

UNIVERSITY OF PUERTO RICO
HUMACAO CAMPUS
ADVANCE-IT PROGRAM
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EXTERNAL EVALUATION REPORT:
Strategic Conversation and Critical Reflection on
Effectiveness and Outcomes of
ADVANCE Institutional Transformation UPRH Program

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October 18, 2005

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EXECUTIVE SUMMARY

Strategic Conversation and Critical Reflection on Effectiveness and Outcomes of ADVANCE Institutional Transformation UPRH Program

Strategic conversation is a powerful intervention that creates opportunities and spaces for informal and formal dialogues through which views can be exchanged outside the pressure of immediate decision making. It requires a balance between integration of mental models to share conclusions and move forward and differentiation of mental models to ensure the analysis of weak signals in the environment, are considered and incorporated in the decision making process and acted upon.
Van Der Heijden, Kees (1996)

INTRODUCTION

The UPR-H ADVANCE-IT Principal Investigator, Dr. Idalia Ramos and Co-Principal Investigator, Prof. Sarah Benítez; contracted an external evaluator to develop and implement the ADVANCE-IT UPRH 2005 External Evaluation, based on the existing Evaluation Plan. The initial meetings were held between March and June of 2005. During these meetings, a broad far-reaching understanding of the Program's present reality, future threats and opportunities, were discussed and reflected upon.

In addition, the group exchanged views on several methodologies to compile the data needed for the 2005 evaluation activities. Finally, decisions were taken related to the methodology and procedures for the evaluation. It was also, decided that the evaluation would start no later than the third week of August 2005.

This document highlights the methodology, principal findings, conclusions and recommendations of the evaluation of effectiveness and outcomes of the ADVANCE-IT UPR-H Program. It is based on the external evaluator assessment of the UPR-H research program effectiveness and impact. This report is presented as an instrument to promote momentum to the strategic actions needed, which will promote continuity and excellence of the Program; even after NSF funds are finished.

EVALUATION METHODOLOGY

As part of the Program's NSF 2005 Progress Report; objective and comprehensive data on the program's performance was needed. Also, recommendations and strategies for improvement were considered essential. After discussion on possible procedures, it was decided to give participation in the evaluation, to the program's faculty and faculty that has not participated in the

Program, through a structured interview methodology. The interviews would be complemented with analysis of secondary data from the Program's official documents and from the Internal Evaluation information.

Based on the data needed, the external evaluator prepared an Evaluation Action Plan to guide the evaluation efforts. (See Appendix I). This tool was prepared as a guide to integrate ADVANCE-IT UPRH Program internal and external evaluation processes and products.

As part of the External Evaluation Process, a logic model was designed to portray a comprehensive view of the Program. (See Appendix II). Also, the external evaluator represented the UPR-H ADVANCE-IT Program at the special Task Force of NSF awarded Institutions from June 5 to 8 of 2005, at New Mexico University and from September 11 to 13, 2005, at University of California at Irvine. During these meetings, the interdisciplinary group developed Evaluation Kit # 2, which will be used by NSF ADVANCE-IT 2006-2007 awardee institutions. These two working experiences were instrumental in the integration of internal and external ADVANCE-IT UPRH evaluation efforts.

Appendix III describes the principal evaluation practices at UPRH ADVANCE-IT Program. This table was prepared as part of the NSF Task Force work. Therefore, it presents a broad overview of the UPRH evaluation processes and products.

The structured interviews with the UPRH science faculty were held in August 16, 19 and 23 of 2005. The meeting to integrate the internal and external evaluations was celebrated on October 4, 2005.

At the same time the external evaluator was conducting the structured interviews; the internal evaluators were compiling data, as part of the NSF twelve Indicators Evaluation Kit #1. Also, the PI and Co PI gathered data on research productivity at UPRH and a contracted lawyer analyzed the different changes in institutional policies, norms and procedures, for the past four and a half years; since the ADVANCE-IT UPRH Program started in year 2001-2002. These four areas of evaluative information were considered fundamental elements of the 2005 Evaluation Plan, which will help in the future development of the program.

Twelve structured interviews were performed personally and one by phone, due to availability of both the faculty member and the external evaluator. During the interviews, the external evaluator worked as a facilitator using a style of language that avoids being critical or judgmental, such as: paraphrasing or describing in the evaluator's own words what the person remarks may convey. Also, perception checking was used, to help in describing what the external evaluator perceived to be the person's understanding of the matter.

In addition, the evaluator made lots of questions in different question formats: fact finding questions- to verify data and gather information about the current situation; tell me more questions- to find out more about what the participants say; and best/least questions- to provide the facilitator information about potential opportunities in the situation under analysis. Appendixes IV and V, include the female and male questionnaires used for the structured interviews.

PRINCIPAL SIGNIFICANT FINDINGS

The faculty that participated in the interviews were selected among women participating in the Program and four men faculty not directly participating in the Program; whose profile matched at least one Program's female faculty, from the same Department. Among the women selected to be compared with the male researchers; two of them have been at the Institution for more than 20 years, while the other two, have five to seven years of experience at the Institution.

Nine UPR-H women researchers, from a total of 28, were interviewed. Four men researchers non-Program participants were also interviewed. The male researchers and women were selected from the Departments of Chemistry, Mathematics, Biology and Social Sciences, based on their similar profile to four ADVANCE-IT women researchers. Physics Department did not have a male researcher representative, that could be matched with a female researcher program participant.

The similarity in female and male faculty characteristics were: same year of starting employment at UPR-H, same starting academic rank, and same starting academic preparation. The distribution of the interviewed researchers was as follows: two professors from chemistry, two from mathematics, four from biology and three from social Sciences Department. There were two other UPR-H ADVANCE-IT faculty that were recommended for the interviews, but were unable to participate, both from the Biology Department.

The analysis of the data collected will be presented first: by comparison of four pairs of women and men researcher's. Second, the analysis of perceptions of the nine Program's participants will be analyzed as a homogenous group.

Comparative Analysis of Four Pairs of Women and Men Researchers

The first duo of researchers have a good knowledge of the Program's goals and achievements. They both have around 25 years of academic work at UPRH. The male understands that there is a low level of female participation in research, and low advancement of women faculty in the natural sciences; because, as he said, "*women are a disadvantaged group*". On the other hand, he also remarked that "*Women just don't have the time required for research and for academic leadership roles*", which is a clear recognition that it is a macro social problem.

The principal Program's **strengths** the female researcher mentioned were:

1. The Program is a Center for interdisciplinary work with faculty and students alike.
2. It fosters collaboration with peers inside and outside the Institution.
3. It provides excellent administrative and financial support to the researcher through: lab space, tools and instruments.
4. The Program's PI and Co PI are supportive and understand women's situation.
5. Workshops are considered a great help and a networking opportunity.

The only **weakness** that she could mention was:

1. The Program is only directed to faculty and not to students directly. It would have been even more successful if both students and faculty members could have been part of the Program.

When the male researcher was asked on the **problems** that inhibit research at UPRH, he said: physical infrastructure, low quality of students, and UPR policy which restricts UPRH to an undergraduate level only. The female faculty member said the principal **Program barriers** were: physical facilities, administration does not support research, and class workload is very high. Both said they had no knowledge of changes in institutional policies to strengthen research activities at UPRH.

To really strengthen research at UPRH, she **recommends** reducing academic workloads to three credits per semester and renovate and increase laboratory's physical space.

Table I compares several research productivity indicators by the four pairs of researchers interviewed. The following observations and analysis are derived from it. When asked on the benefits and opportunities for **leadership experiences** as a value added of the Program; both said they haven't been interested in leadership positions at the campus or at department level. The woman said it was a personal decision, because of family matters and academic workload; the man said, it was because of health reasons.

In terms of bringing **external resources** to UPRH, the man has brought three projects; two for around 3 to 4 million dollars from NIH, and the third one is an external collaboration. The woman researcher has not brought any external resources. He is the principal investigator in the two projects he has brought. Also, he has submitted two other research proposals. They were approved, but not funded, because of the UPRH undergraduate status and UPRH research

infrastructure problems. She has not submitted any outside proposal, except the internal proposal to ADVANCE-IT UPR H.

In terms of **publications**, the female researcher has four peer journal publications, two other articles have been submitted and a total of eight international conference proceeding. The male researcher has 24 peer journal publications, and no conference proceedings. Both have had academic rank promotions to the upper professor level.

In **general terms**, it appears from the information discussed, that this male researcher has in fact been more productive than the female; during his research career in: bringing external funds and in journal publications The woman believes that her comeback five years ago, into research life is entirely because of the benefits and strengths the ADVANCE-IT Program has. Therefore, it can be stated that the Program arrived twenty years late in her scientific career. During the past five years she has restarted a scientific career, as reflected in her peer review journal publications and conference proceedings. Through the Program, she has been able to interchange experiences and collaborate with other researchers from the UPR, Río Piedras Campus.

The second duo of researchers, both have very good perceptions of the quality of the UPRH ADVANCE-IT Program. The male researcher understands the Program supports young researchers at the Campus. She believes ADVANCE-IT arrival at UPRH, was a perfect match for her needs.

The **principal Program strengths** the female researcher mentioned were:

1. Economic support.
2. Participation in seminars and conferences outside of PR.
3. Supportive research environment
4. Promotes networking and working relationships with women researchers from other universities in and out of PR.
5. Excellent administrative support, even for buying lab materials.
6. Proposal writing advise and counsel.

The female faculty couldn't think of any ADVANCE-IT UPRH weakness to mention.

When asked about **problems** that inhibit research in UPRH, the male faculty said:

1. Lack of administrative continuity at upper levels of executive management.
2. External Resources office was dismantled and there is no one now to support research.
3. Unclear policy in relation to research.

4. Library resources are way behind to positively impact research. It is devoted to classroom support.
5. Problems with electricity and water shortage.
6. Lack of adequate for research and lack of materials.

The principal **barriers** to research, were summarized by the female researcher:

1. Lack of advise in proposal writing.
2. The Library is obsolete. There are no electronic journals.

Both consider there have been no changes in institutional policies that may promote research.

Looking into the near future, he **recommends**:

1. Create a permanent External Research and Development Office.
2. Approve an institutional policy that is independent of the undergraduate status of UPRH.
3. There is a need for an appropriate amphitheater for conferences and seminars.
4. Change requisition processes for materials and lab chemicals. Consider the use of Institutional credit cards.
5. Strengthen the Visiting Professor Program.

She also **recommended** the need for the External Resource Office and enhancement of student participation in research.

Observing Table I, none of this second pair of researchers have occupied leadership positions. The male researcher has brought one proposal for around \$300k in external funds. She has brought funds for educational purposes. (around \$400k). Both have been Co Pi's for research projects.

During the last five years in ADVANCE-IT, she has published in peer review journals, while he has not. She has three peer review journal articles, one in preparation and three conference proceedings; while he has only three or four conference proceedings and no publications. He is presently an Associate professor. Next year he is due for professor promotion evaluation. She is already a full professor.

When **comparing this second duo**; it appears that the woman researcher has been the most productive one. She is already a full Professor and he is an Associate Professor. Both have been Co Pi's of research projects. He brought external funds, but on one occasion only. She also brought funds on one occasion, but a higher amount; and has had several publications in peer journals, while he hasn't have any. It is evident the woman researcher took the lead because of ADVANCE-IT program support and encouragement.

In analyzing the **third pair**, both of them have had very good experiences with the Program and have had students that have received benefits from the program.

The principal **strengths** the female researcher mentioned were:

1. The excellent workshops.
2. Participation in seminars out of Puerto Rico with funds provided by the Program.
3. Workshops and support in rank promotion.
4. Excellent support in buying research materials and processing of requests.
5. Excellent quality of the Poster Presentations she has been able to do with the Program's help.

In terms of **weaknesses**, she stressed the following:

1. There is a need to offer other workshops in themes related to women special needs such as: Efficient use of time and how to establish priorities between family matters and research responsibilities.

In terms of research **problems or barriers** in UPRH, he mentioned:

1. The UPR policy which gives full responsibility to the professor for any accident at the labs and no responsibility for the student.
2. Lack of laboratory space; he has seven to ten students in a small lab which is also his office.
3. Requisitions for lab materials are a nightmare at UPRH, outside of ADVANCE-IT program.
4. General administrative support is lacking if you are not in the Program.
5. Cleaning and maintenance are a big hurdle to research activities.

She mentioned the following **barriers** to research in UPRH:

1. Lack of funds and adequate infrastructure.
2. University Policy limiting UPRH to undergraduate studies undermines research activity at the Institution.

Both, male and woman researchers don't have information concerning any changes in institutional policy to benefit research during the past four years.

In terms of general **recommendations**, he suggested:

1. Reduce workloads to researchers.
2. Computerized access system to labs, so that person in lab is responsible for whatever happens; not only the professor.
3. Improve faculty recruitment processes.

She **recommended** the following:

1. The Program should try to include third and fourth year student tutorship, as part of the ADVANCE-IT program.
2. There is a need of new workshops for women needs; particularly to better balance the double jobs they have: home and work.

She expressed that she has been fortunate to have the Program's support in her rank promotion process. They are both full professors. In leadership positions, she has been designated by the Chancellor to be President of the Institutional Research Committee at UPRH. (See Table I). He has had two leadership positions as Coordinator of a Departmental Committee and Coordinator of a Student Organization Campus-wide. She has been PI for a Project and he has been Co PI. In publications, he has 15 peer review journal publications, while she has none. He has 11 publications submitted and has more than 40 Conference Proceedings. She does not have peer review publications, and has had 6 conference proceedings. In fact, last year, she was honored to be the Industry Technology Annual Conference keynote speaker in Humacao.

When comparing this third pair; they both have been "walking the talk". Both have had leadership positions, but he outnumbers her in peer review journal publications and conference proceedings. (See Table I). Again, as in the first pair, it appears ADVANCE-IT arrived a little late in her scientific career. Nevertheless, projections for her future advancement are real, because of the Humacao industrial community recognition of her work, her experience as President of the Institutional Research Committee and her PI work.

The **fourth and last pair of researchers** are well informed of the program's purposes and general benefits. He has had students that have been able to assist to conferences outside Puerto Rico. The female researcher used to have educational grants approved, but when ADVANCED arrived at UPRH she returned to research in her field of study, which is what she prefers the most.

She mentioned the following **strengths** of ADVANCE-IT:

1. Funds are accessible. You don't need to have a very competitive proposal.
2. Lots of support of trips to seminars, and workshops.
3. Acceptance of qualitative research.
4. Promotion of research.

The **weaknesses** mentioned by her include:

1. Lack of a Marketing Plan of the Program, even in UPRH.
2. Men are not part of the Program. They have some similar problems, as women.
3. There is no mentorship program.
4. Establishment of Interchange Program for researchers.

He mentioned the following **problems** in UPRH research:

1. Lack of financial resources.
2. Lack of adequate research space.

He made a **recommendation** for the future:

1. Teaching should not be in competition with research. There should be a better balance between the two.

Her **recommendations** are summarized bellow:

- a. Workloads should be more flexible.
- b. Library should provide articles, journals, and technological infrastructure.
- c. Professors should have computer literacy.

The **barriers** for research, were summarized by the woman faculty:

1. Lack of a research policy .
2. Lack of flexible itinerary.
3. Heavy teaching workload.
4. Library renovation.
5. Technological improvements for researchers and professors.

She has been in **positions of leadership** in community organizations and is Executive Director of a community based organization, while he has only been President of an ad-hoc Department Committee. (See Table I). He has not had any leadership positions outside the Campus. He has not brought any external funds, has not published at all. She has brought 4 projects with external resources, and is PI of one and coordinator for the others. She has not published in peer review journals, but has made 9 conference proceedings. Both believe there have not been any change in policies or procedures that can strengthen research at UPRH.

In this case, apparently **she has been more productive** than the male researcher. They are both Assistant Professors. But, she has brought external funds and is PI of one project. None of them have publications in peer review

journals, but she has had over 9 conference proceedings and instructional modules, while he has none. She is also a leader in community based organizations. He has not had any leadership position in or out of the institution.

In **evaluating the four pairs** of female and men researchers; the first and third pairs reflect that men researchers overleap women researchers; while in pairs two and four, women researchers stand out over men researchers. This conclusion is directly related to the number of years of working experience at UPRH. The first and third pairs have been at the Institution for more years, while pairs two and four have been at the Institution from five to seven years, at the most. The women in these two pairs (second and fourth), have had ADVANCE-IT benefits, very early in their scientific careers, so it has had a remarkable impact, as their productivity indicators reflect in Table I.

Strategic Situational Analysis based on Program Participants Perceptions

In this section of the evaluation, an integrated perception of the Program's **strengths and weaknesses** is presented. Second, a list of **barriers mentioned** by the nine female researchers is quoted. Third, general **recommendations** for future development of research in UPR H is summarized.

Summary of Program's Strengths by Program Participants

1. The Program is a Center for interdisciplinary work with faculty and students alike.
2. It fosters collaboration and professional interrelationship with peers inside and outside the Institution.
3. There is a supportive research environment.
4. Proposal writing advise and counsel is available, when needed.
5. There is wide support for reducing academic workload and for the rank promotion process.
6. The program gives an overview to new faculty members of the whole campus, in terms of its research growing pains.
7. The Program provides promotion of research.
8. There is acceptance and fostering of qualitative research.
9. Each Semester's Final Report becomes another developmental activity for the researcher.
10. The Program's PI and Co PI are supportive and fully understand women's situation in research.
11. There is flexibility, vitality and direct communication with PI and Co PI, through efficient processes.
12. There are excellent workshops on pertinent topics for women in research.
13. Workshops are considered a great help, and a networking opportunity to establish professional relationships with women researchers from other universities in and out of Puerto Rico.
14. Workshops also help and support the rank promotion process.

15. Excellent quality of the Poster Presentations, through ADVANCE-IT sponsorship.
16. There are follow-up processes and stimuli, so women researchers get motivated to make presentations in and out of Puerto Rico.
17. New professors are introduced into the campus life, the structural organization mishaps, and present problems.
18. It provides excellent administrative and financial support to the researcher in requisitions for: lab space, tools and instruments.
19. The Program provides financial support for participation in seminars and conferences outside of PR.
20. Funds are accessible as seed money to the researcher.

Summary of Program's Weaknesses by Program's Participants

1. The Program should have developed an Exchange Program with other Universities for its researchers.
2. There is no mentorship program and it would have helped a lot.
3. The Program is only directed to faculty and not to students directly. It would have been even more successful if both students and professors could have been in the Program.
4. Researcher men are not part of the Program. They have some similar infrastructure problems, as women do.
5. There is still a need to offer other workshops in themes related to women special needs such as: Efficient Use of Time, how to establish priorities between family and research responsibilities and Presentation Skills.
6. There is a need to provide more interdisciplinary research work within the Organization.
7. There is lack of a solid marketing of ADVANCE-IT Program at UPRH and the rest of the UPR campuses.
8. The Educational Coordinator left the Program, and has not been substituted.
9. Advance should seek support from other campus units to push the UPRH administration to provide more space for research in social and natural sciences.

Summary of Institutional Barriers that Need to be Overcome to Excel in Research

1. UPR Policy limiting UPRH to undergraduate studies undermines research activity at the Institution and future academic and research developments.
2. Lack of a formal institutional research policy.
3. UPRH institutional bureaucracy stops or prevents research initiatives.
4. UPRH executive administration does not support research.
5. There is a heavy teaching workload at all departments.
6. Lack of advise in proposal writing.
7. Lack of flexible itinerary for researchers.

8. Library is obsolete. There are no electronic journals. In general, the Library lacks basic research resources, which hinders research work.
6. Lack of technological improvements for researchers and professors.
7. Very limited physical research facilities.

General Recommendations for Future Development of Research in UPRH

1. Approve an institutional research policy that is independent of the undergraduate status of UPRH.
2. Reduce academic workloads to three credits per semester.
 - a. Teaching should not be in competition with research. There should be a better balance between the two.
 - b. Academic workloads should have more flexible workloads for researchers, and a better balance between teaching and research.
3. Strengthen the Visiting Professor Program.
4. Support student participation in research and student tutorship.
5. The Program should try to include third and fourth year student tutorship as part of the research support program.
6. There is a need of new workshops for women needs; particularly to better balance the double jobs they have at home and at work, and new workshops in computer literacy.
7. Professors should have computer literacy.
8. Improve faculty recruitment processes.
9. Library should provide articles, journals, and adequate technological infrastructure to foster research.
10. Create a permanent External Research and Development Office.
11. There is a need for an appropriate amphitheater for conferences and seminars.
12. Renovate and increase laboratory's physical space.
13. Change requisition processes for materials and lab chemicals. Consider the use of Institutional credit cards.
14. Provide computerized access system to labs, so that each person in a laboratory is responsible for whatever happens; not only the professor.

Analysis of Research Productivity Indicators

Table II describes the principal research productivity indicators, for the group of nine women researchers. As can be seen, five out of nine researchers have had at least one leadership position. In terms of external funding, only three researchers have funds ranging from \$30,000 to \$1.4M. Five of the nine researchers have been PI's, one has been Co PI and three have not had this type of responsibility.

Only one of the researchers has had submitted two proposals but were not approved. Five of the female researchers have peer journal publications, while four haven't still had this type of publication. Four of them have submitted

publications, but still not approved. Four of them have articles prepared and are ready to be published. The most important contribution in exchanging knowledge derived from a research project, has been participating at conference proceedings. In terms of Academic Rank distribution, there are four full Professors, one Associate Professor, three Assistant Professors and one Student.

This data tends to indicate, that there are lots of areas of opportunities to improve research productivity at ADVANCE-IT UPRH Program. Nevertheless, even though up to the present time, **external funding** has been low; the high participation in **conference proceedings** (eight out of nine researchers), the **peer journal publications** (five out of nine researchers) and the high proportion of women having had experiences as **Pi or Co PI** (six out of nine researchers); are definitely a good critical mass to keep strengthening research in ADVANCE-IT UPRH. After five years of encouragement and support through ADVANCE-IT; there is a clear indication that in the very near future, higher levels of research productivity in UPRH, can be positively expected.

Returning to the Evaluation Logic Model (Appendix II), initial ADVANCE-IT UPRH outputs and outcomes are already upfront. It is expected that the next two years will be of greater achievements in female research productivity, based on the data previously analyzed.

Program Participants Perceptions on Goal Attainment

Table III is a composite of the nine women researcher perceptions on Program's Goal Attainment. A scale on the level of attainment was established as follows:

Goal initiated	1
Goal in process	2
Goal completed	3

After applying the scale, it can be observed, that the highest accumulated points, which imply the highest level of attainment is for Goals # 1, (Increase women faculty in leadership positions), and # 2, (Increase women faculty with active and funded research projects), with a percentage of 76.2% and 75%, respectively. Then, Goal # 5, (Promote awareness of gender discrimination), with a percentage of 74.1%, and finally Goal 4, (Identify problems faced by faculty women that prevent their advancement), and Goal 3, (Increase recruitment of women in sciences), with a percentage of 66.7% and 59.3%, respectively.

As can be seen at the Table III, two of the professors didn't evaluate some of the Goals. They expressed they didn't have enough information to accurately evaluate attainment of some of the goals. Other professors explained their

answers were directly related to their personal experiences and another one said, she evaluated exclusively looking at the action verbs of each goal.

Nevertheless, this data implies that the Goal Attainment Perception Level of the faculty interviewed is below expectations, practically speaking in all the Goals; but specially for Goals 4 and 3; which were below 70%. Probably, the message behind these low numbers, is related to the Marketing of the Program. Probably the Program needs to provide the faculty with data and information related to the Program's Goal progress in a more formalized and direct way.

Comparative Analysis of Program's Goals, Expected Outcomes and Faculty Goal Attainment Perception Level

Since the Goals did not include quantitative objectives or specific evaluative measures; a comparison was performed between the Goal Attainment Perception Level and the Expected Outcomes of each Goal, as laid out at the original ADVANCE-IT Evaluation Plan. (See Table IV). The first two columns present the Goals and the related Expected Outcomes. The third column summarizes the perceptions on Goal Attainment. The underlined sentences emphasize that the Expected Outcome was not achieved.

Based on this analysis, Goal 5 and Goal 1 do not achieve their Expected Outcomes. In Table III the Perception of Goal Attainment for these two Goals had the highest level of achievement (74.1% and 76.2%, respectively). Goal 2 and Goal 3, achieved only one of two Expected Outcomes. Finally Goal 4, could be considered the only one that had the highest achievement of Expected Outcomes, while in the Perceived Achievement it was rated fourth. In conclusion, there is no direct relation between the Perceptions of Level of Attainment and achievement of Expected Outcomes.

Based on this lack of apparent relation between those two measures; the quantitative data from the Internal Evaluation NSF Kit #1, Baseline Data Analysis; was examined. The purpose of this third analysis was to try to find reliable explanations for the differences in levels of achievements. In this last analysis, it was found that:

1. There is no significant change in the number of women faculty in science in UPRH. This data **impairs** Expected Outcome # **3.2**.
2. There is an increase in the number of women faculty in science with full Professor or Associate Professor Rank. This implies Expected Outcome # **1.2** is **starting** to be **achieved**.
3. Men faculty have the highest proportion of tenure and tenured track positions. This **undermines** Expected Outcome # **3.2**.
4. Through years 1998 to 2005, the amount of women in science being promoted has not increased considerably. This **impairs** Expected Outcome # **1.2**.

5. Nevertheless, when a comparison is done of the percentage of tenure promotions before and after ADVANCE-IT, there is a considerable increase of women in science with tenure promotions. The percentage difference between men and women, before ADVANCE-IT was of 30%, and after ADVANCE-IT is of only of 4 %. With this data, Expected Outcome **3.2** is **achieved**.
6. When comparing percentage of women and men in administrative positions, from years 1997-98 to 2004-2005, men surpass women in all years studied except the last one. This indicates that Expected Outcome **1.2** is **starting** to be **achieved**.
7. The allocation of resources for science faculty is higher for men than for women on all years studied. The last three years (2002-2005) have started to level at almost 50%. It might indicate that Expected Outcome **2.2** is **starting** to be **achieved**.
8. There is no difference in salary distributions among women and men for the last two years for the Professor and Associate Professors academic rank. Again, apparently Expected Outcome **1.2** is **starting** to be achieved.

Based on this three different data banks, presumably the changes expected of ADVANCE-IT program, are starting to be perceived, sensed and documented in its last year of implementation. The deduction or inference that things are starting to change is based on the belief that positive implications of this type of program, require changing highly embraced macro and micro social gender discrimination attitudes and actions; which is a highly complex and further compounded dilemma. The ADVANCE-IT UPRH Goals will probably take more time to be achieved, than the official grant period NSF awarded. Undoubtedly, the data analyzed tends to indicate there are early signs and symptoms that things are changing into a more equal gender workplace for researchers in UPRH.

CONCLUSIONS AND RECOMMENDATIONS

In all organizational endeavors, there is an increased need for accountability and for improved performance. ADVANCE-IT UPR H program is no exception to this rule. Therefore, the tools, ideas and evaluation processes discussed in this external evaluation should be integrated into a periodic systemic view of the Program and at the same time, as a tool for continuous improvement.

From the data collected and information derived from the structured interviews it can be concluded that:

1. ADVANCE-IT UPRH efforts for the past five years has created without any doubt, the foundation for improvement and advancement of women in

- science. There are important processes in place that nurture a climate of collaboration and interdisciplinary work and this is an important quality marker. The best example is precisely the PI and Co PI; one from physics and the other one from Social Sciences working together to reduce gender discrimination in all fields of science in UPR H. In addition, outputs have been registered through the productivity indicators, and initial outcomes are starting to level the disproportionate imbalance pictured in 1997-98. Figures for 2005 are starting to show new directions which imply advancement of women has started at a slow pace, but a very steady and stable one.
2. All of the researchers interviewed knew of ADVANCE-IT existence, purpose, and quality. Nevertheless, most of them felt uncomfortable to evaluate the level of achievement of Goals. On the other side, all said, they didn't know of any changes in policy that may reduce the barriers to research. This underscores the fact that there is a need for a formal communication process or a marketing plan designed to promote the Program, its achievements and future plans.
 3. Both Program participants and male researchers not participating; clearly articulated and identified similar barriers to research, parallel problems and recommendations for improvement. The only difference is that participants have had like a special track in which those weaknesses or limitations are not present any more.
 4. One of the most important barriers that needs immediate action is the UPR System policy which limits UPR H to undergraduate status and the lack of a clear institution-wide research policy that takes into account reduction in academic workloads for productive researchers. The UPR H Institutional policy is contrary to natural growth and evolution of systems and organizations. There is a momentum to increase research at UPR H that no norm or policy can stop.
 5. There is an important critical mass of committed researchers that are pioneering to create better balance between course load and research production.
 6. After five years of hard work and struggle; in 2005 we are starting to perceive a change in statistics and data related to women in senior and leadership positions, in funded research for women faculty, and in advancement or promotion of women to higher ranks and academic preparation. There is a general awareness of gender discrimination, but still there is lots to do in order to move faster in this area.
 7. The mentorship program needs to be created as a reflexive practitioner philosophy to allow for innovation and new ventures to excel in research productivity and quality.
 8. There is a need to clarify the measurable objectives for the future development and evaluation of the Program.
 9. Lastly, there are high expectations of a better future for women in sciences in UPR H. The data analyzed points in that direction: More women in sciences, more women in senior and leadership positions, more

- women with funded research, and more women recruited through tenured track positions. Also, the identification of problems faced by women faculty is under constant revision and update.
10. There is also, a greater awareness of gender discrimination that prevent women from advancing in their scientific careers and promote institutional transformation in that clear direction.

The recommendations are presented as a starting point for more profound strategic conversation, that should be visited periodically.

1. Develop a full profile of a successful researcher independent of gender, by studying and benchmarking with other similar organizations.
2. Prepare a marketing Plan or a Communication Plan to better keep informed internal and external stakeholders of the new developments, accomplishments and impact expected, with the in increase of women In sciences.
3. Create an informal day every three months to dialogue internally and with external interested parties, to develop new options and alternatives to improve women in sciences at UPR H.
4. Promote a supporting climate for research, celebrate the successes and bury the risks gone array. But keep on taking calculated risks in new ventures and alternate possibilities.
5. Develop workshops in leadership competency development, ethics in research and quality improvement philosophy for program participants.
6. Develop a climate survey to understand factors that hinder and factors that promote research productivity.
7. Prepare an Institutional-wide Operational Plan to overcome the weaknesses and barriers identified and to consider alternatives for the recommendations presented by the female and male researchers.
8. Keep the internal and external evaluation system in place to continuously review achievements and also unsuccessful adventures or risk taking opportunities.

In closing or summing up, keep an open door philosophy for searching new solutions, and strategies for future funding of the Program. Define key points stressing the importance of advancing women in sciences and the value added for the whole campus benefit of this initiative.

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APPENDICES

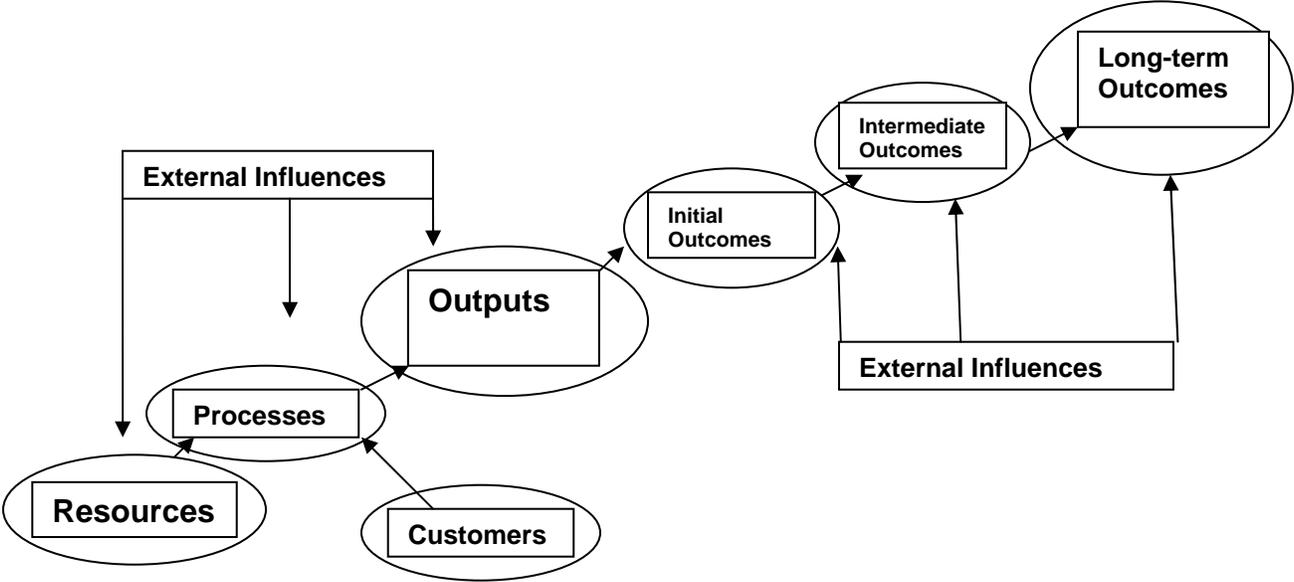
APPENDIX I

ACTIVIDADES	RESPONSABILIDAD	FECHAS
1. Diálogos iniciales para conocer las necesidades del proyecto y plantear posibilidades de contratación.	Prof. Sarah Benítez	Marzo a Mayo 2005
2. Reunión introductoria a los propósitos de la evaluación del Programa ADVANCE.	Prof. Sarah Benítez, Prof. Idalia Ramos y Prof. Elena Batista	3 de Junio 2005
3. Participación en reunión para diseñar el Segundo Sistema de Evaluación de los Programas ADVANCE en Nuevo México.	Prof. Elena Batista Valentín	5 al 8 Junio 2005
4. Reunión para diseñar el Plan de Trabajo de la Evaluación, a la luz del modelo de Evaluación del Desempeño de Poister (2004)	Prof. Idalia Ramos, Prof. Sarah Benítez, Félix López Prof. Elena Batista	14 de Junio 2005
5. Elaboración del Plan de Trabajo y envío a Directora, Co-Directora y Asistente de Investigación	Prof. Elena Batista Valentín	14 de Junio 2005
6. Completar la revisión del Sistema de Evaluación 2004 (Tool Kit #1) y el Sistema de Evaluación 2005 (Tool Kit #2).	Prof. Idalia Ramos, Prof. Sarah Benítez, Félix López Prof. Elena Batista	14 de Junio al 14 de Julio 2005
7. Diseño de Instrumentos para Entrevistas Estructuradas y Diálogo con dos Investigadores y envío a Directora, Co-directora y Asistente de Investigación.	Prof. Elena Batista	14 de Junio al 14 de Julio 2005
8. Iniciar recopilación de información del Tool Kit #1 y preparar inventario de información pendiente de recopilar, y dificultades encontradas.	Félix López	14 de Junio al 14 de Julio de 2005
9. Reunión para dialogar sobre reacciones a los Sistemas de Evaluación 2004 y 2005 y a Instrumentos para Entrevistas y para diálogo con dos profesores.	Prof. Idalia Ramos, Prof. Sarah Benítez, Félix López Prof. Elena Batista	14 de Julio 2005
10. Completar la recopilación de información del Tool Kit #1.	Félix López	14 de Julio al 19 de Agosto de 2005
11. Llevar a cabo entrevistas individuales y diálogo con dos profesores.	Prof. Elena Batista	16 al 19 de Agosto de 2005
12. Revisión de Informe sobre el Análisis de Productividad y Estudio sobre Cambios en Procedimientos.	Prof. Idalia Ramos, Prof. Sarah Benítez, Félix López	16 al 19 de Agosto de 2005
13. Elaborar Informe integrado sobre	Prof. Elena Batista	22 de Agosto al 2

<p>los hallazgos principales de:</p> <ul style="list-style-type: none"> • las entrevistas a Profesoras, • el diálogo con Profesores, • las tablas del Sistema de Evaluación 2004, • el Análisis de Productividad y el • Estudio sobre Cambios en Procedimientos. 		de Septiembre de 2005
14. Participación en Reunión sobre el Sistema de Evaluación 2005 en Irvine, San Francisco	Prof. Elena Batista	4 al 7 de Septiembre de 2005
15. Revisar Sistema de Evaluación 2005, para determinar la información del Sistema 2005, que se pueda recopilar e incluir en el Informe Integrado.	Prof. Idalia Ramos, Prof. Sarah Benítez, Félix López Prof. Elena Batista	6 al 9 de Septiembre de 2005
16. Revisión de Informe Integrado para incluir información del Sistema de Evaluación 2005.	Prof. Elena Batista	12 al 15 de Septiembre de 2005
17. Prof. Idalia Ramos, Prof. Sarah Benítez, Félix López y retroalimentación a la Prof. Elena Batista Valentín.	Prof. Idalia Ramos, Prof. Sarah Benítez, Félix López	19 al 23 de Septiembre de 2005
18. Revisión del Informe Integrado de Evaluación del Programa ADVANCE.	Prof. Elena Batista	26 al 28 de Septiembre de 2005.

APPENDIX II

Poister (2003) Program Evaluation Logic Model



APPENDIX III

EVALUATION PRACTICES UPR-H ADVANCE-IT

1. Description of UPR H ADVANCE program Advisory Board of Directors including functions and sector represented.

The role of the external Advisory Board is to contribute to the assessment of ADVANCE's strategies and accomplishments and to help plan for the sustainability of the Advance Program beyond the funding period. The members are well recognized experts from different fields in Puerto Rico and the USA mainland and knowledgeable of the particularities of UPRH and Hispanic women in science. The members are Daniel Altschuler, a Senior Research Associate and former director of the Arecibo Radio telescope in Puerto Rico; Helen Davies, a Professor Microbiology from the University of Pennsylvania, former AWIS president, and lifelong advocate for women in science; María D. Fernós, Puerto Rico Women's Advocate, Angela Ginorio, Associate Professor of Women Studies, University of Washington; María Pennock-Román, MPR-Psychometric and Statistical Research Consulting; and Janice Petrovich, Director Education, Knowledge, and Religion Education, Media, Arts, and Culture Program of the Ford Foundation. The board meets once a year in Puerto Rico during the ADVANCE Annual Meeting and submit a report to the PIs.

2. Identify comparable institutions in or out of the NSF present Awardees: Primarily Hispanic Institutions offering similar Academic Degrees.

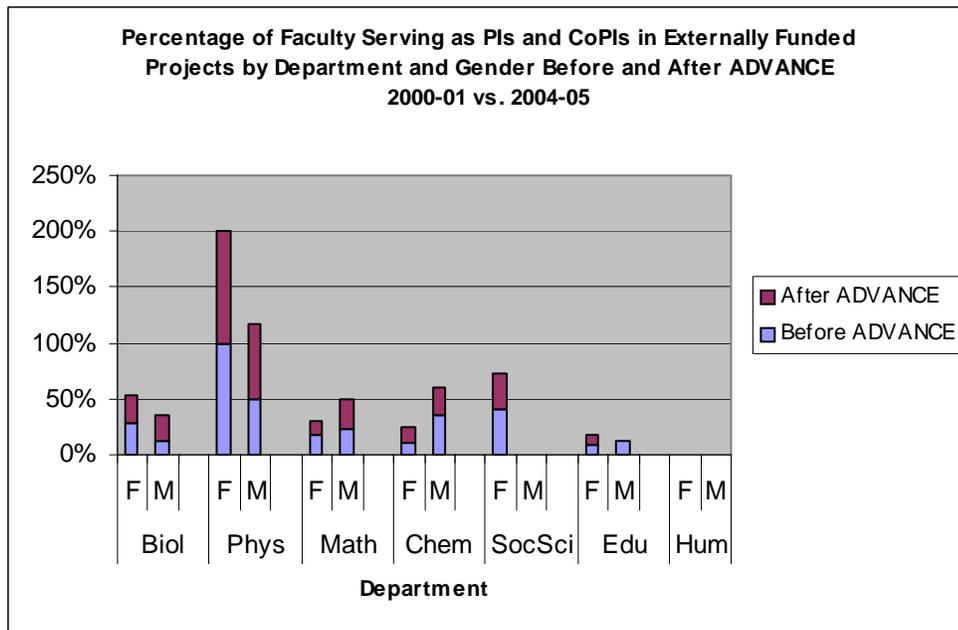
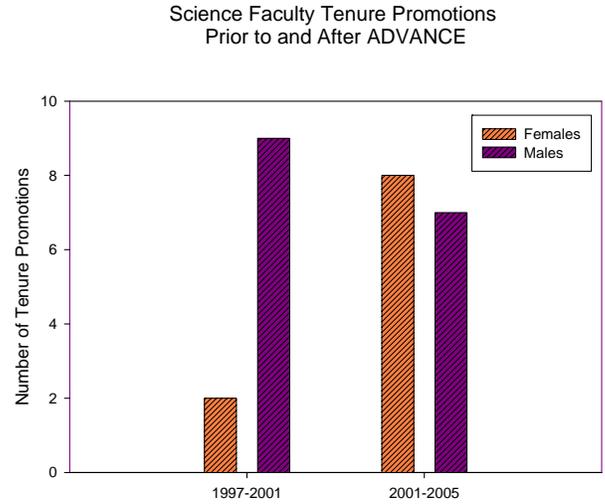
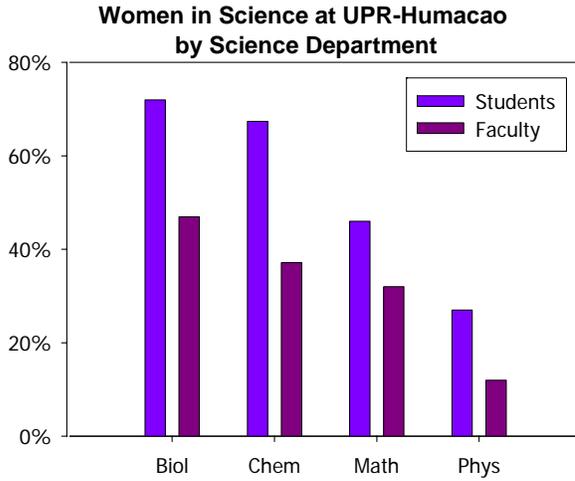
New Mexico State University

The University of Texas at El Paso

California State University at Los Angeles

3. Description of experience using internal evaluators, external evaluators and Advisory Board of Directors. Include strengths and weaknesses (See Table)

4. Typical graphic representations of the information submitted by UPR H ADVANCE-IT to NSF.



Evaluation Practices at ADVANCE Institutions

	Internal Evaluators	External Evaluators	Advisory Boards
Frequency of Evaluation	1. Satisfaction evaluation that is done for each of the educational/training activities	There are various levels of evaluation: 1. Process evaluation done yearly. 2. Effectiveness is currently being done (once).	One report per year
Reporting	Evaluation reports of educational and training activities are submitted to PI and CoPI to help plan future activities. Since the beginning of the program 12 of these reports have been submitted.	In October of 2005 we will have an evaluation meeting to integrate and analyze comprehensively, the Effectiveness study, the Kit #1 statistics, the Productivity Study and the Policy Analysis; being prepared also by an external lawyer.	Evaluation reports are used to review and develop plans and for strategic decisions. Information serves as feedback to participants, and staff. Reports are provided to the administration and NSF. One of these reports has been prepared.
Dissemination of Results	PI and COPI	NSF, ADVANCE Staff, participants and administration	NSF, ADVANCE Staff, participants and administration
Level of Satisfaction	Satisfied with the results of the workshops participant's satisfaction evaluation.	Although the effectiveness component is still not finished, we are very satisfied with what is being done.	Very satisfied.
Strengths	Provides important feedback at the end of each educational activity. This is helpful to promptly introduce modifications to future activities.	The integration of the four evaluations: program activities, process evaluation, policy and effectiveness of the Program (results and impact) will provide a comprehensive view of the whole program.	Team work that provides different perspectives.
Weaknesses	Some participants prefer not to express their opinion.	Need to include qualitative methods and techniques.	Provide support and resources so that they can complete written reports within a short time after their evaluation. Sometimes they can take a long time in presenting their report.

Pros	Better understand faculty professional development needs, which helps in providing workshops really needed.	Provides a fresh and objective perspective.	Members are well recognized experts and can speak with authority to the administration and university community. They provide support and help plan for sustainability of the program.
Cons	None	Takes more time for the evaluator to understand the program and the dynamics of the organization.	None
Logistic Requirements (preparations, lead time, FTE, etc)	Design the evaluation instruments, process data and analysis and interpretation.	Set up monthly meeting. Need a .5 FTE to provide data, keep communication, and prepare meetings.	Takes more than two weeks to set up the visit. Usually requires 1.5 FTE for two to three weeks. Also includes faculty participants at least 2 days to review and print posters for presentations plus at least 3-4 hours of their time for personal interview and lab visit with the board members. PI and Co PI put in two full days with board members.
Cost	Inkind	\$15K per year	\$5K per year (travel costs to meeting)

APPENDIX IV

**STRATEGIC CONVERSATION FOR CRITICAL REFLECTION
ON PROGRAM'S OUTCOMES AND EFFECTIVENESS:
ADVANCE Institutional Transformation, UPR-HUMACAO
Women Researcher Interview Questionnaire**

1. Why were you interested in participating in ADVANCE-IT UPRH Program?
2. What are its principal strengths?
3. What are its principal weaknesses?
4. What value added or benefits have you had in UPRH to advance your science career, during the past five years?
 - a. Describe the leadership positions you have held in UPRH. Explain.
 - b. Have you been able to bring external funds in the last five years to UPRH?
 - i. Indicate the number of projects _____
 - ii. Indicate the type of project
_____ Research
_____ Education
_____ Service
 - c. ¿What has been your principal responsibilities in these projects?
_____ Principal Investigator
_____ Co Principal Investigator
_____ Other, explain _____
 - d. Indicate the approximate amount of external funds, you have brought to UPRH. _____
 - e. Indicate the number of Proposals you have submitted during the past five years, which were not funded _____
Explain.

f. Indicate the type and number of Publications you have made during the past five years.

_____ Articles published in peer review journals.
_____ Approved articles in peer review journals.
_____ Submitted articles in peer review journals.
_____ Articles in preparation.
_____ Conference Proceedings.
_____ Others (Explain)_____

g. Have you been promoted during the past five years? Please explain the number of years it took for each promotion.

h. Is there any other information that evidences your active research productivity in natural or social sciences, during the past five years.

5. Are there any barriers which hinder the improvement of ADVANCE it?
6. What Institutional Policies for Women Advancement have been approved because of ADVANCE- IT existence?
7. Is there any other recommendation you wish to include to improve research in the natural or social sciences in UPRH?
8. What strategies and activities should we keep after ADVANCE-IT funds are finished?
9. In general, what would you change of this experience in ADVANCE-IT; in order to enhance women participation in the sciences?
10. Is there any other recommendation you may think of, to improve this Program and increase women participation in the natural or social sciences?

11. What is your perception on the level of achievement of ADVANCE-IT Program Goals?

GOALS	Initiated	Significant Improvement (Give evidence)	Completed	Observations
1. To increase the number of women faculty with senior and leadership positions in the natural and social sciences in UPRH.				
2. To increase the number of women faculty, in science with active and funded research projects in UPRH.				
3. To increase the recruitment of tenured and tenured track women in the sciences.				
4. To identify problems faced by the faculty women at UPRH, that prevent them from advancing to higher positions in the academe and compare them to other UPR units, and other universities in PR and with other universities in the mainland.				
5. To promote awareness of gender discrimination that prevent women faculty in advancing in the academe and establish and institutional transformation to address their needs.				

APPENDIX V

**STRATEGIC CONVERSATION FOR CRITICAL REFLECTION
ON PROGRAM'S OUTCOMES AND EFFECTIVENESS:
ADVANCE Institutional Transformation, UPR-HUMACAO
Men Researcher Interview Questionnaire**

12. Do you know the purposes and achievements of ADVANCE-IT in UPRH?
13. What is your perception of its performance?
14. What value added or benefits have you had in UPRH to advance your science career, during the past five years?
- a. Describe the leadership positions you have held in UPRH. Explain.
 - b. Have you been able to bring external funds in the last five years to UPRH?
 - i. Indicate the number of projects _____
 - ii. Indicate the type of project
 - _____ Research
 - _____ Education
 - _____ Service
 - c. ¿What has been your principal responsibilities in these projects?
 - _____ Principal Investigator
 - _____ Co Principal Investigator
 - _____ Other, explain _____
 - d. Indicate the approximate amount of external funds, you have brought to UPRH. _____
 - e. Indicate the number of Proposals you have submitted during the past five years, which were not funded _____
Explain.

f. Indicate the type and number of Publications you have made during the past five years.

_____ Articles published in peer review journals.
_____ Approved articles in peer review journals.
_____ Submitted articles in peer review journals.
_____ Articles in preparation.
_____ Conference Proceedings.
_____ Others (Explain)_____

g. Have you been promoted during the past five years? Please explain the number of years it took for each promotion.

h. Is there any other information that evidences your active research productivity in natural or social sciences, during the past five years .

15. What problems limit your development as a scientist and increase in your research projects and publications?

16. What institutional policies have changed in UPRH that have contributed to improvements in research, in the natural and social sciences in UPRH ?

17. Is there any other recommendation you wish to include to improve research in the natural or social sciences in UPRH?