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Preparing Young Researchers and Evaluators Through a Mexican Summer Apprentice Programme

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This paper presents the findings of the evaluation of a summer programme for developing evaluation and research skills in undergraduate students in Southeastern Mexico. The programme uses an apprentice approach in which undergraduate students develop an evaluation project that is part of a larger evaluation study conducted by a main researcher at a public university or research center. The programme stresses the importance for students in developing skills that allow them to conduct preliminary studies in programs serving the needs of culturally and ethnically diverse populations.

Keywords: higher education, research skills, undergraduate students, international studies

Introduction

Although there is a growing number of studies about the research itself and its nature, as well as a continuous discussion about research methodologies and the orientation of programs for preparing future scholars in countries with high scientific development, there is little research on this area in Mexico. As De Ibarrola (1987) stated, the research developed in Mexico and Spanish-speaking countries has focused primarily on the development of research skills for undergraduate and graduate students. Among the scholars working on this area are Chavoya and Rivera (2001), Medawar (1995), Moreno (2001), Martínez (1999), and Castellanos, Llivine, and Fernández (2003), who have focused their work on determining the research competencies to be developed by students participating in undergraduate and graduate programs. Few studies have been conducted in a systematic way about non-formal programs for preparing young evaluators. This is an important area of study not only for Mexico, but also for other countries, as Anderson (2001) stated that there is a need for more research about the benefits of programs or strategies designed for preparing young educational researchers.

In this paper, we present the findings of the evaluation of one of these programs—a summer programme—for developing evaluation and research skills in undergraduate students in the Southeast of Mexico. The programme uses an apprentice approach in which undergraduate students develop an evaluation project that is part of a larger evaluation study conducted by a main researcher at a public university or research center. It stresses the importance for students in developing skills that allow them to conduct preliminary studies in programs serving the needs of culturally and ethnically diverse populations.

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Scientific Summer Research Experience

The programme "Veranos de la Investigación Científica" (Scientific Summer Research Experience) began in 1990 as an initiative of the Mexican Academy of Sciences. It was developed as a strategy for increasing the small number of scholars in Mexico[1] and addressing the need for preparing young scholars given the increasing age of Mexican researchers (Herrera, 2002).

The purpose of the programme is to increase undergraduate student motivation towards research and evaluation in the social and natural sciences as well as the humanities. Student participants remain for a period of two months working as apprentices under the supervision of a researcher in the most prestigious research centers and universities of the country (Mexican Academy of Sciences, 2003). The summer programme begins at the last week of June and continues through the second week of August. Its purpose is to develop student skills and increase their motivation towards their scientific preparation. In addition, it stresses the importance for students in developing skills that allow them to work in research and evaluation of programs serving the needs of culturally and ethnically diverse populations.

The support for the programme has been increasing over the years. The Mexican Academy of Sciences and the Mexican Department of Education provided a support of 2,002,000 pesos during 2004 and have continued increasing their support until the present. At the same time, local universities have begun to provide additional support for students to participate in the programme. In spite of this support, little is known about the programme benefits, although one evaluation was carried out by Villa, Sánchez, Romero, Morales, and Guzmán (1996), who conducted a survey of the participating students to see if they continued their graduate education after completing their college studies. Findings of Villa et al.'s study indicated that 56% of students who participated in the programme during the prior year had graduated from college, 38% of the graduates were working in a field related to their major, 27% started their graduate studies, and 24% were working on their bachelor's thesis. Villa et al. (1996) concluded that the programme was of high quality, because it accomplished the objective of increasing the number of students who selected a thesis as an option for graduating from college, as well as increased the number of students who entered to a graduate programme after college graduation. Villa et al.'s evaluation provided valuable information but mentioned very little about the benefits of students and faculty members who were currently participating in the programme, as well as about programme implementation. Because Villa et al.'s (1996) study was taken place in 1996, a new evaluation program was needed to address these important aspects.

Methodology

Study Objective

The purpose of this evaluation study was to determine the benefits of the program for students and faculty members who were currently participating in the programme, as well as the strengths and weaknesses of the programme, primarily for improving its implementation.

Participants

In 2008, 143 students participated in the programme in the Southeast of Mexico. In order to obtain a better

[1] According to the Special Programme on Science and Technology (2001-2006), there are 25,000 researchers in Mexico. This is equivalent to 0.7 scholars among 1,000 people, while for the same amount of people, there is one scholar in Brazil, four in Spain, six in Korea, and 14 in the United States.

understanding about the benefits provided by the programme as well as its strengths and weaknesses, an evaluation was conducted during the fall of 2008 with a sample of 60 students (41%) and 15 educational researchers and evaluators (100%) who participated in the summer programme. The evaluation was conducted as a request from the local university; the administrators required information that could be used for making decisions about improving program procedures and increasing the number of participants for the following academic year.

The evaluation followed Campbell's evaluation model. The design was a shot-case study. We reviewed students' educational path after graduation and interviewed a group of participants after the program concluded to determine its strengths and weaknesses.

All students were affiliated to public state university system in Yucatan, with the exception of four students who were affiliated with a university from the north of Mexico. All students received support for the summer programme through the Mexican Academy of Sciences, the State of Nayarit, the programa Delfín (Dolphin programme), and the Programme for Promoting and Orienting the Research (PRIORI) in the state of Yucatan. Half of the students participated in the summer programme in the state of Yucatan and the other half traveled to research centers or universities in other Mexican states.

Data Collection and Analysis

Data gathering involved focus group interviews with students as well as semi-structured interviews with the faculty members participating in the programme. During the focus groups, the evaluators asked the students about their reasons for participating in the summer program, the activities in which they were involved, as well as to reflect on their whole summer experience, its benefits, strengths, and weaknesses of the program, and their recommendations for improving the whole summer experience. Faculty interviews, which took place in the instructor's private office, were centered on their experience with the program and its strengths and weaknesses, and each interview lasted approximately an hour and a half.

Data analysis and interpretation was quantitative for the analysis of student data about their academic path after the program. Interview data analysis was qualitative. All information from the focus groups and interviews was transcribed. Themes were identified. Following Jorgensen (1989), the researchers "sorted and sifted the data, searching for types, classes, sequences, processes, patterns or wholes, the aim of the data analysis was to assemble or reconstruct the data, in a meaningful or comprehensible fashion" (p. 107).

Member checking was used for verifying the facts and interpretations made by the researchers. Transcriptions and written interpretations were made available to the interviewees; this was also an opportunity for confirming the accuracy of citations and descriptions.

Findings

Documentary analysis of student data indicates that most students who conclude the program participate in future educational programs to increase their preparation in research. Interviews from the participants also provided valuable information about students' interest for participating in the program, benefits from this experience, as well as its strengths and areas for improvement

When asked about the reasons for participating in the program, the students indicated that some of them were curious about researchers (40%). They wanted to know what they were doing and how they were different from other instructors. One of these students stated:

> I wanted to know more about the researchers. Some of my friends have taken courses with research professors and said they were different. I found out that this is true, they are more critical than other instructors. They take a deeper look at things. They are not content with the first impression. Some of them are hyperactive; others seem lost in their thoughts. I think this is why my friends think that they are strange. (S-1)

Other students (60%) decided to participate in the program because they had a course on research or had a family member or a friend that shared with them how much they liked the experience of participating in the program. As one student stated:

> My sister is an economist. She participated in the program. She was so excited. I was curious; I wanted to know more. This is why I decided to become involved…. (S-2)

During the summer experience, some students participated in research projects (85%) and evaluation activities (15%). The evaluation studies included the evaluation of a social service programme at a private institution, the evaluation of the tutoring programme in a public university, as well as the design of a system for faculty evaluation and development, among others. Some of the main activities in which students were involved while participating in the summer programme were searching for scientific papers in databases and libraries, writing of a literature review, designing of instruments for data collection, conducting fieldwork under supervision, working on data organization and analysis, and presenting papers at scientific and academic meetings.

All students perceived that their participation in the summer programme had provided them with personal benefits as well as with the acquisition of research and evaluation competences. Among the acquired competences, they indicated the following: increased critical thinking skills, knowledge about information sources and how to search and analyze scientific information, classify and analyze literature findings, use of databases, increased skills for decision-making, problem-solving skills, experience in presenting their work and receiving constructive criticism, better time management, increased independence and autonomy, and awareness of the reality and demands of fieldwork. The students perceived that their participation helped them learn about important social problems, such as the one described by one of the participants:

> My summer research experience was in the biosphere of Calakmul, in Campeche (a neighbor state). I worked with a researcher on a study of the health conditions of the people from that community. It was very exciting; I conducted interviews to the people about their health habits. I learned a lot. I felt that my work was a contribution. The larger diagnosis was going to be used for making a proposal to improve the health in that community. (S-3)

Another outcome from the summer experience was to meet other students interested in research and being able to know the researchers as persons. As a student added:

> The good think about the research experience was to meet students from other Mexican states. I now have friends from Tabasco, Veracruz, and Chiapas. Staying at a research institute was impressive. I also liked knowing the researchers personally. The professor who directed my project was very down to earth, a very nice and kind person. He was not only concerned about my learning; he helped me personally and academically. (S-4)

Among the personal benefits identified by students who participated in the summer experience were their increased academic maturity, personal self-reliance, opportunity to practice what they had learned during their college education, as well as an increased interest for continuing learning about research and evaluation.

Limitations and Constraints

One of the 60 students indicated that she experienced problems because of the attitude of the researcher who was supposed to work with her during the summer. She was a first-year college student and began the summer experience prior of taking a research course at her institution. The researcher ignored this situation and put much pressure on her to develop a new research project during the summer. At the end, the student decided to leave the institution where she was supposed to complete the summer programme and returned home after notifying the programme coordinators of this situation. In spite of this, the student stated that this situation could be avoided if the institutions in charge of the programme make clear the expectations for both faculty and students participating in the summer programme, so each one knows what to expect and plans the summer experience based on a realistic basis about student competencies and knowledge.

Ninety-nine percent of the students concurred that there are problems with programme implementation, such as lack of a clear purpose of the summer experience for students, researchers, and evaluators participating in the programme. They also found some problems identifying how to apply for the programme, how to identify the researcher with whom they could work for the summer, as well as schedule conflicts because the summer programme started before the spring semester at their college had ended. Other students perceived that although most higher education institutions were eager to participate in the programme, most libraries, computer laboratories, and research offices were closed during the summer, which negatively affected their work during the summer programme. Students also perceived that there was a need for planning a continuation of the programme to ensure more support to those students interested in continuing their preparation as future scholars. In addition, students indicated that not all researchers had the same disposition when participating in the programme. Some researchers gave students the opportunity to develop a small project, while others expected students to work in a project already being developed by the researcher. In some cases, students were matched to a researcher who was in another field than theirs, which required more work for them because they lacked prerequisite knowledge.

Thirty students who participated in the programme in their own state had a more positive perception about their whole summer experience than did those who traveled to another state. Although these students were among those describing higher personal benefits from the programme regarding time management, organization, independence, and the opportunity of being exposed to another institution and approach to research, they felt that the funding for the summer programme was insufficient. Students supported by the Mexican Academy of Sciences reported more problems with the limited funding than did those who participated in the programme Delfín. In spite of the problems, students indicated that the experience of participating in the summer programme was rewarding and expressed their intention for participating again in the following year. According to them, their participation has allowed them to develop research skills and increase their interest for research activities.

To improve the programme, students suggested the need for providing more information about the researcher project and expectations for those who wanted to work in that project during the summer. In addition, they recommended the inclusion of extracurricular activities to provide deeper understanding about research conceptions, an opportunity to explore their own research interests and to reflect about the summer experience after the summer. As Langenbaek (2003) stated that these activities can provide a deeper student understanding of research, as well as increase their learning as a process, not only as outcomes, and their commitment to the construction of knowledge.

When asked if they were going to do a thesis for their college graduation, students had divided opinions. Since most colleges have included alternative forms of graduation, such as approving a national exam after graduation, registering for graduate courses, or obtaining a grade point average (GPA) higher than 90 points on a scale from 1 to 100, half of the students felt that these alternatives were more attractive because the process for approving their thesis projects at their colleges took more time and was longer than the other alternatives for graduation. Even though the university has implemented a fellowship programme for supporting undergraduate students who decided to work on a thesis, most students perceived that this alternative was not attractive enough given the advantages of the other graduation alternatives. However, even the students who did not plan to choose a thesis as an option for graduation indicated that they were interested in continuing their graduate education and had an interest for continuing their preparation in research and evaluation at the graduate level.

Faculty interviews were consistent with student perceptions about the benefits of the programme. Professors perceived that the summer programme provided students with the development of both academic and personal competencies. For faculty participating in the programme, this was very important since they did not receive any economic support for their participation and were devoting their vacation time for working with students during the summer. Faculty members also stated that although the programme had many benefits, the funding provided to students for traveling to another state for their summer experience was insufficient. This created for them not only the responsibility of providing students with a learning experience, but also the need of finding an accessible place to stay, and in some cases, providing additional support for student transportation. Because of these circumstances, they believe that more professors were not participating in the programme. They also indicated that some of the students who participated in the programme had problems in written communication and needed guidance on how to write academic papers. Two professors indicated that students also needed to be taught about authorship and plagiarism. For example, one researcher indicated that he just found out that two students, who participated during the summer 2008, were intending to publish a paper on his research as if this was their study. The professors as a group proposed the need for teaching students about authorship and plagiarism. In addition, they stated that the decision of the programme organizers to have a student conference at the end of the programme where students presented their research experiences was not well designed because some students presented the researchers' study as their own and did not always clearly state what was their participation in the research. Instructors suggested that the conference should provide an opportunity for students to present their reflections on the whole summer learning experience rather than take the style of a research paper presentation because it was difficult for some students to realize the limits of their participation in the study in which they were involved during the summer.

Conclusion

According to the findings of this evaluation, the summer programme presents both strengths and weaknesses that deserve further study, such as the way in which it is implemented and the support provided by the host institutions for the implementation of the summer research activities. Other aspects, such as student funding, selection and acceptance for the programme, and the selection of researchers can be improved, as well as the type of reports that students present at the final conference at the end of the summer experience.

In spite of all of these, the Scientific Summer Research Experience Programme seems to be providing students with an opportunity to learn about research and evaluation by becoming active participants in their

own learning, as well as being acquainted with different contexts and forms for conducting research. The experience as a whole provides them with the acquisition and development of other competences: cognitive, instrumental, and attitudinal that can increase student motivation to continue with a solid preparation in educational research and evaluation if additional support is provided for those interested in continuing their preparation as future researchers and evaluators.

Given the limited literature about non-formal programs for preparing young evaluators and researchers, in particular about the Scientific Summer Research Experience Programme, this study adds to the literature about the preparation of young researchers and evaluators. In addition, findings of the study can be used for programme improvement, can lead to the establishment of policies for improving the quality of research, and consequently in the quality of education (Shavelson & Towne, 2002).

Indeed, findings and constraints identified in the evaluation were of high interest for programme managers. Based on the findings, new changes were put into place during programme implementation; the university also augmented its support for increasing the number of student participants at the state level from 143 to 245 in the following academic year.

As Young (2001) indicated, "We need to go back to the purpose of preparing future researchers for improving education" (p. 3). This implies that we should find the right venues, improve them, and continue to bring opportunities for the youths who want to continue this important work.

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