ACTION RESEARCH: AN APPROACH FOR THE TEACHERS IN HIGHER EDUCATION

Yasmeen, G.
Ghazala Yasmeen
Dept. of Physiology, University of Karachi. Karachi 75270, 0092-021-9261300-5 EXT 3458
ghazala_1980@yahoo.com

ABSTRACT
Introduction: Action Research is a formative study of progress commonly practiced by teachers in schools. Basically an action research is a spiral process that includes problem investigation, taking action & fact-finding about the result of action. It enables a teacher to adopt/craft most appropriate strategy within its own teaching environment.
Objective: The objective of present work is to study the effectiveness & advantage of Action Research at higher education level. Bio-Statistics taken as difficult, dry & non-interesting subjects by most of the biological sciences students was selected for the study.
Methodology: Practical Action Research (one of its mode) was chosen as a scheme of study to address the major problems of these students. Beginning the cycle of Action research, students views were collected & main problem areas was identified. Within our educational environment, solutions (Actions) were implicated & results were evaluated periodically. Each time modifications were made by symmetrical communication to students without any attempt to direct the outcome of deliberate process.
Results: The students' response in form of behavior & class room assessments showed a positive change in their interest & understanding of the subject.
Conclusion: The study concluded that at all educational levels, Action Research can be adopted to improve the teaching/learning outcomes & should also be practiced by university teachers as important educational strategy.
Key Words: Formative Study, Action Research, Practical Action Research

INTRODUCTION

Historical Background: The origins of Action Research (AR) are unclear in the literature but generally Kurt Lewin is considered the 'father' of AR (Kemmis & McTaggert, 1990; Zuber-Skerrit, 1992 & Holter & Schwartz-Barcott, 1993), who first coined the term, in his paper about Minority Problems (Kurt, 1946). Its function in educational system began with the Science in Education Movement of late nineteenth century in which scientific method was applied to education (Masters, 1995) followed by the UK originated Teacher-Researcher Movement advocating that all teaching should be based upon research (McKernan, 1991).

By the mid 1970s, it was discussed as a separate field of research and four major types were reported including: 1) Traditional: that was applied WITHIN organizations in the areas of Organization Development, Quality of Working Life (QWL), Socio-technical systems (e.g., Information Systems), and Organizational Democracy. This traditional approach tends toward the conservative, generally maintaining the status quo with regards to organizational power structures. 2) Contextual: that encompasses relations BETWEEN organizations. It stresses that participants act as project designers and co-researchers. The concept of organizational ecology and the use of search conferences come out of contextual action research. 3) Radical: it has a strong focus on emancipation and the overcoming of power imbalances. 4) Educational Traditional Action Research: A fourth stream, that of Educational Action Research, has its foundations in the writings of John Dewey, the great American educational philosopher of the 1920s and 30s, who believed that professional educators should become involved in community problem-solving. Its practitioners, not surprisingly, operate mainly out of educational institutions, and focus on development of curriculum, professional development, and applying learning in a social context. It is often the case that university-based action researchers work with primary and secondary school teachers and students on community projects (O'Brien, 2001). Initially AR was limited to school settings and practiced by teachers to observe the effect of any teaching strategy modification on focused students or to incorporate progressive changes in the syllabus taking all stakeholders but owing to its flexibility and more practical approach, now it has been experimented at all levels of professional & formal education.

Basic Concept: "Action research...aims to contribute both to the practical concerns of people in an immediate problematic situation and to further the goals of social science simultaneously. Thus, there is a dual commitment in action research to study a system and concurrently to collaborate with members of the system in changing it in what is together regarded as a desirable direction. Accomplishing this twin goal requires the active collaboration of researcher and client, and thus it stresses the importance of co-learning as a primary aspect of the research process" (Thomas *et. al*., 1986) AR is a formative study of progress that is simply "Learning by Doing". Scientifically, it can be described as a systematic inquiry that is collective, collaborative, self-reflective and

undertaken by participants (students, teacher, colleagues or any other stakeholder) in an educational situation in order to improve the rationality of their own educational practices, as well as their understanding of these practices and the situations in which theses practices are carried out, with an aim to contribute to the practical concerns of immediate problematic state, being limited in available resources in accordance with typical classroom circumstances (modified from McCutcheon & Jurg, 1990; Kemmis & McTaggert, 1990 & Rapoport, 1970).

Core Components: There are many ways in which AR can be practiced in a particular setting. It is a cyclical process that never ends but always provides a conclusion with more ideas to bring upon progress and improvement. Whatever the settings and participants are, usually it has been carried out into four consecutive phases.

Fig.1 shows a simple model of the cyclical nature of the typical AR process, each cycle has four steps: Plan, Act, Observe, Reflect (Dan, 1995).

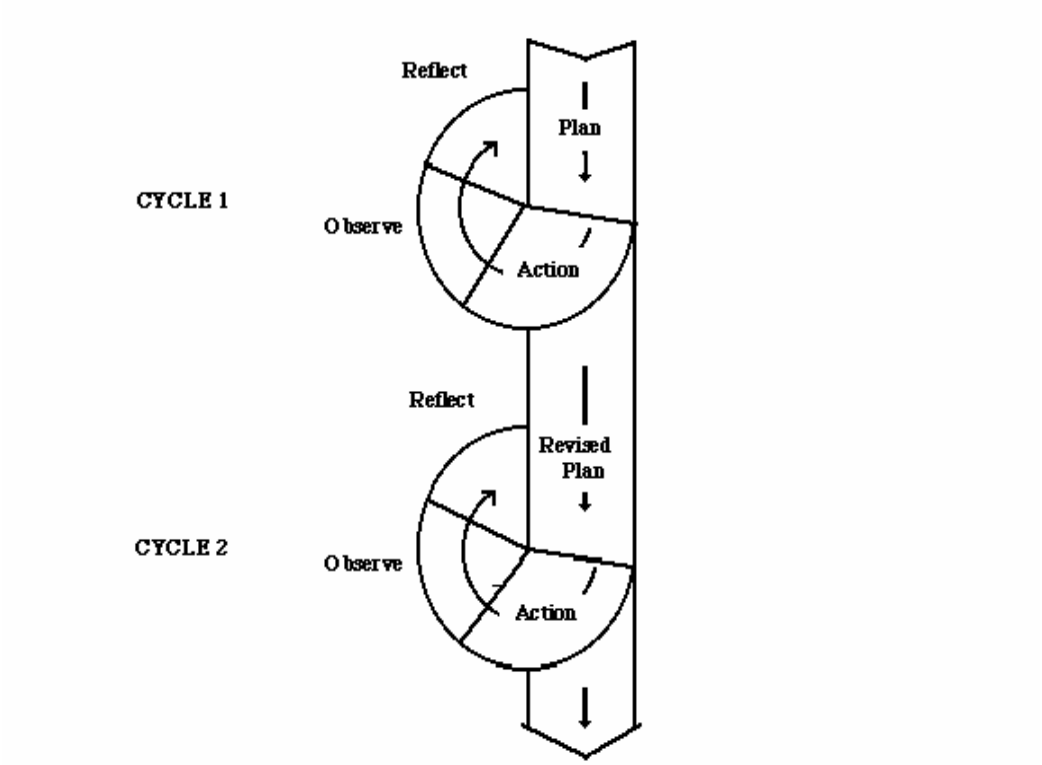

Figure 1: Simple Action Research Model (from Dan MacIsaac, 1995)

Gerald Susman (1983) gives a somewhat more elaborate listing. He distinguishes five phases to be conducted within each research cycle (Fig. 2).

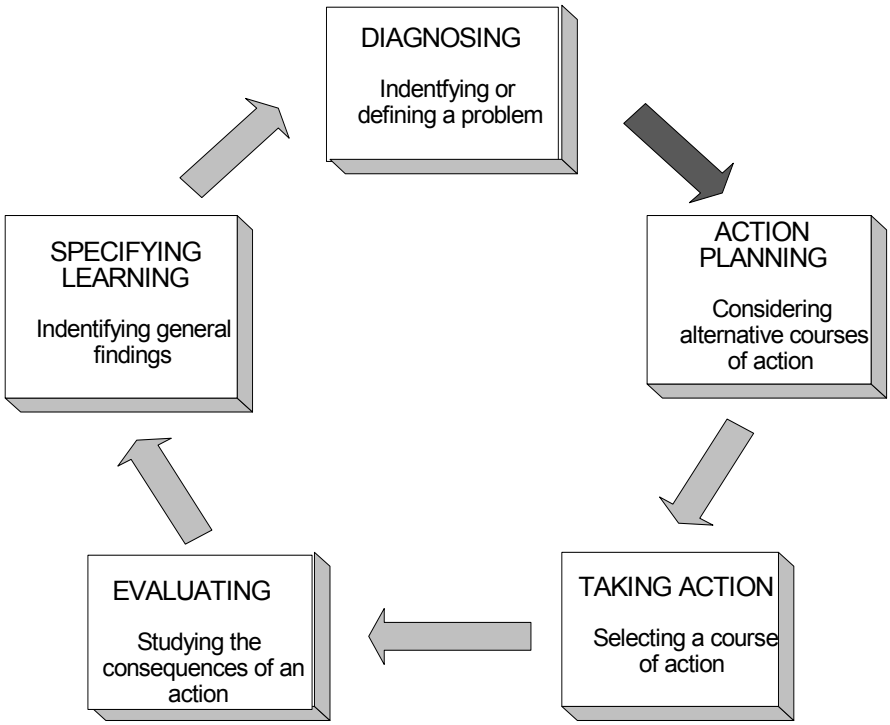

Figure 2: Detailed Action Research Model (Adapted From Gerald Susman, 1983).

Initially, a problem is identified. This is followed by a collective postulation of several possible solutions, from which a single plan of action emerges and is implemented. Data on the results of the intervention are collected and analyzed, and the findings are interpreted in light of how successful the action has been. At this point, the problem is re-assessed and the process begins another cycle. This process continues until the problem is resolved. (Gerald, 1983 & McKay, 1992).

Principles: What gives action research its unique position is the set of principles that guide the research. Richard (1989) provides a comprehensive general overview of six key principles. These can be considered in any of the educational settings.

1) *Reflexive critique:* An account of a situation, such as notes, transcripts or official documents, will make implicit claims to be authoritative, i.e., it implies that it is factual and true. The principle of reflective critique ensures people reflect on issues and processes and make explicit the interpretations, biases, assumptions and concerns upon which judgments are made. In this way, practical accounts can give rise to theoretical considerations.
2) *Dialectical critique:* Reality is consensually validated, which is to say it is shared through language. Phenomena are conceptualized in dialogue; therefore a dialectical critique is required to understand the set of relationships both between the phenomenon and its context, and between the elements constituting the phenomenon. The key elements to focus attention on are those constituent elements that are unstable, or in opposition to one another. These are the ones that are most likely to create changes.
3) *Collaborative Resource:* Participants in an action research project are co-researchers. The principle of collaborative resource presupposes that each person's ideas are equally significant as potential resources for creating interpretive categories of analysis, negotiated among the participants.
4) *Risk:* The change process potentially threatens all previously established ways of doing things, thus creating fears among the practitioners. One of the more prominent fears comes from the risk to ego stemming from open discussion of one's interpretations, ideas, and judgments. Initiators of action research will use this principle to allay others' fears and invite participation by pointing out that they, too, will be subject to the same process, and that whatever the outcome, learning will take place.
5) *Plural Structure:* The nature of the research embodies a multiplicity of views, commentaries and critiques, leading to multiple possible actions and interpretations. This means that there will be many accounts made explicit, with commentaries on their contradictions, and a range of options for action presented. A report, therefore, acts as a support for ongoing discussion among collaborators, rather than a final conclusion of fact.

6) *Theory, Practice, and Transformation:* For action researchers, theory informs practice, practice refines theory, in a continuous transformation. In any setting, people's actions are based on implicitly held assumptions, theories and hypotheses, and with every observed result, theoretical knowledge is enhanced. The ensuing practical applications that follow are subjected to further analysis, in a transformative cycle that continuously alternates emphasis between theory and practice.

Classification: In literature, many researchers have discussed different types of AR. Kemmis & McTaggert (1988) describe it as Technical, Practical (participatory) & Emancipatory. Holter & Schwartz-Barcott (1993) also explain three types: Technical collaborative, Mutual collaborative & enhancement approach. While McKernan (1991) also list three modes of AR: Scientific - technical, Practical – deliberative & Critical – emancipatory. Emily (1993) describes three other modes: Teacher researcher, Collaborative research & School-wide action research. But all modes are more or less interchangeable with similar basic objective of AR.

Practical Action Research: In the present study, Practical Action Research (PAR) mode has been carried out at the university level. It is described with many other names in literature including: participatory AR, Collaborative AR, Action learning etc (O'Brien, 2001). It focuses on improving learning by means of a self-reflecting process, exploring & solving problems (McNiff, 1988). It follows the typical spiral of AR (Mash & Meulenberg-Buskens, 2001) as shown in Figure-2. The researcher (teacher) becomes essentially facilitator or catalyst, and participants (students in this study) become co-learners in PAR; nobody is considered the expert (Walker, 1993). PAR is subjective and therefore not always neutral (Schensul, 1999). PAR requires mutual respect, adaptability, humility, trust & holistic approach to problem solving (Brydon-Miller, 1997).

BACKGROUND OF THE STUDY

The educational action research has been sub-classified into three broad categories which are teacher research, collaborative research and school-wide action research on the basis of major objective, settings, interested audience and impact (Emily, 1993)

The teacher research is focused to bring changes in a single classroom to support the individuals. The results are important for individual teacher and the impact of the study may or may not reach beyond the classroom.

The collaborative research is conducted to cause positive changes in one or more classrooms, levels, team or department to support university, educational service, agency etc. two or more educators are concerned with results and impact extends to grade level or department that reveals potential for partnerships.

On the other side the school-wide action research is focused at school improvement and student learning area of collective interest, supported by school leadership and external agencies or groups. The entire school community is the audience for result and it has the vast impact that gives potential to restructure and change the school.

Apparently the educational practical research has three discrete classes proposed for specific institutional level and need. But for the sake of practical approach, one would find them appropriate for all grades, levels and institutes without any markable distinction. A student in the university classroom may need special attention as a child in school or a dry, difficult, complex text may cause problems of understanding or need modification in the teaching strategy at any level.

The traditional educational research methodologies usually remain unsuccessful when mature students come up with hurdles in studies owing to their limitations as their conclusions are based upon a certain environment which may not be true for the focused group. Secondly the young adults are quite able to propose the solutions for their difficulties and if these are brought into practice they follow and respond it pleasantly. So dealing with the higher level students action research is a good choice which is flexible and modifiable as per situation, hurdles and resources, specially when the students are given importance and they are allowed to not only highlight the barrier but also asked them to coin a possible resolution. This type of AR where every one is supposed to be research participant and equally honored is referred as Participatory Action Research (PAR).

It has been a continuous finding for many years that students who enter the department of Physiology (a subject of Biological Sciences) feel uneasy in the class of Biostatistics. These students are having poor back ground knowledge and for most of them, it's the first exposure to the subject. More over being the students of biological sciences, they are usually weak in mathematical concepts & calculations. And if they are satisfactory with the simple calculations they find difficult to draw conclusions and inferences. Simply to have mathematics again after a break of about four years horrifies them. These factors collectively cause a fear about the subject and they take it a punishment inspite of understanding its usefulness. Even good students of the class do not perform

well. On the basis of previous sessions experiences, problems faced by most of the former pupils along with their remedies are discussed with the students in the introductory class but still the outcome objectives are not fully achieved. So we planned to practice PAR to identify the problems to get their immediately practicable solution compatible with the class construction and environment.

PAR has been used in school settings since long. Currently some universities have initiated research projects regarding teaching strategies based on Action Research. In this connection, the presented work was conducted to evaluate effectiveness of PAR as teaching approach at higher education level.

The objective of present study is to assess the efficacy, advantage and viability of Action Research at higher education level as a part of teaching plan to improve the students learning.

Owing to the salient features of PAR that include mutual respect, adaptability, humility, trust & holistic approach (Brydon-Miller, 1997) with a focal point of improving learning by means of a self-reflecting process, exploring & solving problems (McNiff, 1988), it is hypothesized that it may be proven a good approach to address the learning problems observed in a university classroom.

METHODOLOGY

A total of 45 students from B. Sc. (Honors) – III year took part in the study while studying the course of Bio-Statistics. It was discussed with them in detail the concept and objective of PAR. They are invited to become the part of study and to contribute through ideas sharing for a better outcome. Everyone was told to take himself as a co-investigator and motive for a positive change. Young students happily agreed to take part in the study in which they were the identical partner. Class performance was chosen as criteria to assess the gradual transformation and samples were collected in form of class observation, students' responses collected on a proforma, assignments and class tests.

In the initial classes, students' views about the subject were openly taken. Their misperception of considering it maths was corrected. The significance of subject in future studies especially with respect to the research point of view was explained them. To make it more charming, carriers associated with it were also described. Then the formal textual study began. They easily understood the basic concepts, terminologies & definitions. The advancement to descriptive statistics caused a clear change in class response. Here at this point, first PAR cycle was practiced following all its phases as shown in Table-1 (Adapted from Kemmis & McTaggert 1988).

MOMENT	WHAT'S HAPPENING
OBSERVATION	With the start of Descriptive Bio-Statistics, it was observed that students are losing their attention in the class. When ever a problem was given to solve, they took long time as just to pass the period. Although, home assignments were submitted regularly.
DIAGNOSIS	In the other class, teacher expressed her previous observations frankly with the students & asked them to commit about the situation. They pointed out many areas of problem but the common findings were; i. forgot the formula, ii. Knew the formula but unable to apply correctly & most important iii. The assignments were the efforts of a single group (studied the subject previously) offered to all class.
ACTION PLANNING	Students were asked to propose as many solutions as they can. Different approaches came up for instance rote formulas, write them daily, arrange a separate test, surprise description on board by students etc.
ACTION	All above solutions fulfilled only one requirement i.e. to know formula but how to use it? Finally it was decided & mutually accepted that everyone would write daily discussed formula at the end of note book with two clues "where & how to use". She would recall them each time before opening her note book so mistakes if any could be corrected. Plus everybody would look for more relevant examples & would share with others. Simultaneously, they promised not to cheat themselves again by mere cheating, but to remove their queries & confusions by group discussion or by teacher consultation.
EVALUATION	To evaluate the effectiveness of our solution, assignments were given. This time mistakes were less & not common. That showed, all students were keeping their promise and cooperating. With more varied exemplification, they understood the concept well.
LEARNING	The developing interest reflected that if students are involved in decision making about their ongoing teaching strategy, their learning improved more than anticipated.

Table 1: The PAR Moments by Method (From Kemmis & McTaggert 1988).

OBSERVATIONS

Till the end of chapter, they were doing well with respect to home assignments, class questioning & classroom practice question solving. They appreciated the ACTION and followed it. In the mid of semester, an announced class test was conducted to collect data about their performance. The results were not satisfactory (Fig. 3) and did not reflect their active class performance.

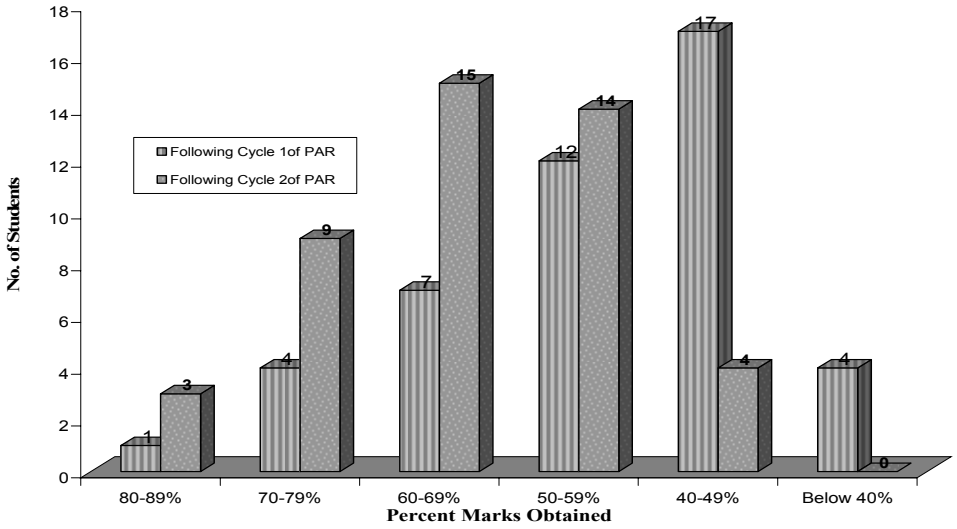

Figure 3: Comparison of Percent Test Marks Obtained by Students following Two Cycles of PAR

With this finding that still there is some problem in the process of learning, the second cycle of PAR was done. Again all phases of spiral were re-practiced. With identification of new problem area, modified or fresh solutions were crafted. Feed back was collected in shape of class test once again that depicted an improvement in the outcomes but still not excellence (Table 2).

Categories of Marks Percentage	Percent of Students Following Cycle 1of PAR (%)	Percent of Students Following Cycle 2 of PAR(%)	Improvement (%)
80-89	2	7	5
70-79	9	20	11
60-69	16	33	17
50-59	27	31	4
40-49	38	9	29
Below 40	9	0	9

Table 2: Effect of Action Research Cycles on Performance of Students as Measured in Form of Class Tests (N=45)

Again a new cycle would be ideal to do but limited time period of semester did not allow it.

FINDINGS AND RESULTS

The purpose of this article is to illustrate how PAR can be used in a university classroom at short level in restricted time period. The students feel pleasure when they are involved in modifications of the teaching & learning strategies. In fact, it works as a strong motive that stimulates students not only to work out the weaknesses and hurdles in the two way process of knowledge impartment but also to look for the appropriate solution. Fig. 3 elaborates its effect on their performance with progression of PAR. The student distribution in the Fig. 3 does not follow the normal distribution. It may be because of class construction or owing to small sample size. As normality increases with the sample size.

On the teacher's side, PAR practice is helpful in two ways. Firstly, it produces knowledge and action directly useful to the group of pupil in a classroom environment with its own features. Secondly, it gives an idea for the teaching planning of the coming class. The problems faced by current students and adopted solutions can be incorporated in next plan.

DISCUSSION

AR is an excellent approach to use in educational system. AR conducted in a classroom provides an accurate insight into pattern of student response and teaching strategies over the entire teaching session, not just a matter of days or two. It seeks to answer questions and solve problems that arise from the daily life of the classroom and to put findings into immediate practice (McKay, 1992 & Twine & Martinek, 1992). It is suitable because of its characteristics: systematic inquiry, reflexivity & focus on the practical as identified by McCutcheon & Jurg (1990). Usually it is driven by the practitioner's desire to improve its own practice with respect to a specific set of students, thus students reap immediate benefits (Williamson, 1992).

Several terms with a little variations on theme are encountered in education literature including: teacher research, teacher-as-scholar, interactive research, practical inquiry, classroom inquiry and practice-centered inquiry (Downhower et al, 1990 & Williamson, 1992). Similarly various modes with the variation in the situations have been discussed.

Among all of its modes, PAR is most appropriate for a university classroom as it involves the mutual collaboration to understand problem and its immediate solution (Holter et al, 1993). Its three primary features: collaboration, mutual education and acting on results developed from basic questions which are relevant to situation, as reported by (Macaulay et al, 1999) make it more reliable. It fosters the development of knowledge by emphasizing the part played by personal judgments in decisions to act for good. PAR is also based on mutually respectful partnership between researcher and students. Ideally, everyone is a co-researcher and should produce input at all levels of research (Mash, 2001).

A side from improvement in students performance (the main objective), they learnt other skills for instance to think about their main problem, to accept their weaknesses, to work out a good practical solution, to review their performance gradually, above of all to present their opinions in a discrete way with logic & to bear criticism. Through open discussion in the class, they learnt the manners to speak in a gathering.

PAR produced a good impact on the class environment and students' opinion about the subject. They enjoyed the strategy of PAR, known by their views collected at the end of semester through a questionnaire.

The PAR is a different approach from conventional research methodologies as it is more flexible. Here the supervisor is only facilitator not the governor. It involves every student in the process of progress. So, every modification in the plan of study is mutually accepted and acknowledged. The various assessment approaches like formative assessment, group discussions, mini projects, counseling and feed back proforma are the tools that help AR. All these approaches only guide to recognize the problematic area but do not offer any remedy for it. On the other side PAR is a sequential plan that not only highlights the bottom line error but also provide a chance to assess the effectiveness of the modification. It can be repeated as many time as possible.

Aside to the fore-mentioned benefits, the approach has its limitations. While involving the young students in such activities, the facilitator has to be very careful to drive the discussion in the right direction, to maintain the healthy class environment where everyone listens other, everyone tolerates others comments calmly and to generate feeling of respect for all. He has to make sure the participation by every student either verbally of in writing. From many of the solutions offered by students, he has to decide opt the appropriate one with some necessary modifications so it could be acceptable for all.

In addition to this, some of the following difficulties that interfere in the evaluation process cannot be ignored. The process requires extensive time in a closely scheduled semester. With consuming more times in discussions & class evaluation (through test, questioning, assignments), the coverage of syllabus became difficult. Teacher had to utilize extra time in students' assessment & data analysis. But these difficulties can be overcome by assigning separate time for such activities or by working out free hours after discussion with students.

The study has its own limitations. It was shared with a small group of students as a pilot project. Its impact can be enhanced by the involvement of other colleagues and expanding it towards the other subjects both theories and labs.

CONCLUSION

PAR is very applicable at higher levels of education. The principles of PAR such as mutual collaboration, reciprocal respect, co-learning and acting on results from the enquiry are all essential in the teacher-student relationship. Designing of PAR projects at departmental level, will help to enhance the learning outcomes progressively.

REFERENCES

Brydon-Miller M. (1997). Participatory Action Research: psychology & social change. J Soc issues, 53, 657- 66.

Dan Maclsaac. (1995). An introduction to Action Research. [On-line]. Available: http://physicsed.buffalostate.edu/danowner/actionrsch.html

Downhower S., Melvin M.P. & Sizemore P. (1990). Improving writing instruction through teacher action research. J. of Staff Development, 11(3), 22 - 27.

Emily C. (1993). Action research: Three Approaches, Educational Leadership, 51(2), 62

Gerald I. S. (1983). Action Research: *A sociotechnical systems perspective.* Edited by G. Morgan, Sage publications, London. Page No.102.

Holter I.M. & Schwartz B., D. (1993). Action Research: What is it? How it has been used and how can it be used in nursing? J. of Adv. Nursing, 128, 298-304.

Kemmis S. & McTaggert R. (1988). The Action Research Reader. Geenlog, Deakin University Press.

Kemmis S. & McTaggert R. (1990). The Action Research Planner. Geenlog, Deakin University Press.

Kurt L. (1946). Action Research & Minority Problems. J. of Social Issues, 2, 34 - 46.

Macaulay A.C., Commanda L.E., Freeman W. et al. (1999). Participatory research maximizes community & lay involvement. Br Med J. 319, 774-778

Mash R.J., Meulenberg-Buskens I. (2001). Holding it lightly: the cooperative inquiry group: a method for developing educational materials. Med. Educ. 35, 1108-1114.

Masters J. (1995). The History of Action Research in I. Hughes. The University of Sydney. [On-line] Available: www.behs.cchs.usyd.au/arow/reader/rmasters.htm

McCutcheon G. & Jung B. (1990). *Alternative perspectives on Action Research. Theory into practice.* volume 24, 144-151.

McKay. (1992). Professional development through Action Research. J. of Staff Development, 13 (1), 18-21

McKernan J. (1991). *Curriculum Action Research. A hand book of methods & resources for the reflective practitioner*. London.

McNiff J. (1988). *Action Research: Principles & Practice*. MacMillan Education Ltd. London.

O'Brien R. (2001). An overview of the Methodological Approach of Action Research. English version [On-line]. Available: www.web.ca/robrien/papers/arfinal.html

Rapoport R.N. (1970). Three dilemmas of Action Research. Human Relations. 23 (6), 499.

Richard Winter, Learning From Experience: Principles and Practice in Action-Research (Philadelphia: The Falmer Press, 1989) 43-67.

Schensul J.J. (1999). Organizing community research partnerships in the struggle against AIDS. Health Educ. Behav., 26, 266-283

Thomas Gilmore, Jim Krantz and Rafael Ramirez, "Action Based Modes of Inquiry and the Host-Researcher Relationship," Consultation 5.3 (Fall 1986): 161.

Twine J., & Martinek T.J. (1992). Teachers as researchers—an application of a collaborative action research model. J. Physical educ. recreation & Dance, 63 (9), 22-25.

Walker M.L. (1993). Participatory Action research. Rehab. Counseling Bull., 37, 2-6.

Williamson K.M. (1992). Relevance or rigor—A case for teacher as researcher. J. Physical educ. recreation & Dance, 63 (9), 17-21.

Zuber-Skerrit O. (1992). Improving Learning and Teaching through Action Learning & Action research. Draft paper for the HERDSA conference 1992. University of Queensland.

