Improving learning and teaching through action research

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Abstract

In this paper, it is argued that action research, unlike traditional forms of qualitative and quantitative research, focuses only on classroom problems that require informed decisions and solutions. Action research is conducted in seven simple steps. It is distinguished from other research forms in terms of scope, sample size, data types, and data analysis techniques. Many teachers and administrators find action research a very practical and user-friendly approach to conducting research since it is less formal than traditional research types.

 Keywords: Action research; Remedial instruction; Curriculum development; classroom

Introduction

More than ever, in many countries including Iran, students' achievement is equated to their performance on high-stakes tests, and teacher and other educators across many countries are held accountable for this success. Teachers and administrators must therefore identify what techniques improve student learning and which ones fail to do so;

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they are expected to develop successful instructional practices on the basis of this knowledge (Airasian, 2001).

The first thought that pops up when you hear the term 'research' is that the researcher should spend months or even years and undertake many difficult steps in a process to create a scholarly piece of work. Research, to many people, means quantitative and qualitative processes that involve questions, hypotheses, design, data collection, data analysis, and findings. More importantly, these processes will not be complete unless they are described in well-written or well-presented reports that are published in scholarly pee-reviewed journals or presented in high-status symposia or conferences (Mason, Lind, and Marchal, 1991). As such many teachers will consider research an extra burden in their regular regimen unless the word research is used in a novel sense. Nevertheless, many teachers are so involved in their routine activities that they are left with almost no time for research whatsoever. Here is where action research comes into play.

Action research is a more practical and user-friendly than research defined in traditional senses. It is conducted research for one main purpose: to improve teaching and learning (Slavin, 2006). Due to its less formal nature, teachers and building administrators will find by far the easiest form of research to conduct. It can involve a single researcher or a collaborative team working together to focus on a mutual topic (Ross-Fisher, 2008). It can even involve all teachers within a specific grade level, a particular department, or an entire school (Ross-Fisher, 2008).

Sample size is not that important in action research. Unlike traditional research types that require a sizable sample of participants/subjects, action research can be conducted with a single student, if necessary. Furthermore, the results of action research are not hard to report. Unlike traditional research types where researchers are, by an established tradition, expected to report their findings in scholarly papers or conferences and the like, reporting in action research, as Ross-Fisher (2008) argued, might consist of much less formal means (e.g. faculty meetings, professional development workshops, or publication on the school district's Web site). Finally, an action research project is not bound with

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certain time limits; it can span from a single week, or it can last several months or even years.

Action research, especially in K-12 education, is conducted in a series of successive steps. They include:

- Identify and define the problem;
- Frame the research question(s);
- Review the related literature;
- Collect the data;
- Analyze the data;
- Answer the research question(s);
- Draw the conclusion(s);
- Draft a plan of action for the future and reflect on the experience; and
- Share and disseminate what has been learned with colleagues.

Step1: Identify the problem

The first step in successful action research projects is the identification of a problem. Teachers are fortunate in this connection because schools are full of problems; teachers do not need to look that far to find a problem to be addressed through action research, especially in K-12 programs (Sagor, 2000). The following adopted from Ross-Fisher (2008) is a list of some areas where teachers can look to find problems:

- Poor attendance;
- Content-area assessments;
- Lack of parental involvement;
- Poor performance specific tests or subtests;
- Bullying or aggressive behavior on the playground;
- An entire grade level that scores below expectations;
- Writing skills that do not meet grade-level expectations; or

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- Reading comprehension skills that prevent students from passing.

Once a topic is selected for action research, it should be narrowed down. This involves looking for patterns in a recurring problem (Ross-Fisher, 2008). A problem observed only once or twice does not look significant enough to be addressed through action research although it can be a concern. Problems that linger on, however, are good candidates for the focus of an action research study.

Once selected for action research, the problem should be articulated in a clear and concise manner. Ross-Fisher (2008) argues that the problem should be stated in such a way as to enable the teacher to answer the following questions:

1. How do I know this is a problem?
2. On what am I basing my belief?
3. What evidence do I have that this is truly a problem worth investigating?

Step 2: Frame the research question(s)

The second step in action research is the formation of specific researchable questions. For most action research studies, three to five questions can be framed although this is not a strict immutable number; it is possible to conduct an action research that addresses only one question. It is of vital importance that questions in action research be worded appropriately. The wording of each question should be such that that question will be as narrow, as specific, and as researchable as possible (Ross-Fisher, 2008). The research questions should not be vague; this will make the research design and the process of data collection quite complicated. In framing questions for action research, the researcher should take at least three elements into consideration: (a) the student population, (b) the desired result, and (c) the specific strategy for achieving the end result.

Some examples of appropriate action research questions have been provided by Ross-Fisher (2008). Ross-Fisher (2008, p. 161) provided examples of poorly-worded questions that lack the three elements stated above (i.e., the student population, the desired result, and the specific strategy for achieving the end result). Here is one example:

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- Is it possible for students to incorporate the use of word walls in all areas of their education?

The language in this question is ambiguous and confusing. The three required elements are not apparent in this question. Therefore, achieving a successful action research project based on this question, if not impossible, would be quite difficult. The question can be modified as the following:

- Does the use of interactive word walls improve the quality of fourth-grade students' writing samples?

This modified question clearly identifies on whom the project will focus (i.e., fourth-grade students), the specific intervention (i.e., the use of interactive word walls), and the ultimate goal (i.e., improvement in the quality of students' writing samples).

A very important consideration in constructing research questions is how they can be answered. Not all constructed questions are research questions. For example, a question that can be answered by consulting a textbook or by reading a journal article is not appropriate for action research (Ross-Fisher, 2008). As such, action researchers should always keep in mind the specific ways in which questions can be answered. If an actual strategy, technique, or intervention/treatment is not required for answering a questions, that question is not a research question. Therefore, action research questions should be answerable through the implementation for a specified length of time of an actual strategy, technique, or intervention that is intended to elicit change.

This means that the construction of action research questions is perhaps the most crucial element of planning relative to a successful research design. In other words, before generating the wording of action research questions, the researcher should clearly identify specific elements of the desired result, how the desired result will be attained, the specific student population addressed in the research, and how the questions could be answered. Only after drafting this information should the process for writing questions begin. Seen

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in this light, writing action research questions will be relatively simple. Table 1 provides a useful format for planning action research questions.

Table 1   *A Useful Format for Planning Action Research Questions*

	Examples		
	1	**2**	**3**
Desired End Results	Improved performance on science and social studies unit tests	Improved motivation	Improved quality of writing skills
Method for Achieving the Desired End Results	KWL	SMART Board™ technology as an instructional medium	Peer writing and review
Specific Student Population	Sixth-grade students	Fourth-grade struggling readers	Ninth-grade English class
How the Question Could Be Answered	Administer a pre-test in science and in social studies to get baseline data. Work with students using KWL for eight weeks. Administer a post-test in science and social studies to determine growth and progress. The instrument should be the same (testing the same skills), but should not be the identical version.	Administer a student motivation survey or reading interest inventory to gather baseline data. Work with students using the SMART Board as an instructional medium for four weeks. Administer the student motivation survey or reading interest inventory to determine change in motivation levels.	Take a writing sample and evaluate using an approved writing rubric. Work with students using the peer writing and review process for one quarter. Take another writing sample and evaluate using the same writing rubric as was used to gather the baseline data.
Possible Question	Will KWL improve my sixth-grade students' performance on science and social studies unit tests?	Does the daily use of a SMART Board serve to improve the motivation of fourth-grade struggling readers?	Can peer writing and review improve the quality of writing skills demonstrated by my ninth-grade English class?

Adopted from Ross-Fisher (2008, p. 162)—with modifications

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Step 3: Review of related literature

As Pyrczak (1999) rightly noted, the review of the related literature should follow as the next step. The researcher should provide a review of the investigative work focused on the topic of his/her research that has been conducted by respected people within the profession (Ross-Fisher, 2008). One very important point to keep in mind while reviewing the literature is that redundancy should be avoided; in other words, "If the research questions already have been answered, studying them again may be redundant" (Ross-Fisher, 2008, p. 162).

A very important advantage of the literature review is that, many times, it will provide insight regarding the other topics that can be explored. The literature review should have a general-to-specific organization; in other words, the researcher can begin with a broad scope and then gradually make it more and more specific. Anyway, by the end of the literature review, as Ross-Fisher (2008) argued, the researcher should have clarified what other authoritative sources have written on the topic. Moreover, the researcher should have also provided support for the specific research design that he has chosen for his own work; that is, the design of the research should be backed up by literature review in such a way as to clearly ascertain that the project shows promise for success.

Step 4: Collect the data

The fourth step in action research is to collect data. Data collection requires a specific research methodology. In fact, many researchers prefer to use the term "methodology" for this section of their works. It refers to the specific methods that is required to answer the research questions.

Methodology is very important in that it must align with the research questions (Salvia and Ysseldyke, 2001). Methodology is that part of action research that will answer these questions:

1. What data should and will be collected?
2. How will the data be collected?

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3. How will the data be analyzed?

Perhaps methodology is also that part of action research that distinguishes it from traditional qualitative and quantitative research forms. In traditional quantitative research, methodology would talk about a large sample size, standardized tests, and inferential statistics like ANOVA, Regression, etc. (Patten, 2000, 2001). Traditional qualitative research forms, on the other hand, required smaller sample sizes as well as data collection by means of interviews, questionnaires, observations, portfolios, and the like; data would then be analyzed by means of such descriptive statistics as population mean, median, and mode (Pyrczak, 1999).

By way of contrast, action research often involves one or a combination of the following sources of data:

1. teacher observation
2. examination of student work samples
3. interest inventories
4. performance on teacher-created assessments
5. performance on commercially produced instruments

In addition, data analysis in action research requires certain techniques such as specific types of coding or criterion-referenced scoring guides or rubrics. An example of such techniques is "Rubrics for Success" (Ross-Fisher, 2005).

Finally, the action researcher should establish a timeframe for carrying out each step of the research. This will definitely lead the researcher to remain organized and focused.

Step 5: Analysis of the Data

Another step that distinguishes action research from traditional research forms is data analysis. It has already been indicated that the use of criterion-referenced rubrics or other types of rating scales usually works well with action research (Strauss and Corbin, 1990). However, these are not the only data analysis techniques for action research. Other typical techniques in action research, for instance, include teacher-made tests,

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observation checklists, and other comparable approaches (Ross-Fisher, 2008). If the sample is large enough, it is possible to use some form of inferential analysis but formal methods, like those employed in quantitative designs, are not typical of action research (Ross-Fisher, 2008).

The action researchers is advised to search for trends—patterns of evidence—over the duration of the study. This is very important since the underlying premise of action research is to improve teaching and learning. This goal can be accomplished only if the teacher/researcher determines "whether and to what extent the intended result is occurring within the context of the specific strategies or techniques employed in the investigation" (Ross-Fisher, 2008, p. 163).

One good technique is to compare pre-assessment data with post-assessment data to determine the impact of a classroom technique. This will not only show if there has been any growth but will also show the size of the growth where one exists. It is also good to present the data in charts, graphs, or tables. The analysis of the data will not only have to answer the research questions that were posed in step 2, but should also lead to the conclusions of the study. If the selected data analysis procedure fails to do this, another data review is necessary. Where information is not available to answer the questions, this may indicate that there was a flaw in the study design and that different data collection methods are necessary (Pyrczak and Bruce, 2003).

Step 6: Draft a plan of action

The next step is to draft a plan of action for the future; at this time, the researcher should reflect on the experience (Sagor, 2000). This process may modify the instructional strategy that is connected wit a particular study unit, may result in a change in curriculum for a specific skill, or may even vary the sequence of materials that are presented in the classroom. The researcher, as part of the plan of action, may make recommendations for future research by others. The researcher can also reflect on the results of his research:

1. to identify and explain the specific strengths and weakness of the study;

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2. to decide what s/he would do differently next time if given the chance to repeat the investigation?

A full engagement in this type of reflective practice requires that the teacher/researcher maintain a daily log or journal. Such a journal will include not only what actually takes place, but also anecdotal information and additional questions or concerns (Ross-Fisher, 2008).

Step 7: Dissemination of the findings

The last step in action research is to disseminate what has been learned with colleagues. After all, action research has a very important duty: to improve teaching and learning, and not just for one classroom exclusively. It is a sad thing to do action research and not to share the findings with others who can benefit from them.

Unlike traditional research forms that are often disseminated in scholarly papers, action research findings can be presented to the public in an endless number of ways. A few of the commonly practiced ways are:

- Peer discussions in faculty meetings after school
- Presentations at professional development workshops
- Publishing articles on the school's Web site
- Presentations at local/state/regional conferences
- Narrated PowerPoint® presentations sent throughout the district via e-mail

Dissemination of the findings will allow colleagues to apply findings from the research; it may also motivate colleagues to join in future collaborative action-research projects which will, in turn, continue the cycle of improving teaching and learning.

Conclusion

In this paper, it was argued that action research, unlike traditional forms of qualitative and quantitative research, focuses only on classroom problems that require informed decisions and solutions. Action research, as explained in this paper, is conducted in seven

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simple steps. It is distinguished from other research forms in terms of scope, sample size, data types, data analysis techniques, and so on.

Action research, like any other research design, does have its own limitations. For example, where a strategy is used with a couple of students, it is not possible to assume the effect of that strategy for the entire class. Moreover, study duration will also cause some restrictions. If a study is conducted in a short two to three week period, the results cannot be as conclusive as the results of study that has taken several months to complete. Another important point is that intervening strategies (i.e., those that modulate the effects of the strategy under study) should be controlled throughout the study so that the impact of the main research strategy (i.e., the treatment) can be determined with confidence.

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