Education 6610
Research on Computers in the Curriculum

A Synopsis of Idea-Based Research
(Final Synopsis)

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Introduction:

What exactly is idea-based research? Research, itself, is the systematic investigation of questions or problems, using rigorous, standardized techniques to arrive at conclusions, or better understandings of aspects of the world in which we live. Research, however, often takes a variety of forms, and research problems stem from myriad sources. This is true of research in education, as it is of research in any field. Sometimes research in education is driven by data collected within the education system. Other times, research is spawned from ideas, or theories, that grow out of day-to-day experience and observations within the education system. This type of research has a different source, and can serve a variety of purposes that differ from data-driven research. It is often used to answer questions for different end-users. And it can utilize any number of standard techniques and practices, and call upon any number of special considerations, depending on the context of the research. The question is, however, what exactly is idea-based research, and how does it differ from other types of research? What constitutes good idea-based research? How, exactly, is idea-based research useful, and who would use it? How is idea-based research carried out? And what considerations must be taken when conducting idea-based research?

What is Meant by Idea-Based Research?:

Quite simply, idea-based research is research that stems from ideas, or theories. It is true that there are theories, or hypothesis, involved in all research (Leedy and Ormrod, 2001, pg. 60). A researcher must have some idea of what effect they are looking for, or, rather, what type of effect, or where that effect may lie, if the collection and interpretation of data are to be focused. Data-driven research must have theories, or hypotheses. The difference is, however, that in data-driven research the causes-and-effects are already present, and have already been observed. The data are there, and theories or hypothesis are developed to help interpret that data, and to test these relationships. Idea-based research stems from observations and opportunities in the day-to-day educational environment. Ideas for research can arise from any number of situations, or learning opportunities. An educator, or potential researcher, may find him or herself asking "what would happen if I tried this?," "would there be any benefit to students if I did such and such?," or "I've noticed this happening with my students…is there really a trend / effect?" (Leedy and Ormrod, 2001, pp. 47-58). In addition, an educator or potential researcher may gain ideas or insights from research that has already been conducted (Leedy and Ormrod, 2001, pp. 47-58, 70-75). Most researchers, when publishing their findings, pose questions or problems for further investigation. The findings of other researchers, or the further questions or problems that they pose, can generate new ideas for valuable research in the field of education. From these observations and ideas stem the researcher's theories, or hypotheses, which are used to define the problem to be researched, and the design and focus of the research itself.

What Constitutes Good Idea-Based Research?:

First of all, for an idea-based research study to be a good one it must meet the general requirements for legitimate research. These requirements are not always obvious to anyone just entering the field of research; anyone with years of intermediate, secondary, and undergraduate post-secondary education, who have heard the term 'research' used as a catch-all phrase

encompassing any form of information gathering (Leedy and Ormrod, 2001, pp 3-9). Research does not involve looking up useful information, or transposing it from one location to another. Research must focus on a problem, for which a theory or hypothesis is usually posited, and for which a systematic approach is designed to achieve the goal of resolving the problem. If the idea behind an idea-based research study meets such requirements, then it is on its way to being good idea-based research. But there are other requirements.

One thing which potential researchers must consider is the originality of their idea. A close look at the related literature must be taken to discern whether or not the idea has already been explored, an act which can create new idea-based research possibilities in and of itself (Leedy and Ormrod, 2001, pp. 70-75). If such an idea has already been researched, would there be any value to repeating the study? Did previous researchers posit further questions or problems related to the idea, which could now be explored?

Another consideration for potential researchers is that of the appropriateness of the idea (Mann, 2001). There are some ideas that would simply be inappropriate as the foundation of a research project. There is no point to undertaking a study for which the outcome is plain and obvious at the onset. What benefit would there be to exerting such effort if the answer to the question is already known, or for that matter, if it is common knowledge? The user-friendliness of educational resources, such as computer programs, would also constitute inappropriate research ideas. That topic is more a matter of product development, than a problem of concern to educational researchers. And studying the effectiveness of computerized curriculum instruction, as opposed to classroom instruction, would be an inappropriate research idea. It is generally accepted that well-trained human instructors can do a much better job of meeting students' needs than even the most well-programmed software. Generally speaking, what makes for appropriate or inappropriate ideas for idea-based research is a matter of a little common sense on the part of potential researchers. Researchers must ask themselves whether the idea is genuinely useful, and whether there is any real sense in expending the tremendous amount of effort involved in undertaking such a study.

How is Idea-Based Research Useful, and Who Would Use it?:

Idea-based research can have many benefits in the context of education (Crocker, *The Nature of Educational Research*, 1999). While policy issues such as funding priorities often rely heavily upon the results of data-driven research, idea-based research is no less vital to the education system. It can be used to develop and test new learning activities and tools than can not only make education more interesting for all parties, they may also prove more effective for the end-user, the student. It can be used to help improve the efficiency of existing teaching and learning tools and strategies. Idea-based research can be used to generate, develop, and test new curriculum, which is an area that has placed great demands on resources in many regions over the past decade. Or it can simply be used to satisfy the general interests of educators and researchers, helping to further our overall understanding of the teaching and learning process by systematically observing and interpreting phenomena that are casually, and often absent-mindedly observed in schools on a daily basis. In essence, idea-based research is research that draws upon what educators see happening around them, the ideas for learning opportunities that educators may have, and the theories that are developed as a result of daily observations. It adds to these things a systematic approach to examining, and validating or rejecting these ideas and

observations. And it provides an opportunity for these ideas and observations to be put to good use.

How is Idea-Based Research Carried Out?:

Idea-based research is carried out much like any other form of research (Leedy and Ormrod, 2001, pp. 90-106). It starts with observations or ideas, which are refined into theories or hypotheses. These theories or hypotheses are used to define the problem to be investigated, and to add further focus to this problem by dividing it up into any necessary sub-problems (Leedy and Ormrod, 2001, pp. 56-63, 90-106). From there, an actual plan of attack for the research can be developed. The researcher can decide on exactly what must be tested in the study; what data must be collected, and how this should be done. Effective research tools may already exist to aid the researcher with the study, saving a great deal of time and effort, or the researcher may need to develop new tests and tools. The researcher then sets about recruiting participants for the study, carries out the study and collects the desired data. The data is then systematically analyzed and interpreted, followed by any necessary follow-up with the participants, and, hopefully, publication of the study's results.

What Considerations Must be Taken?:

When conducting idea-based research, a number of considerations must be taken. The first of these is the type of research (Bieger and Gerlach, 1996, 35-38; Leedy and Ormrod, 2001, pp. 90-106, 148, 191-196). Will the study be of a quantitative or qualitative nature? The answer to that question depends on the idea being explored. The researcher may be looking for signs of improved academic achievement in light of a research treatment, in which case a quantitative approach may be more appropriate. Or a researcher may be looking for the effects of a research treatment on students' general attitudes towards subject matter, and the learning process. A qualitative approach may be more appropriate under such circumstances, since it can be difficult to quantify personal attitudes and preferences.

The second major consideration for a researcher is the extent of the study. A research study should be feasible in terms of cost, and time considerations (Crocker, *Introduction to Quantitative Research*, 1998). A study that is too large would be too costly, and could take far too long to conduct. In addition, educational research is best conducted in an actual educational context, meaning in actual classrooms. Studies that are too time-consuming, and that are too large in terms of the number of students, classes, and schools to be involved, create a new problem for the researcher – gaining the cooperation of the school board or district. As well, studies that are too large often sacrifice internal validity by introducing the possibility of greater numbers of intervening variables (Crocker, *Introduction to Quantitative Research*, 1998). Educational research must take into consideration the four aspects summarized by the abbreviation *D.E.C.L.* – the *D*elivery, the *E*nvironment, the *C*ontent and the *L*earner (Mann, 2001). While carefully crafted research studies can control the content, larger studies would include more teachers. More teachers mean more variation in the delivery of education. Larger studies often mean more schools, and that means a broader geographic and demographic area, introducing more variation into the learning environment. It also introduces more intervening variables with respect to the learners themselves.

To minimize these problems, and the random aspects of student achievement – to increase internal validity – necessitates a narrowing of the studies educational context, say to a single class, school, or geographic / demographic area. However, this is not without its own problems (Crocker, *Introduction to Quantitative Research*, 1998). A study that is too narrow risks sacrificing external validity for the sake of internal validity. For the findings of research to be applicable within the education system, they must have a certain degree of generalizability. The end-users of the research findings must be confident that the findings are truly representative of the entire population of students, not simply representative of a specific type or group of students. One way to avoid this problem is to keep the study narrow enough in scope to ensure internal validity, but to repeat the study in a variety of settings, increasing its external validity. The repetition of research always increases confidence in the validity of the results (Leedy and Ormrod, 2001, pg. 106).

Finally, when dealing with idea-based research in the context of educational settings, researchers must take certain ethical considerations (Bieger and Gerlach, 1996, pp. 227-232; Leedy and Ormrod, 2001, pp. 107-111). The participants of the study are children, and thus cannot legally consent to participation. Parental consent is necessary if the children are to take part in the study, and if the children are to be videotaped in the course of the study. It is a good idea, however, to gain written consent from the child as well as from the parent, and to ensure that both parents and children are permitted to withdraw from participation at any time. Another ethical consideration is minimizing the risk of harm to the children taking part in the study. The content of the study should not have a bearing on the students' academic records. The delivery of the treatment should be consistent. The anonymity of participants and the confidentiality of their results should be maintained at all times. The results of the research should be provided to the participants once it is available. And any experimental treatment that proves beneficial to participants should be offered to students in the control group as well, once the study has been completed.

Conclusion:

Idea-based research can be extremely beneficial within an educational context. It serves a variety of purposes from the development of new curriculum to the exploration of new teaching and learning tools and strategies. It helps to give validity and credence to the ideas and theories that stem from observations of actual learning situations, and can create and expand beneficial new learning opportunities. Idea-based research is necessary to the advancement of our understanding of the teaching and learning process, as well as the advancement of the education system itself. However, idea-based research, like any form of research, must be conducted with recognition of various considerations. These include the type of research, the methodologies to be used, the feasibility of the study in size and scope, the validity of the study, and the ethical treatment of participants, and of the research subject matter.

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