Though motivating, the research task can be rather tedious and requires moral and financial support for the researcher to enable him/her to collect sufficient data. The students had to be patient, persevering, and cooperative; hence, the experience was humanizing.

> It was tedious but fascinating! It proved my understanding of what the Western mind had

> imposed as meanings of the symbols. I was excited to come up with a new thing.
>
> Our outside consultant was very much interested in the result of our work. He was as approachable as our mentor. We got tips from him; hence, we could get the data easily.
>
> Whenever we experienced difficulty, our parents consoled us and gave us words of encouragement. Aside from moral support, they also gave financial support for our respective projects.

There were those, however, who could not cope with the demands of data gathering. They complained about their frustrations when meeting some difficulties.

> We had to use the laboratory of another university because many groups in the other sections were using the facilities of our college and we were running out of time. We also had to spend much for gathering data, so we had to rely on our parents to support our project financially. This difficulty led us to be more patient and resourceful.
>
> It was difficult recording interview data and extracting responses from strangers. We had to think of ways to make them feel relaxed and we had to think of follow-up questions. This made us more flexible and caring.
>
> It is a humbling experience to adjust to the available schedule of the respondents and to be made to wait by the interviewees. Some interviews had to be postponed. But, we learned how to budget our time to cope with the schedules of classes and the interviews.

There were frustrations during the gathering of data, primarily caused by inaccessible facilities and lack of cooperation and competence of interviewees. However, these difficulties provided opportunities to develop some human values, such as humility, patience, flexibility, understanding, concern for others, time management, and resourcefulness.

The Accomplishing Stage

Towards the completion of the research projects, some students had exciting and fulfilling experiences, whereas others had frustrating yet fulfilling experiences. Although there were teams who failed to submit their completed projects on the set deadline, all were able to submit the manuscripts prior to the oral defense.

Exciting and fulfilling. Synthesizing the findings was easy because a lot of references were available for the discussion portion and many of the students were previously trained to summarize what they had read. Also, the students were excited to have reached the conclusion. In this stage, the students were happy that they had gained confidence; increased knowledge in their field; and improved research, higher thinking, and communication skills. They, then, realized that their outputs were useful.

> It was exciting to have reached the conclusion. We had long waited for it to come. We were very eager to find the solution to the problem. After synthesizing the results, we brainstormed over the conclusion and decided that one of us in the team writes the conclusion for the approval of our advisor.
>
> We were able to apply the research process and introduce new ideas, models, or techniques.
>
> We gained recognition for our work. Other experts would like to try our results or findings. Some of us had penetrated refereed journals. Our works were accepted for publication by international journals. Some of us had the chance to present our outputs in a public forum.

One team also added, “We can earn an income through our research output! In fact, we gained so much confidence with the output.”

Frustrating yet fulfilling. A few research teams experienced difficulty in formulating the conclusion because they only realized toward the end of their research projects that the solutions to the problems were still unattainable due to the lack of data or related literature to support the conclusion.

> We were done with the discussion but had to gather some more related reading before we could generalize our findings and form the conclusion. We almost cried over this.
>
> In our case, we realized only at the end that some data are missing, and so we had to set new appointments with our interviewees. We had to convince them that the interview was very necessary and urgent. Two of them refused to be interviewed because they did not have the time. We got so worried but fortunately, we had the chance to include this in the limitation. This experience, though difficult to handle, was resolved through the advice of our advisor.

> Mam, a member of our team, lost the transcripts of his interviewees. Since they could no longer be located, he had to replace them by other interviewees. We were afraid that we could not meet the deadline. But we needed to repeat the interviews because we were told by our advisor that we had to be honest with our data. Instead of making her (our teammate) fully responsible to gather more data, we helped her interview some more people.

Some teams were disappointed by the rejection of some refereed journals to publish their papers. However, they were satisfied with their outputs and the evaluation given by their teachers.

> We were quite disappointed because, despite our efforts, the evaluators seemed to disagree with our work and treated our research outputs as ordinary, not worth publishing. We are contented with the comments and suggestions given by our advisors/mentors. These led us to produce useful outputs.

In this study, two research classes had to prepare their research outputs for submission to refereed journals and presentation in a public forum. Only three of the submitted papers with the respective research advisors as co-authors were approved for publication by international refereed journals, and five teams were accepted for international paper presentations. Though the teams had the approval of their papers for presentation abroad, they were not able to present them due to financial constraint. All of these authors and presenters gained recognition during the graduation ceremony. Some received cash awards and others medals.

One class had to prepare the final report for possible oral presentation and poster exhibit within the university. A team of this class with the best thesis joined the National Research Competition for an oral presentation of their paper. Though the team did not win, they were happy about their exposure to the community of researchers.

Unfortunately, the class of one focus group was not given the opportunity to disseminate the outputs publicly in journals nor poster exhibit. Students of this class only submitted their papers to the research advisor and/or the teacher of the research class and defended them.

Discussion

The undergraduate students under study engaged in research for fulfillment of the Research Methods/Thesis Writing course requirement. As they undertook the rigorous research process, they experienced various activities and mixed feelings, which are clustered in this study in three stages: Groping, Developing, and Accomplishing. The students came to understand that research is a scholarly endeavor, which, according to Wilensky (2002), is a condition through which new knowledge is created.

In the Groping Stage of the students' research endeavor, the very start of their research undertaking, the majority felt apprehensive and fearful of the forthcoming research activities and the requirement of submission of quality research outputs; yet, they also felt challenged in their task of conceptualizing a research problem. Their insecurity may be attributed to the failure of their teachers in other courses to orient them regarding research and exposing them to research-based learning. Despite fears and apprehensions, the students were challenged by their research advisors in their research classes to review as many research studies from refereed journals within their line of interest and specialization. This was done to problematize and propose a research problem and to align their research projects with their respective research advisors's research agenda. Dunleavy (2005) posited that the research advisors provide a vision, which helps develop research projects that further the research advisor's research agenda. However, at times, it was necessary for the research advisor to adjust the project, as Cortinas, Straka, Beasley, Schneider and Machacek (1996) posited, in order to accommodate the students' abilities.

Before the approval of the problem, challenging brainstorming sessions took place among the members of a team and between the team and the research advisor to set goals, discuss topics, and set a plan in motion to help achieve the goals established by and for the students. This indicates that research mentoring is an interactive, interpersonal process that requires contributions from the research advisor and students involved as explained by Thomas, Kelly, and Back (1992). According to Wade (2004), meetings from time to time provide feedback on how things are going and where the research advisor and the students want to go. The research advisor shares with students interesting and informative research experiences (Page & Abramson, 2004), especially at the Groping Stage.

During the Developing Stage, selecting and organizing the related articles was confusing and exhausting but also motivating to the undergraduate students. In cases where there were too many related studies, students had difficulty in categorizing and synthesizing them; yet, they were motivated to do so by their research advisor, who guided, shared, discussed, and gave them feedback. In addition to their research advisor, the students' desire to learn continued to motivate them throughout the process. According to

Gray and Smith (2000) and Dunleavy (2005), a good research advisor is knowledgeable/competent, enthusiastic, approachable, patient and understanding, organized, self-confident, open, available, sensitive, caring, motivating, responsible, and a good communicator. Furthermore, Dunleavy (2005) stated that the research advisor must have a strong moral and ethical fiber. All these qualities, according to the students, were possessed by most of their advisors.

The undergraduate students had inspiring and nurturing experiences when they learned how to apply certain research methods and sampling techniques and how to treat data correctly by working closely under the assistance of the competent and encouraging research advisor, discipline experts, and statisticians. Providing undergraduate research opportunities with faculty experts is a means of developing familiarity and comfort with the scientific method and analytic process as well as a means of building skills in problem-solving and critical thinking (Abudayyeh, 2003). The students engaged in teamwork in analyzing and interpreting their data before they had their work corrected by their respective statisticians and research advisor. This opportunity enhanced their education, particularly in research, and gave them invaluable experiences in teamwork, leadership, and communication (Doerschuk, 2004).

The students also experienced mentoring relationships, which fostered their professional and personal growth. They learned the skills needed for successful completion of professional tasks and developed the confidence to try new behaviors (Dohm & Cummings, 2002) for they were allowed to have their own individuality and style (Rodts, 2005). The students' opportunity of working with the research advisor, who has the qualities, mandate, time, and resources to do high quality research, facilitated the completion of their research. As previously mentioned, the essence of undergraduate research is the supportive, encouraging, intellectual partnership between students and their research advisor and among the students as researchers through which students applied knowledge gained in the classroom to new questions and problems (Merkel, 2003).

Experiences of the students when gathering data were motivating and humanizing as well as frustrating and humanizing. As they performed this task, they were developing some human and scholarly values. Research provided opportunities for the development of knowledge, skills, and values. Thus, the critical roles of a research advisor are as a role model, advisor, promoter of scholarly values and scientific integrity, nurturer, educator of knowledge and skills, and advocate of research endeavors (Reynolds, 2005).

Support and motivation from the research advisor, experts in the field, statisticians, teammates, and parents were experienced by the greater majority of the undergraduate students under study. The students were assisted with specific aspects of their research and with the social, political, and human aspects of research involvement (see Johnston & McCormack, 1997). They learned how to interrelate, communicate, and adjust to different personalities during the Developing Stage. They also had to cooperate, not only with their teammates, but also with their research advisor and respondents as well as be patient and persevering in their work. In other studies, students benefited from working closely with the research advisor and learning research strategies from them, consulting other experts on their work, and having a supportive and stimulating community (Lundmark, 2002).

As earlier mentioned, there were frustrations in the undergraduate research students caused by the inaccessible facilities, lack of cooperation and competence of interviewees, and lack of support by some teammates who were unmotivated. These difficulties provided opportunities for them to develop some human values as they tried their best to meet the requirements of the research advisors and the set deadlines for completion and submission of the projects. According to Greene (2005), teams that can manage difficulties will bring out the best of the team environment by generating a more productive team.

In the Accomplishing Stage, it was then exciting and fulfilling for most of the teams to have reached the portion of synthesizing the results and formulating the conclusion but frustrating for others. Most had the ease of citing their references during the discussion of results or findings because of the availability of the reference materials and the guidance of their research advisor. Regular meetings of research advisors and students proved to be effective in refining the written communication and problem-solving skills of the students and in providing suggestions for possible solutions to the research problem (Cortinas, Straka, Beasley, Schneider, & Machacek, 1996). The students were happy to have arrived at the formulation of the conclusion and to have contributed new ideas, processes, or products to their fields of study and to certain sectors of society. The completion of their studies also paved the way for students to be co-authors of publications in national or international journals and conference proceedings (Abudayyeh, 2003) and co-presenters in international or national paper presentations or exhibits organized by professional organizations.

The undergraduate students who engaged actively in these research projects gained some benefits for themselves too. Such undertakings improved students' confidence; research skills; and their teamwork, communication, problem-solving and higher thinking skills; it also increased their knowledge in the field

which they are pursuing as Tell and Gates describe (as cited in Delatte, 2004). Johnston and McCormack (1997) shared that the undergraduates gained recognition through their successful conference papers and publications as well as network opportunities, which likewise were experienced by some of the undergraduate students under study.

Those who had frustrating experiences due to missing data or information from related readings and those whose works were rejected by journals or organizers of conferences for paper presentations, nevertheless, felt fulfilled because they passed the evaluation of the panelists during the oral defense of their papers.

Students who engaged in the research also had to go through the rigorous process of conceptualizing the problem; selecting, organizing, and documenting the related literature and studies; selecting the research method and sampling techniques; gathering and treating the data; generalizing the results/findings; and disseminating the research output. Challenge was one of the best things experienced by the students. When one faces challenge, he/she learns, grows, and discovers truths and himself/herself (Wade, 2004).

Good attributes of the research advisor and students and the quality of the mentoring relationship enhanced the completion of the students' research. Katz and Coleman (2001) mentioned that effective mentoring relationships were characterized by attributes such as mutual respect, caring, accessibility, compatibility, and support. Moreover, Schwartz (2003) suggested that advisors be a key link in the development of undergraduate research. These advisors can advocate for administrative support, recruit faculty to provide undergraduate research opportunities, assist in designing systems that match those opportunities with promising students, source out funding for the undergraduate researches, and assist in nurturing students through the process.

Conclusion

The findings reveal that undergraduate students - who were guided by competent, motivating, and supportive research advisors - completed the rigorous research process successfully with rich and colorful experiences. Generally, the students experienced improved thinking, research, communication, writing, presentation, and relational skills while manifesting values such as self-confidence, goal-consciousness, determination, perseverance, resourcefulness, self-discipline, passion for reading and work, open-mindedness, creativity, courage, responsibility, and concern for others. In most cases, the research was undertaken through the teamwork of peers under the mentorship of a research advisor, who is competent in the same discipline as the students and has a track record in research, and, when necessary, under the assistance of a statistician and another expert on the research topic.

At the start of the research endeavor, the undergraduate students were insecure and fearful of what they were about to undertake, but they also experienced some challenges at the early stage of their research involvement. During the information and data gathering stage up to the interpretation of data, they had mixed experiences of confusion, exhaustion, motivation, inspiration, nurture, frustration, and humanization. At the end of their research endeavor, however, they experienced fulfillment with excitement and frustration.

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APPENDIX A
Titles of Research

In Education

- From Contrived to Lived Experiences: Lessons from Students' Early Field Exposure and Immersions
- Informal Mathematics: Lessons from Underground Economy in the Philippines
- Struggles and Successes of Filipino Pre-service Science Teachers Captured from the Lens of Qualitative Inquiry
- Why go into Teaching? A Look into the Motives of Career Shifters in the Philippines
- Clientele Recognition of Library Terms and Concepts: the case of an Academic Library in the Philippines

In Arts and Letters

- Rereading the Arcana: A Pinoy Analysis of the Western Tarot
- Poetics of Male Homosexual Desire in the Selected Poems of Ronald Baytan
- Narrativization of Space in F. Sionil Jose's "Ermita: A Filipino Novel"
- Once on This Island: The Filipino Archipelagic Unconscious in NVM Gonzalez Selected Works"
- From the Fringes/ At the Margins: Constructing the Filipino in the Guinness Book of World Records"

In Commerce

- An Assessment of the Impact of Budget Deficit on the Philippine National Government External Debt
- The Patterns of the Philippine International Trade with the United States of America, European Union and Japan, 1994-2003
- The Performance of Selected Macroeconomic Variables under the Inflation Targeting Framework
- Alleviating Fiscal Deficit Through the Value Added Tax (1995-2004)
- Performance Efficiency of Selected Microfinance Organizations in Metro Manila: An Application of Data Envelopment Analysis

In Pharmacy

- Disintegration and Dissolution of Metformin Hydrochloride Tablets
- A Comparative Study of the Anti-inflammatory and Antimicrobial Activities of Averrhoa bilimbi and Averrhoa carambola (Oxalidaceae)
- Quality Control Tests: Dissolution and Assay Testing of Chlorpromazine Tablets Available in the Market
- An Assessment of the Hypoglycenic Property of the Crude Leaf Extract of Anarcadium Occidentale
- Formulation of an Ointment from the Crude Extract of Milcania cordata.

APPENDIX B
Interview Guide

1. What were your impressions of research undertakings/endeavors before you started attending the research classes?

2. What were your experiences (good and bad) in the conduct of research?
    a. Conceptualizing the problem
    (Is the problem your own choice? How was it conceptualized?)
    b. Selecting and organizing the related literature and studies
    c. Documenting the references cited
    d. Selecting the research method and sample techniques
    e. Determining the study site, sample subjects and the size of sample
    f. Gathering the data
    g. Treatment of data (analysis and interpretation)
    h. Generalizing the results

3. How did you handle your difficulties?

4. Who supported you in your research endeavors? How were you supported?

5. What has the college provided to make you succeed in your research undertaking?

6. Is the environment in your research class conducive to your completion of the research project? Why?

7. Did you gain interest in research upon your completion of your respective studies? Why?

8. How were the results of your study disseminated?

9. Were your papers published? If so, please fill out the details on the form.