



Evaluation Report

**Research Experience for Teachers University of Illinois at
Chicago Summers 2005/2006**

Created by Department of Program Evaluation

Prepared by Chicago Public Schools

2/8/2007

The conclusions drawn in this report reflect the viewpoint of the authors. While there are many potential viewpoints with respect to a given program, one way to facilitate improvement is through open discussions of such differing opinions within the context of data-based reporting.

Questions or Comments?

If you have any questions or comments about this report or related work, please feel free to contact Bret Feranchak (773-553-2497, bferanchak@cps.k12.il.us) in the Department of Program Evaluation.

Introduction

This memo provides an overview of participant reactions to the Research Experience for Teachers (RET) program offered by the University of Illinois at Chicago.

Data

Data were collected via structured short phone interviews and on-line surveys. Both the 2005 and 2006 cohorts of the RET program were sent survey invitations, and a total of 16 teachers out of 20 responded. Six of the nine participants from the summer of 2005 session and ten of the eleven participants from the summer of 2006 session responded to the survey. Because nearly all participating teachers completed the survey (80%), the survey results are probably representative of their views. All members of the 2005 cohort were contacted to participate in the interview portion of the evaluation. This group was specifically selected for follow-up because they had had time to create and implement the classroom modules as a follow-up to their participation in summer research. Only three of the nine (33%) responded and volunteered to participate. Several unsuccessful efforts were made to contact the other participants. No participants declined to participate. In contrast to the high level of survey participation, since a far lower percentage of teachers participated in the interviews, data from the interviews should be considered to be less representative.

The online survey consisted of one background question identifying which summer the teacher participated in the program, six multiple-choice questions asking about the impact of the RET program on science instruction, and two open-ended questions which allowed for suggestions and general feedback about the program. All multiple choice questions were answered on a 4 point Likert-type scale. In this report, references to response options are in italics.

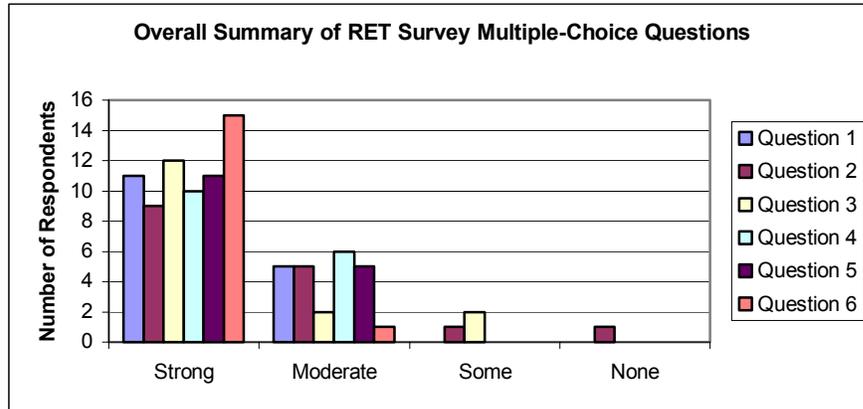
The interviews were structured by six initial questions each with additional probes. Certain responses to both the open-ended and interview questions expand on the topics covered in the multiple-choice. In this report, the matching responses will be discussed together.

Overall

Overall, teachers reported very positive reactions to the RET program. The questions on the teacher survey were coded to indicate teachers' perception that the program had impacted their science instruction. In order to summarize the overall

results of the multiple choice section, the answers to each question have been summarized as implying either strong impact, moderate impact, some impact, or no impact. As can be seen in Figure 1, there were only four instances where the response to a multiple-choice question fell within the “some” or “none” categories. Conversely, 96% of the responses demonstrate that the teachers felt the program produced either a moderate or strong impact on their instruction of science.

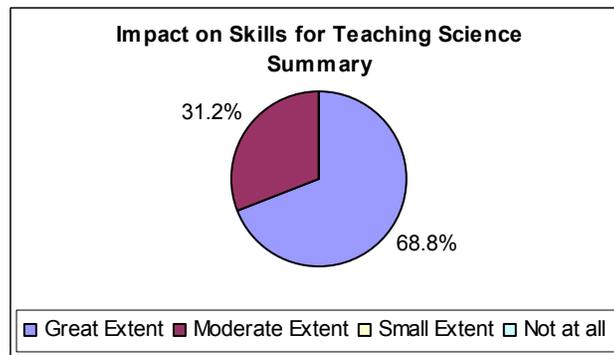
Figure 1



Impact on skills for teaching science

The first question asked about the extent to which they felt that they had “learned skills which will help you translate your science knowledge into lessons for your students?” About 69% of teachers responded that the program helped them to a *great extent*, while the other 31% felt the program helped them to a *moderate extent*. None of the respondents chose the *small extent* or *not at all* options (see Figure 2).

Figure 2



However, in the open-ended responses, two teachers requested more in-depth instruction about how to link what they learned in the RET program with the

practical applications of those lessons in their own classrooms. One teacher commented, *“I would have liked to see more discussion on how to translate this experience into a high school science class. How do we take the RET experience and use it to help our students develop critical thinking skills? How do we capture the enthusiasm of academic researchers for science and infuse it into our high school students?”*

Another teacher felt that the level of the RET experience exceeded her students’ *“knowledge base”* to such an extent that she was unsure of how to develop lessons based on it.

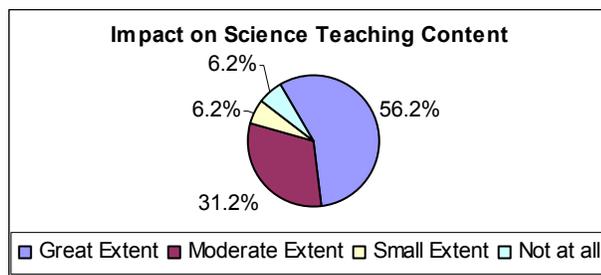
One interviewee noted that he felt the university professors were not always interested in what was happening at the classroom level. He explained that there seemed to be *“one-way communication”* with the professors and suggested that *“if the university professors had been teachers they might understand the difficulty [of translating the RET experience to in-class instruction] better.”*

Two teachers felt the program could help them transition the information to their classroom through the opportunity to engage in discussion with their peers. One teacher suggested that the university instructors *“allow time for the teachers in the program to discuss science teaching ideas,”* and a second teacher requested *“time to work on lessons with other teachers and UIC professors.”*

Impact on science teaching content

Teachers were also asked about the extent to which the RET program impacted the content of the science they teach. As can be seen in Figure 3, the majority of respondents felt the RET program had either a *great* or *moderate* impact on their science instruction. There were only two respondents who chose either a *small extent* or *not at all*.

Figure 3

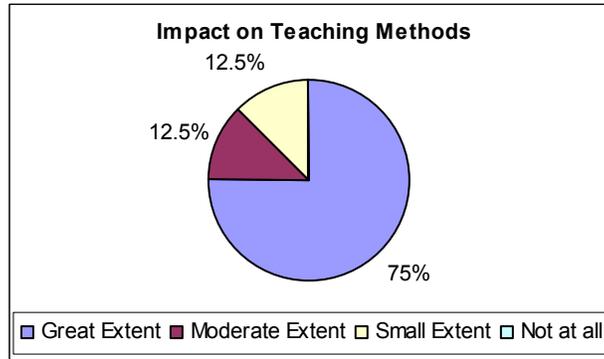


Impact on teaching methods

In response to the question, *“To what extent did the RET program impact the methods you use to teach science?”*, 75% of respondents reported that the program

had a *great* impact on their use of methods. The remaining four were evenly divided between a *moderate* and *small* extent (see Figure 4).

Figure 4



Several teachers noted that the RET program had changed some of the methods they used to teach science, or had improved their skills in ways which helped them teach using different methods. One teacher reported in an interview that she felt her special education students learned best through visual methods. She said that the RET program helped advance her abilities to use effective visual methods in her instruction, particularly for students who were not reading or writing at grade-level. In addition, this teacher felt that she had learned valuable computer skills which enhanced her ability to teach her students using visual methods.

Another teacher mentioned in the interview that, after participating in RET, she better understood the importance of including scientific inquiry in the design of labs for students, and focused on the “*process of designing, testing, redesigning and retesting.*”

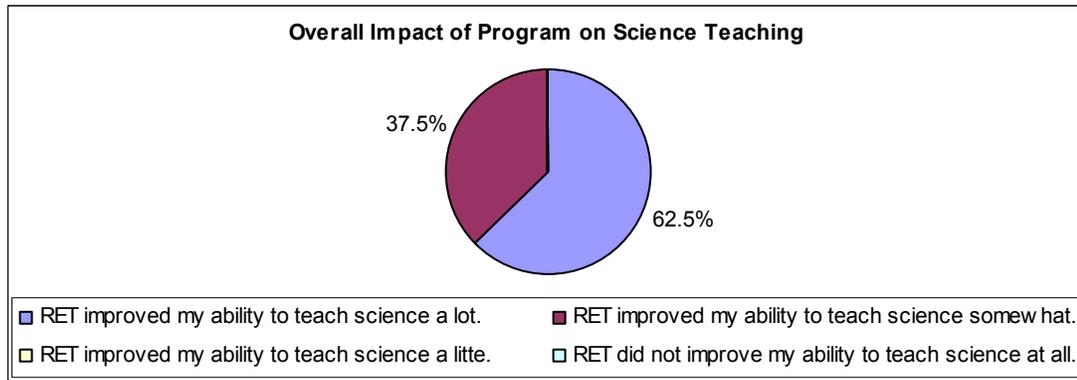
The third teacher interviewed noted that she adapted the models of team work she saw being utilized by the university researchers into the design of her in-class group work. She explained that she instructs her students to do most of their research individually, but to return to “*team meetings*” where each student reports findings and “*everybody helps each other*”.

Several teachers reported the perception that the strongest impact the RET had on their instruction was in relation to their use of research methods and scientific inquiry. One teacher pointed out that “*kids always think things are like a cookbook lab, you always know what you’re looking for.*” This teacher felt that after attending the RET program, he was much more likely to use inquiry-based methods in the classroom in an attempt to emphasize the process of discover for the students, rather than having them view science discovery as a “*cookbook method.*”

Overall impact of program on science teaching

Teachers were also asked, “Overall, how much did the RET program contribute to your ability to teach your students science?” As can be seen in Figure 5, about 63% of the respondents felt that the RET program improved their ability to teach science *a lot*, while the other 37% felt the program improved their ability to teach science *somewhat*. None of the respondents felt that the program was ineffective or had only a small impact on their ability.

Figure 5



Details from the interviews reveal the shape and scope of the impact. The first interviewee stated simply, “*there was a direct relationship between my research as a fellow and my classroom effectiveness.*” This was based upon her perception of an increased ability to instruct her student in the specific manner they learn most effectively via the methods of instruction she learned in the program.

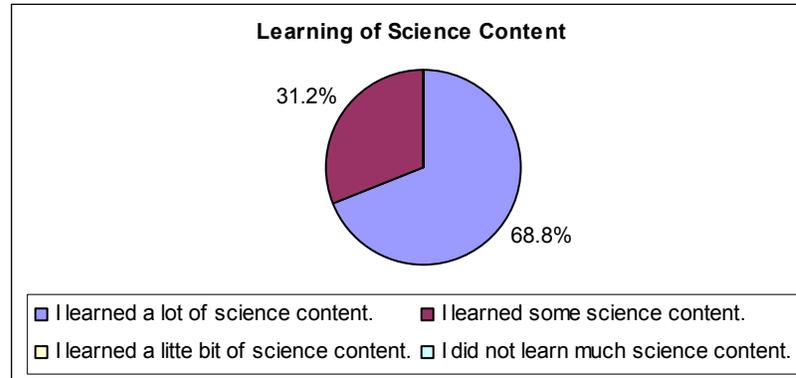
Another interviewee felt the RET program benefited her in that it significantly increased her credibility with the students because they felt that she had “*participated in real science.*” The teacher felt that this helped students see that there was a connection between what they were learning in the classroom and science which is conducted in the real world.

A third interview participant felt that nothing she learned in the program was specifically “*related to my world*” in terms of being able to translate the knowledge and/or skills into classroom lessons. However, she noted that the program gave her a more extensive understanding of “*what kids need to be prepared for [scientific] careers,*” that she improved skills for using technology and scientific instruments, and that she developed an increased enthusiasm to try new approaches and experiments in the classroom. However, this teacher also noted that there were some significant barriers to implementing what was learned in RET in a real classroom, notably because of a lack of instruments and/or technology. Interestingly, this teacher also noted that although she felt that many of the more concrete concepts and skills she learned in RET were not directly transferable to the classroom, there is “*nothing wrong with the teacher doing the program for their own edification... don’t have to be able to translate everything directly to the classroom.*”

Learning of science content

Teachers were also asked about the extent to which the RET program taught them science content. The majority of teachers (69%) felt they had *learned a lot of science content*, while the additional 31% felt they had *learned some science content*. None of the respondents chose either *I learned a little bit of science content*, or *I did not learn much science content* as describing their experience.

Figure 6



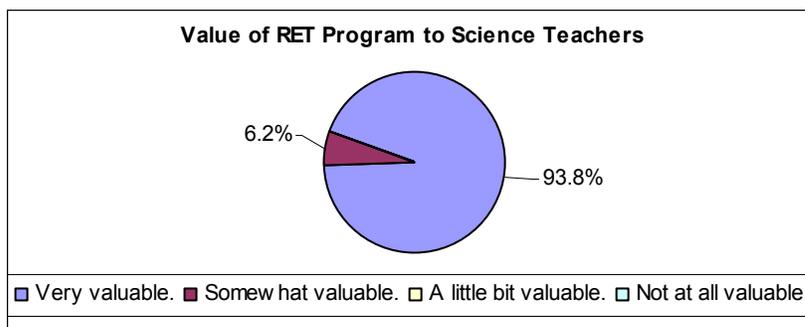
Overall, the teachers portray the understanding that the focus of the RET program was to gain a better understanding of scientific methods and scientific inquiry. None of the respondents spoke about any specific science content learned in the program, such as new knowledge of chemistry or physics. Throughout the responses, it is clear the teachers came away from the experience with an increased awareness of science as an active exploration. One respondent replied, “*the spirit of inquiry was firmly implanted in us, as were the spirit of collaboration and the importance of technology.*” Another aptly explained that she “*understands the process of doing science better.*”

The third feels that she learned how to better identify “*what problems are and how things are done.*” She seems to feel that the goal of the RET program was to learn what being a scientist is about. She also added that the collaboration with the professors was invaluable because it enabled her to run questions by professors in order to gather information which could then be shared with students.

Value of RET program to science teachers

The final question is the most summative of the teachers’ assessment of the benefits of the RET program. “How valuable do you feel that the RET program was to you as a science teacher?” All but one of the teachers reported that they felt the RET program was *very valuable* to them as science teachers. The remaining teacher found the program *somewhat valuable*. None of the teachers found it *only a little bit valuable*, or *not at all valuable*.

Figure 7



Suggestions about improving science teaching

Teachers also provided some suggestions about how the program could better help them improve their teaching of science. Three respondents suggested that there should be more interaction among the program participants, two respondents felt they would benefit from doing more experiments, and one teacher suggested more visits to *“facilities and industries.”*

Suggestions about improving the RET program

Teachers also provided some suggestions about how the program could be improved. Four respondents felt the RET program should be expanded. Although one teacher simply made a general request for expansion of the program, one teacher specifically explained that he would like the opportunity to *“continue developing scientific content knowledge”* after the RET program was over, another teacher added that she felt it would be helpful to have *“additional training before starting the program so teachers can come in [to the RET summer experience] and be an active part right away.”* A third teacher suggested that the program should occur over a series of summers.

Two teachers noted that they wanted additional support. One teacher wanted an increased availability of the university staff, as well as material support to help guide the teachers. The other teacher wanted the possibility of gaining access to materials or a *“small budget to buy materials for trial labs/lessons”*.

In addition, one teacher felt that a program length of six weeks would be adequate and that ten weeks was *“too long when you’ve worked a full year with no break between the school year and the RET experience.”* Another teacher expressed an interest in receiving lane credits or CPDUs for participation in the RET program, stating that *“CPS needs to celebrate their teachers who successfully complete RET programs at UIC, Northwestern University, or Illinois Institute of Tech to encourage others.”*

Conclusion

Overall, the teachers were extremely positive about their experiences in the RET program at University of Illinois at Chicago.

The results demonstrate the teachers' perception that the program had a significant impact on their science instruction. In addition, they convey an overall interest in gaining access to even more of certain existing elements of the program.

Specifically, the two major themes that emerge from the teachers' open-ended and interview responses relate to the perceived purpose of the program and the greatest challenge of the program. Based on their feedback, the teachers seem to believe that gaining a better understanding of 'scientific inquiry,' or the 'process of science,' was the main purpose of the RET program. In addition, their feedback also confirms that they greatly approved of this goal, feel it was successfully achieved, and is very valuable to them as teachers.

On the other hand, they expressed a substantial struggle with actually translating the lessons learned in the RET program into specific lessons. The responses most notably included not knowing how to translate the level of work done in the program to an in-class experience that suits the ability and understanding of their students. Generally, the teachers seem to want more direct instruction on specifically how to formulate lessons based on the experience.

Reflection questions for program planners

- As stated in the conclusion, the teachers believe that gaining a better understanding of 'scientific inquiry,' or the 'process of science,' is the main purpose of RET, how does this reflect the actual intention of the program?
 - If this statement does not reflect the intention of the program, why might there be a difference?
 - What adjustments could be made to produce the intended outcome of the program?
- The teachers report having difficulty translating their experiences in the RET program to lessons in their classrooms, is it a goal of the program to prepare the participants with the skills to make this translation?
 - If so, what steps can be taken to ensure participants have these skills upon completion of the program?
 - If not, is this something that might be beneficial to add to the program?

- The respondents also convey an interest in gaining access to more of certain existing elements of the program, as detailed in the ‘Suggestions about improving the RET program’ section above.
 - Is it feasible to increase the availability of certain resources for the RET participants?
 - Is it feasible to assist in expanding access to resources, whether material or in person, for the support of classroom lessons after participation in RET?
- To what extent does the RET program align with the district’s other mathematics and science offerings? Should it?