Formative evaluation: An instrument to measure the effects of using the Universal Format

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FORMATIVE EVALUATION: AN INSTRUMENT TO
MEASURE THE EFFECTS OF USING THE
UNIVERSAL FORMAT

by

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A dissertation submitted in partial fulfillment
Of the requirements for the degree of

Doctor of Education

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Formative evaluation: An instrument to measure the effects of using
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is approved in partial fulfillment of the requirements for the degree of

Doctor of Education

Examination Committee Chair

Dean of the Graduate College
ABSTRACT

Formative Evaluation: An Instrument To Measure The Effects Of Using The Universal Format

By

Dale Brent Warby

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University of Nevada, Las Vegas

An instrument to measure the effects of using the Universal Format for translating research to practice was developed. Measures of teachers' responses concerning the benefits, knowledge of research practices (informed status), and beliefs toward research-based knowledge were formatively evaluated. Five developmental phases were employed to identify, develop, and field-test a
questionnaire and a training module with teachers enrolled in university coursework.

A quasi-experimental design was utilized including an experimental and a control group. Subjects in the experimental group received training in using the Universal Format and translated research articles. Subjects in the control group translated research articles, but received no training module. Expert evaluation, subject feedback, and data were used to determine the merit of the questionnaire and training in validating the use of the Universal Format. Results indicated that the questionnaire was useful in evaluating pre-and post-test performance regarding research-based knowledge under experimental conditions. Experimental subjects significantly improved in positive responses between pre-and post-test toward the benefits, informed status, and beliefs concerning research-based knowledge. They also had a significant improvement in their translation of research articles for classroom applications. Control group subjects significantly improved in positive responses between pre-and post-test concerning benefits, informed status, and beliefs concerning research-based knowledge.
They did not experience significant improvement in the translation of research articles for classroom applications. Implications for continued use of the questionnaire and training module with the Universal Format for further evaluation in a representative field test are discussed.
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CHAPTER 1

INTRODUCTION

The use of research-based knowledge as a foundation for effective teaching is considered to be an important element in education today (Biddle & Anderson, 1984; Brophy & Good, 1986; Carnine, 1997; Doyle, 1987; Evertson, 1987; Fenstermacher, 1983; Rosenshine & Stevens, 1986; Walberg, 1986). Research-based knowledge has been described as "systematic and sustained inquiry, planned and self-critical, subject to public criticism and to empirical tests" (Ruddock & Hopkins, 1985, p. 18). With the increasing diversity of learners, including students with disabilities, higher standards of social and academic performance need to rely heavily on research-based knowledge to provide effective educator interventions (Carnine, 1997).

Recently, there has been considerable national interest and support for including research-based knowledge in teaching practices. National goals for education, as
outlined by America 2000 (Stoufe, et al., 1995), are calling for increased emphasis on research-based knowledge in effective teaching practices (Tushnet, 1992). The Office of Educational Research and Improvement (OERI) recently organized a major initiative to identify research gaps in education and appropriations are being directed to projects that incorporate research in educational practice (Stoufe, et al., 1995). Additionally, OERI is calling for more collaboration between researchers and practitioners to improve practice in the classroom. The American Federation of Teachers has established a goal to increase the number of educators who are capable of using research in applied settings; they are urging that recommended instructional strategies have a clear research base prior to any effort to apply the strategies in practice (Kornblet, 1997). Proponents of school reform have been recommending the need for research in the knowledge base of educators for quite some time (Fleming, 1988). School reformers argue that educational research represents the foundation upon which teacher education should be built. Such a foundation should provide information to educators to improve their teaching practices (Schulman, 1987).
Recent developments in educational research have created a significant and rapidly expanding body of research that can be helpful in assisting educators in the classroom. This vast source of information and technology, to a great extent, is not being directly used by educators (Wilson, 1989), although it is an important national educational priority.

Educators lack the skills and knowledge to translate research presented in journal articles into practical applications for the classroom (Speece, MacDonald, Kilsheimer, & Krist, 1997). This creates a gap between the findings of research and the educator's use of research-based knowledge (Carnine, 1997; Kauffman, 1996; Livingston & Castle, 1989; Lovitt & Higgins, 1996). The questions raised by this gap require study. Investigations are needed of methods that provide the means for educators to access and translate research into practical situations.

Statement of the Problem

Though research-based knowledge has been established as a critical element for improving effectiveness in education, it is a subject of controversy. Educators have found research to be difficult to access, read, understand, and apply in the classroom (Buchmann, 1984; Carnine, 1997;
Researchers believe that the underlying foundation for and continued development of the knowledge base educators use in teaching students can make the difference between students' success and failure (Casanova, 1989; Maeroff, 1988; Jaquez, 1989). Unsubstantiated methods of teaching do not compare with the rigorous validation that comes with research-based classroom practices (Kauffman, 1996).

Problems have been identified between educators and researchers in applying research. Carnine (1997) and Fleming (1988) found problems with credibility to be a primary question from educators regarding educational research. They indicated that determining the difference between effective and ineffective research is a difficult task, even for experienced researchers. Educators find research too unwieldy and complex (Billups & Rauth, 1987; Jaquez, 1989; Sawyer, 1987) and they find they are unfamiliar with the conventions of research (Schiller, Caroll, & Pankake, 1989). Buchmann (1984) indicates that educators lack opportunities to discuss and digest the strengths and weaknesses of a given idea in an open, nonjudgmental atmosphere. Because of this generally restricted nature of staff communications, good ideas developed by small groups of educators as a result of
reviewing research are not necessarily dispersed to the rest of the school (Crandall, Eiseman, & Louis, 1986). Two of the most often cited problems for educators are 1) gaining access to research, and 2) the lack of time to delve into libraries in search of articles (Fleming, 1988). Because research is available primarily in university libraries, it is extremely difficult for a teacher to access this research unless he/she is enrolled in a university course. Additionally, educators must have knowledge of how to access databases that contain references for the materials in question. Researchers are described by educators as having little to do with understanding the day-to-day issues in the classroom (Griffin, 1983). Typically, research is not classroom based and research occurs in laboratory type settings. According to Phillips (1980) researchers have very little to offer educators because of their lack of focus on application. Recent studies such as Wang, Haertel, and Walberg’s (1993) indicate that the decontextualized nature of research ignores the teachers’ context. Educational research is not concerned with application as much as it is with revealing new information (McMillan & Schumacher, 1993). Educators are concerned that research can be a tool used by administrators to limit their independence. They believe
that administrators can assume the power to impose instruction (justified by research) based on their own particular motivations rather than according to the needs of educators or students (Casanova 1989). Finally, educators tend to feel that they hold a lower status than researchers (Casanova, 1989). They believe that researchers sit in ivory towers and expect educators to read and implement their findings relegating teachers to the role of followers.

Purpose of the Study and Rationale

The definitive data on the overall influence of research-based knowledge on educators have remained elusive. Research, thus far, has focused little on developing the skills educators need for translating research into practice. Further, there is a lack of instrumentation present in the literature to assess research-based knowledge. The purpose of this study was to Formatively evaluate the instruments that assess the effects of the Universal Format (Warby, Greene, Higgins, & Lovitt, in press). The Universal Format was developed to assist educators in the translation of research into practice. These instruments were designed to assess benefits, informed status, beliefs, and knowledge regarding
teachers' use of research-based knowledge in the classroom. Instrument development followed systematic planning, construction, and quantitative and qualitative evaluation. It was expected that if results of the formative evaluation were positive, this would facilitate the further refinement of the Universal Format from a design phase to preparation for use with a large-scale representative sample.

Of the literature addressing the use of research-based knowledge the following categories emerge: (a) representations that focuses on improving the attitudes of educators toward research (Castle, 1988; Evertson, 1987; Griffin & Barnes, 1986; Lange, 1994; Red & Shainline, 1987), (b) representations that provide suggestions to enhance the understanding of research-based knowledge through educational reform (Biles, Billups, & Veitch, 1983; Eaker & Huffman, 1984; Fenstermacher, 1987), and (c) representations incorporating procedures for collaborative efforts to implement research-based practices in the classroom (Gersten, Morvant, & Brengelman, 1995; Lovitt & Higgins, 1996). These studies have not addressed specific procedures and techniques for translating research that is relevant to the practical needs of educators (Erion & Steinley 1994; Warby, et al., in press; Zeuli, 1992). None of the current research was found to provide specific
rationale and methodology for individual educators to access and interpret primary research for practice in the classroom. No studies were found that incorporated instruments that measured educators use of research-based knowledge in the classroom. Additionally, no instruments were located that measured the beliefs and attitudes that educators have regarding research-based knowledge.

Erion & Steinley (1994), found that most textbooks on educational research pay little attention to application. The study suggested that “once one has comprehended the research and evaluated it, the implications will be self evident” (p.11). The lack of attention to application in textbooks may be a possible reason primary research has not been considered useful to educators. An educator needing pragmatic information to resolve a current problem with a student does not desire theoretical assumptions, but rather practical steps that lead to active intervention.

Educators need to access and incorporate scientifically validated research-based practices into their classrooms in order to assure that effective teaching behaviors will be demonstrated (Casanova, 1989; Gall, Borg, & Gall, 1996; Jaquez, 1989; Livingston & Castle, 1989; Maeroff, 1988). This type of research addresses specific concerns regarding (a) validity, (b) reliability, (c)
sample, (d) setting, (e) procedures, (f) generalizability, and (e) limitations in the use of the knowledge resulting from the research. If educators were to become proficient in reviewing and translating research literature, many of the misconceptions and opinions about educational practices might be mitigated (Erion & Steinley, 1994; Warby, et al., in press; Zeuli, 1992). For example, there have been many misconceptions regarding the inclusion of children with disabilities in general education classrooms. The literature is replete with opposing opinions on this subject even though there is a growing body of research-based evidence concerning the beneficial effects of inclusionary practices (Stainback & Stainback, 1996). Unfortunately, this research-based evidence is supplanted with the opinion literature as the typical information source for many educators.

By reviewing and translating primary literature, educators can evaluate empirical findings and then identify practical applications. Such applications could then be based on results from data subjected to rigorous scientific inquiry. When educators are properly informed they can then decide for themselves what the best route is for resolving the problem or concern before them in their classrooms. They also will avoid potential errors in application when
others have done the translation or synthesis. These translations are those that typically might be found in textbooks or instruction provided in workshops and in-service training. These secondary sources may not have the understanding, skills, or motives, aligned within the context of an educator’s practical needs.

Research-based information has become an important component of educators' professional knowledge (Zeuli, 1992). Research-based knowledge can serve as a source of information to educators in determining how to effectively teach. Over the past several decades, the growth in the use of research-based knowledge has presented a challenge to educators and researchers. Past research, while providing much information about the potential advantages of using research-based knowledge in the classroom, has provided little empirical evidence regarding methods that can assist educators in using research in their classrooms. The interaction between the beliefs of educators and their use of research-based knowledge needs to be clarified. Educators, in order to fulfill their responsibilities as professionals need to read and incorporate research into practice (Good, 1989). Research needs to be accessed and interpreted in a way that is meaningful, easy to apply, and interesting, if it is to be accepted and used (Jaquez,
1989). If educators are to fulfill their professional obligation to incorporate a solid foundation of research-based knowledge into their repertoire of pedagogical techniques, specific tools for translating research into practice need to be developed and become a part of the teacher education tradition.

If educators were provided with a variety of tools or strategies for translating research, a positive outcome in teaching students in their classrooms is possible. Such a tool, along with strategies, is evaluated in this study.

According to Warby et al. (in press), the Universal Format (see Appendix A) is designed to provide a framework for the educator to synthesize a research article into a short reference for use in the classroom. The Universal Format was intended to provide easy access to interpret research by an educator. The step-by-step process attempts to narrow the focus for the educator as well as offer suggestions for how to find and select a research-based article. Educators are guided through the following procedures that then use the 7 steps identified in Appendix A:

1. **Identify the problem or concern to be addressed.** It is important to begin with an idea or problem in mind. Before beginning a search effort, it is recommended that
educators assess their need for information and then prioritize topics.

2. **Seek a variety of sources.** Research-based information is often located in a number of places. Typical sources include public and university libraries. Databases are typically available through a computer at the library, as well as from home or school computers. The databases can be queried for specific references, making it simple to identify and locate material.

3. **Read, review, and evaluate information found.** Prior to accessing journals and materials, it is recommended that the educator conduct an adequate review of the literature by searching the electronic databases in the library such as Educational Resources Information Center (ERIC). This will provide assurance that a wide variety of materials and literature have been covered, and that important sources have been identified.

4. **Select primary sources.** Primary sources are those materials that have been generated by the original author. Most often, these articles contain quantitative or qualitative analysis of the internal and external validity of the articles being examined. In this manner, the educator has the opportunity to view the research through
his/her own lens rather than having to rely on interpretation by secondary sources.

5. **Distinguish between theory and opinion.** It is important to distinguish between material that is empirically based and information that is opinion-based. It is suggested that a simple way to determine the difference is to look at the structure of the article. If the subtitle "methodology" appears within the body of the article, it is a sign that the article is a research article. Methodology includes procedures that were used in research. Typically, the design involves participants and how variables that are measured or manipulated in order to assess change. Opinion-based research, by comparison, provides information that has been synthesized and transformed by the writer.

6. **Review the parts of a research article.** The Universal Format is used to identify, obtain, and evaluate research. This step is probably the most important. It is at this point that the educator decides: (a) Does the research adequately address his or her problem or concern, (b) What is the level of "fit" between this research and the students to be educated, and (c) Is this an intervention or strategy that complements the philosophy of the educator's classroom?
These are extremely important questions because time is an important element for all educators. These steps offer a procedure that facilitates the review of the article so that valuable time is not spent reviewing a research article that cannot be used.

7. **Translate the research into practice.** This step directs the reader to translate the research into a step-by-step classroom procedure. The intervention is broken down into its sequential components so that it may be applied in the educational setting exactly as the researcher applied it in the research setting.

8. **Identify the reference.** This step requires the participant to name (a) author(s), (b) date published, (c) title of the article, (d) journal, (e) volume number of the journal, and (e) page numbers.

**Objectives of the Study**

The objective of this research study was to validate instruments designed to formatively evaluate the use of the Universal Format and its components by teachers. This was done in 5 phases each with its own set of questions to be answered.

**Phase 1**
This phase of the study involved a determination of the purpose for the instrument development and establishment of target groups. A review of literature was conducted regarding teachers' use of research in the classroom. A series of questions were initially submitted to a group of graduate student teachers for comment. Their comments were interpreted and used to select items for the questionnaire format.

The questions to be answered during this phase were:

**Question 1.** How should the effects of using the Universal Format be measured?

**Question 2.** Are there instruments available that can measure teachers' knowledge, attitudes, and beliefs regarding the use of research-based knowledge in the classroom?

**Question 3.** If the answer to question 2 above is no, then what items could be included in a questionnaire to determine the effects of using the Universal Format?

**Question 4.** Based on items to be included in a questionnaire, what would be the feedback of potential consumers of the Universal Format regarding the format and content of the questionnaire?
Phase 2

This phase instituted the development of a blueprint of specifications for the questionnaire. The items were pooled for each section of the questionnaire. The blueprint contained four main sections (see Appendix B). The first section provided demographic information (e.g., teaching experience, type of setting, educational background, gender). Section two addressed the issues of use or lack of use of research-based knowledge in the classroom by teachers. The third section addressed the degree of understanding subjects had regarding the components of research-based knowledge. Section four focused on the attitudes and beliefs that the subjects had about using research-based knowledge in the classroom. A decision was made at this juncture to drop the section on inclusion, as it was beyond the scope of the study.

The questionnaire was then evaluated by a group of doctoral students and practicing teachers, and revisions were performed. The questions to be answered by this phase were:

**Question 1.** With the comments by potential consumers from Phase 1 incorporated, what would a blueprint of the questionnaire look like?
Question 2. How would the items be transformed into subscales?

Question 3. What would be the evaluation of a small group of educators regarding the questionnaire format and content at this stage of development?

Question 4. What would the newly revised instrument look like incorporating the small group of educators' comments?

Phase 3

During this phase, preparation and implementation of a first pilot test using a quasi-experimental design was conducted. A quasi-experimental design was employed with three different groups of university graduate students in special education coursework. The first group incorporated a training module using the Universal Format (see Appendix A). Details of this procedure can be found below. The second group received an intervention that incorporated the article (Warby, et al., in press) as a format for article translations. The third group received no intervention and therefore served as the control group. Pre- and posttesting were completed for each group. In all three groups, subjects were required to interpret three research-based articles. Error logs (see Appendix L) and annotated materials were collected from subjects in group 1 (group
that used the training module) to identify changes that would enhance the training module for future use. The questions to be answered in this phase were:

**Questions 1.** Would there be changes in scores from pre- to post-test on measures of benefits of research-based knowledge, informed status, and beliefs?

**Question 2.** What would be the changes in the quality of the three successive research article translations performed by each group after the quasi-experimental phase?

**Phase 4**

Phase 4 of this validation study subjected the instruments to a group of expert reviewers who performed content validation and qualitative evaluation. The question to be answered during this phase was:

**Question 1.** What instrument revisions would be made based on expert reviewers’ qualitative evaluation?

**Phase 5**

During Phase 5, the questionnaire was revised in preparation for a second pilot administration that will be conducted outside the scope of this study. The final changes that were made were based on results from the data collected in Phase 3 and 4. The following questions were addressed during this phase:
**Question 1.** Based on results from the data collected in Phase 3 and 4, what refinements can be made to the questionnaire to yield the most information, and to make it more user friendly?

**Question 2.** What would be the recommendations for future field studies using this final version of the questionnaire?
CHAPTER 2

REVIEW OF THE LITERATURE

Reading educational research is an important method for educators to learn about effective teaching. This literature review highlights information found in studies that address the influence of: (a) research-based knowledge on educators, (b) research on educator attitudes toward research-based knowledge, (c) research concerning the translation of research into practice, and (d) criticisms of past research on the effects of research-based knowledge on educators. The identification of relevant literature concerning research-based knowledge was pursued in the following manner. First, computer searches of ERIC were conducted to identify relevant references. Journal articles were identified from the ERIC databases that contained research relevant to research-based knowledge in educational research. These sources were reviewed from 1970 to the present in order to establish the evolution of research-based knowledge. Second, indexes in education
books, books from related fields, and curriculum materials were searched. Third, the OERI in Washington, DC was contacted by telephone for information. Finally, the Internet was searched for other potential databases, including searches through Yahoo and Alta Vista.

Introduction

The purpose of education in the late 18th century was to transmit values, knowledge, and skills primarily for political, social, and religious purposes (Noll, 1983). Effective teaching practices were left to the professional experts who had studied the limited research on teaching. Teacher education consisted primarily of "experienced teachers showing new teachers how they taught" (Landsheere, 1987, p. 77).

During the early 19th century, the influences of people such as John Dewey introduced a shift in educational philosophy. The prevailing approach was focused on teaching practices that were steeped in "abstractedness and isolation" (Noll, 1983, p. 15). Much of what was taught was ingrained in customs and routines established by institutions of the past. Dewey sought to introduce a progressive inquiry-based approach that would bring the learner into an active role in relation to the subject.
matter. Greater attention was given to the critical examination of the underlying principles emphasizing educational methodology. Education, according to Dewey, needed to be based on an investigation of empirical and experimental evidence in order to conceive the best possible practices for learning (Noll, 1983).

The earliest research studies in education were concerned primarily with how the personal characteristics of teachers affected learning (Rosenshine, 1979). The researchers in these studies inquired as to whether characteristics such as sense of humor or intellectual flexibility resulted in increased student learning. For example, do students taught by a teacher with a negative attitude learn less than those taught by a teacher with a good sense of humor? The results of these studies indicated that positive characteristics improved student performance. This research contributed to our current understanding of how teacher characteristics influence learning in the classroom (Shulman, 1987). Unfortunately, many of the results from these studies were not utilized by educators to improve their classroom effectiveness (Gage, 1978).

During the 1950s and 1960s, a concern about accountability based practices in education began to evolve and resulted in the demand for stronger research-based
practices in education. With the arrival of computers, and increased funds for educational research, the practice of teaching became a primary focus and research studies began to appear more frequently in the literature (Medley, 1972). In the early 1950s, researchers interested in effective teaching began to investigate the behaviors of teachers (e.g., teacher characteristics, training variables, and interactive teacher behaviors) (Gage, 1963). During the 1960s, in an effort to improve teaching, researchers focused on various teaching methods and concentrated on the superiority of one over another in an effort to improve education. For example, many researchers were interested in the effects on student performance using programmed instruction, television, films, and computer-assisted instruction (Wallen & Travers, 1963). Unfortunately, this early research failed to precisely define various types of positive teacher interactions, and could not relate these interactions to curriculum and student achievement (Doyle, 1987).

In the early 1970s, researchers again focused on the role of teacher behaviors in promoting student learning. Gage and Giaconia (1981) reported a positive relationship between teacher behaviors and student performance (e.g., specific praise given by the teacher for the desired
behavior of students); however, the research failed to identify related factors such as classroom environments and student backgrounds. This research was important because it focused on behaviors exhibited by teachers that were linked to student achievement and began to address the issue of how teachers can modify their behavior to maximize student learning.

Research such as that of Gage and Giaconia (1981) had important implications. It provided suggestions for how teachers could go about improving student performance and how teachers could modify their own behavior based on systematic evidence. Their research also supported the premise that teacher skills can be developed. Thus their work suggested that teacher training is viable and that there is more to being a good teacher than having certain pre-existing innate attributes. Knowledge and beliefs of teachers as effective indicators took on a much more significant. In addition, research that focused on student behaviors in the classroom as having an effect on learning increased (Doyle, 1987).

These new ways of thinking about how research on teaching could be considered useful for educators in an applied setting added a new dimension to educational research beyond research for the sake of discovery (Doyle,
1987). For example, Bloom (1976) found that pupil time that is tightly structured existed in effective classrooms. Classroom structure was found to have a positive impact on learning outcomes (Rosenshine & Furst, 1973). Studies such as these supported the notion that educators can increase their teaching effectiveness using research-based knowledge.

Research-based knowledge in the 1980s has been described as a period of realization related to the lack of impact that research findings were having on schools and classrooms (Kliebard, 1993). A re-examination of the relationship between research and practice began to appear in the literature, especially in relation to the role the classroom teacher plays in using research to inform practice (Schulman, 1987). Effective teaching practice has been identified as a complex interaction of personal experience, content knowledge, pedagogical knowledge, and knowledge of how to translate the content into practice (Kauchak & Eggen, 1998). According to Kauchak and Eggen (1998), educators that combine knowledge with personal experience provide the most effective teaching practices. The combinations of this experience and knowledge become the first step in the process of effectively utilizing research for practical application. Awareness is needed for
the creation of positive attitudes toward research. Knowledge is needed to provide the foundation of educational practice (Gall, et al., 1996).

An increasing number of educators are becoming cognizant of the contribution research-based knowledge is making toward effective teaching practices (Biddle & Anderson, 1984; Brophy & Good, 1986; Carnine, 1997; Doyle, 1987; Evertson, 1987; Fenstermacher, 1983; Kauffman, 1996; Livingston & Castle, 1989; Lovitt & Higgins, 1996; Rosenshine & Stevens, 1986; Walberg, 1986). Educators who become more aware of research-based knowledge and its benefits increase their repertoire of available tools and resources for meeting the diverse needs of students in the classroom and, thus, increase their teaching effectiveness (Kauchak & Eggen, 1998).

Research-Based Knowledge and Its Influence on Educators

The increasing availability of research literature on teaching can provide educators and researchers with the opportunity to explore effective teaching practices. The extent to which research-based knowledge influences educational practice has been identified as a critical factor in the effort to improve the quality of education.
Carnine (1997), in his review of research on the knowledge base of educators, found a serious gap between educators and researchers. Educators had three primary concerns about using research to guide their teaching practices. These concerns were: (a) research trustworthiness (methodological and analytic considerations), (b) research usability (likelihood the research will be used by consumers), and (c) research accessibility (the ease and quickness in finding and extracting usable information). Carnine found serious shortcomings that compromise the quality of research such as a tendency toward fads, jargon, and a lack of experimental evaluation in the research. Many of the findings indicated that the research failed to address the needs of the practitioners who were expected to put the results into practice. Additionally, much of what can be found in primary research has not been accessible to practitioners because of time involved in trying to locate and interpret research. Carnine made the following recommendations: (a) findings should be derived from replicated, well-designed and well-executed studies; (b) research questions should be clearly aligned with the objectives and needs of practitioners using samples that are close to those in real settings; and (c) information should be made readily available to practitioners. To
accomplish these recommendations, Carnine suggested that teachers receive incentives for accessing research and that educators identify goals and standards for increasing research-based knowledge with their schools. Moreover, Carnine predicted that improving teacher performance would result in to meet higher social and academic performance among learners.

Casanova (1989) discussed differences between educators and researchers on the issue of translating research into practice. It was her opinion that the following problems contributed to the gap between researchers and educators: (a) the tendency for teachers to be wary of researchers, (b) the difficulty teachers experienced in the interpreting of primary research into a practical application, (c) teachers’ perception that they hold a lower rank than researchers, and (d) an unwillingness of researchers to address solutions for immediate problems. Casanova suggested that the problems of researchers included: (a) a lack of well defined variables in actual classroom settings, (b) a preference for more of a laboratory setting, and (c) a lack of patience for teachers needing answers to realistic problems. Casanova suggested that teachers approach researchers with real problems and then collaborate to
develop strategies for interpreting the research into practice. This process would provide teachers with a new status, while simultaneously giving them an opportunity to judge the applicability of research.

Teachers and researchers should develop collegial relationships and collaborate for potential solutions. Casanova further suggested that to truly integrate research into practice, alliances between teachers, researchers, and administrators should be formed.

Building on a foundation for teaching reform, Schulman (1987), emphasized that the key to distinguishing research-based knowledge in teaching "lies at the intersection of content and pedagogy" (p. 15). This intersection is when a teacher interprets and adapts the research into practice, within the context of the classroom and the students being served. Shulman suggested that proper understanding of a knowledge base for teaching increased the potential for more highly effective teachers. Seven categories are outlined in describing an adequate knowledge base for teachers: (a) content, (b) general pedagogy, (c) curriculum, (d) content and pedagogy unique to the teacher, (e) learner characteristics, (f) educational contexts, and (g) educational history and trends. Although teaching is one of the oldest professions, the systematic application
of scientific principles to teachers is only a recent event, leaving much to be explored. Shulman recommends that a significant portion of the research agenda for the next century be devoted to establishing a database of practical knowledge for teachers that he calls “wisdom-of-practice.”

Local knowledge has been defined as the knowledge that is a result of direct experience (Goldenberg & Gallimore, 1991). In analyzing specific teaching practices that are likely to increase a student’s acquisition of the research-based knowledge, Fenstermacher (1987), believes that educators should be given the responsibility for determining the appropriate use of research within the context of their individual situation or classroom. This is in contrast to the usual top down approach whereby teachers are the recipients of specific research, or research interpreted by the organization, as opposed to the individual teacher. According to Fenstermacher (1987), the main point of research-based knowledge was to increase the awareness of accessibility of new information in ways that will assist teachers in taking possession of that information and applying it to the context of their own environments. Fenstermacher goes on to say that sound scientific reasoning requires both a procedure of reasoning about what is being done and a satisfactory base of
information, beliefs, and experiences from which to reason from.

Palincsar & McPhail (1993) addressed the issue of defining effective research-based knowledge for education. They indicated that an effective knowledge base could be accomplished through the context of how school personnel would use the research findings. They concluded that researchers needed to investigate topics that were relevant to the needs of practitioners, be more cognizant of the perspectives of the participants, and be willing to work with the many forms of inquiry that can contribute to a knowledge base. It was their opinion that an effective knowledge base for teachers has to be localized within the context of the school. No evidence of empirical research was provided to document their opinion.

The subject of the interplay between educational research and local knowledge (the result of direct experience) is reviewed in a case study of Spanish reading improvement (Goldenberg & Gallimore, 1991). This study analyzed the interplay between research and practice on reading achievement of Spanish speaking primary-grade children. After using research-based practices to teach Spanish to these children, student progress was minimal. The research selected as examples for use in this study
ignored the variables about individual needs of students and settings. The author’s believed this was typical of empirical research found in the literature and is done to make the research results more generalizable. Educators in the study were frustrated with the lack of consideration for the context and therefore believed that the results identified in the research were not obtained in practice. They concluded that research-based knowledge that fails to take into account the context of the local school culture was insufficient for effecting improved performance in these children. Goldenberg and Gallimore (1991) concluded that researchers tend to select topics important to them and frequently don’t recognize the needs of practitioners. They also found that researchers need to be informed about local school cultures and that the context should be taken into consideration when conducting research. A final point offered was that researchers were able to identify main effects, but the application in a practical setting relies on the interpretation of the teacher beliefs and the local school culture.

Fleming (1988) in a review of the literature identified several problems with teacher use of research-based knowledge. He found that teachers have a perception that research has limited benefits for improving practice
and that teachers have pessimistic perceptions of researchers. The teachers in his review believe there was an over-dependency on research, it took too much time to locate and comprehend information, and there was too much information to assimilate. Many teachers indicated that they lacked the ability to read and understand the research. Fleming also found there was a lack of organizational emphasis on research-based practices in schools. Another perception was that the lag time between the research and publication made it difficult to obtain current information. Lack of reflective activity by teachers, lack of accessibility to research, and research reports that are too cumbersome and technical made research-based knowledge a problem for teachers to incorporate into their teaching repertoire. Teachers believed that research results usually do not offer practical application in the format presented, and many times results in faulty implementation of research in classrooms. In offering suggestions for improvement, Fleming called for a number of conditions that would help in mitigating these problems. Specifically he suggested that researchers identify: the characteristics of research most likely to be used by teachers, the source of information dissemination, the role administrators play in
the dissemination of research, and incentives to reward teachers who access and use research. ..

The National Education Association (NEA) developed a project called Mastery In Learning (MIL) to assist teachers in becoming educational reformers based on being well informed by research and practice (Castle, 1988). As a part of this project, teachers were required to analyze their attitudes, instructional styles, and other conditions that influence learning within the context of a validated knowledge base. Because research-based knowledge was a prime initiative, four phases facilitated this process in the project: (a) a detailed description of the school was developed, (b) faculty were interviewed and polled for development needs, (c) faculty in the project utilized a data base called "TRaK" (Teaching Resources and Knowledge) to find the resources they needed, and to network the various sites together by computer link, (d) the data on research-based knowledge was aligned with the teachers beliefs and attitudes. An interactive research base was created through the networking of teachers. Computer technology was used to enable educators to access research-based knowledge. It also enabled them to interact with researchers, discuss school reform issues, collect data,
and create effective communication with others (Livingston & Castle, 1989).

In an analysis of the MIL project, Castle, Livingston, Trafton, & Obermeyer (1990), collected data from computer log files, printouts of paperwork generated from the network that connected the various locations and sites together, and telephone interviews with participants. They concluded that conditions that facilitated the use of the network were (a) having access to workstations, (b) having face to face training and interaction, (c) having money for contracts and conferences, and (d) having familiarity with computers and other networks. Castle, et al., (1990) concluded that those factors that inhibited the use of the network were (a) lack of time, (b) lack of experience, (c) issues of role clarity for researchers regarding teachers, and (d) software problems. Overall, they found the network effective for increasing the use of research-based practices by the participants.

In summary, the major issues with research-based knowledge were related to access strategies for understanding research, and time to use the strategies. When asked, 70% of the participants in the Castle et al., (1990) study indicated that the MIL networks facilitated the use of a research knowledge base. The authors felt that
teachers and researchers who participated were "reaching out, looking for new ideas and re-examining their practices" (Castle, et al., 1990, p. 21). This study found that research-based knowledge could be implemented when pragmatic barriers were removed or minimized. Removing these barriers assisted educators in the use and understanding of the knowledge contained in research.

Robinson (1998) identified the issue of a "mismatch between educational research methodologies and the generic features of practice" (p. 17). According to Robinson, research may be disregarded because it does not address the problem-solving processes that educators use and researchers seek to change. With regard to the research to practice gap, Robinson suggested that researchers do not know the methodological approach necessary to engage educators. Thus, he proposed a model (i.e., Problem-cause methodology) to provide researchers with a method of collaborating with educators. Three steps were proposed in the model for assisting researchers and educators in the identification of solutions to practical problems: (a) a detailed description of the problem, (b) identification of the constraints, and (c) mapping the interrelationships between constraints. Constraints were identified as conditions that define what counts as an acceptable
solution for the problem. Through identification of all the constraints, educators may better understand and be willing to adapt to necessary changes, thus making the use of research-based knowledge more practical. The key, according to Robinson, was whether the "methodology engaged rather than bypassed the implicit theories of those who control the targeted practices" (Robinson, 1998, p. 25).

The Relationship Of Research-Based Knowledge To Educator Beliefs and Attitudes

Teacher beliefs about the use of research-based knowledge have important implications on how teachers understand and apply research. Zeuli (1992) investigated how teachers read research, based on their prior beliefs. Two volunteer groups were selected, one with teachers experienced in collaboration, and second with the teachers having little or no experience in collaboration. They were given three different kinds of research articles. The first article was a quasi-experimental study, the second was a descriptive study, and the third was an historical study. Teacher responses were analyzed based on self-descriptions and observations of what they actually did during their reading of the article. Teachers responded to what types of research they found credible and the degree to which the
research might benefit them. Teacher responses were examined against items thought to be effective tools in understanding the article. Teachers received points for answers that were similar to Zeuli’s.

Zeuli found that teachers needed time and encouragement in order to identify meaningful assumptions in the research and to assimilate them into the classroom. Findings indicated that educators utilized personal translation of the research articles rather than interpretations that were based on the established assumptions of the professional texts used in the training intervention. For example, teachers in the study reported their conclusion about an article without any concern for supporting evidence. It was the teachers’ opinion that the supporting evidence would be found in applying the strategy or idea in their classroom.

Zeuli concluded that the method in which teachers read research influenced their interpretations. Teachers typically do not have the specialized knowledge of research and thus read primarily for research to apply in the classroom. Teachers need encouragement to identify key elements in the research studies without having to understand all of the technical methodology that is contained in research studies. Zeuli indicated that accessible, explicit
descriptions of these elements would be relevant as a framework for assisting teachers in reading and interpreting research.

Research Concerning the Translation of Research into Practice

Researchers provide information that has been subjected to systematic analysis under rigorous standards. This information is typically published according to an explicit structure with technical language that is often difficult for educators and teachers to interpret. Also, research topics generally have been found to lack specificity regarding the immediate issues confronting teachers. The roles between researchers and educators have been characterized as being necessary and complimentary (Carnine, 1997; Casanova, 1989; Zeuli, 1992). There continues to be a need for dialogue to occur between the two parties. This requires that primary research be translated or synthesized into meaningful information and allow educators to interpose their own interpretation and experience with the knowledge gained from research findings. Educators can then develop techniques and strategies that are unique to the context of their classroom.
In an effort to incorporate research-based knowledge into University of Wisconsin teacher education (Office of Educational Research & Improvement, 1988), a curriculum for teachers was developed that included research concerning effective instruction and classroom management for use by pre-service secondary school teachers and professional teacher development courses. The purpose of the study was to use research about effective teaching as a basis for improving teacher-training courses and to integrate the training with field experiences that were related to that training.

The University of Wisconsin study included 25 prospective secondary school teachers, 20 cooperating teachers, and 47 cooperating teachers who functioned as a control group. At the beginning of the study, the assigned cooperating teachers were assessed and found to have similar responses regarding their perceptions of prospective teachers in relation to their upcoming field experiences prior to the planned intervention. No mention of research was made as a source of knowledge at this point. The intervention involved a six-credit workshop incorporating the use of research-based knowledge for the prospective teachers to be combined with their field experience as an experimental intervention. The
intervention involved five phases including: (a) a preliminary advisory group who developed a questionnaire and helped to design the coursework and identify the research-based training strategies to be incorporated, (b) workshops for cooperating teachers, (c) infusion of research-based pedagogical training into two teacher education courses, (d) creation of teacher development schools, and (e) a new course (Introduction to teaching), that substituted for field experience. Thirty-four cooperating teachers completed the intervention. Observation and analysis through the development of an instrument were used to gather data. A control group of cooperating teachers did not receive the training.

The results indicated that all of the cooperating teachers, who participated in the study, used research-based teaching techniques and demonstrated the required behaviors to their prospective student teachers. The use of research-based knowledge was substantially more for the trained teachers than for the untrained cooperating teachers. The implications were that the model greatly enhanced the use of research-based knowledge in practice for those teachers who received the training. Project models such as this, can enhance the practice of using research-based knowledge in teacher education.
In looking at how and to what extent the application of research is addressed in textbooks intended for educational consumers, Erion and Steinley (1994) found that very little attention was paid to research applications. They analyzed six texts published between 1988 and 1993. Textbooks were selected that had appeared over the last six years specifically intended for consumers (e.g., students, and practitioners). The perspective of several expert researchers was used in a systematic process of making the final textbook selections. The applicability of the research to the practical context of the teacher/practitioner needs in the classroom was not described in most of these books except in the introductory remarks. The authors described these texts, as providing the content needed to understand and evaluate research but without intent to translate it into practice. The knowledge of the practitioner was devalued wherever it was found in these texts. For example, in some texts, when comparing approaches to making decisions, practitioner knowledge was rated behind the other methods noted. The texts did address generalizability when discussing external validity but did not address the application of research to practice. Erion and Steinley concluded that these issues partially explain the reasons why the reading and use of research by
educators is not helpful. There were only six research textbooks used in this study. No data were provided regarding the number of textbooks from which the final six were selected. This limits the amount of generalizability of the findings given the voluminous number of texts in print on the subject of research. The perspectives of several researchers used to evaluate the selected texts for research application provided validity to the selection process.

In a study conducted to identify successful strategies for the translation of research into classroom practice, student teachers were required to develop and evaluate a sequence of reciprocal teaching lessons and then apply them to children they worked with in their field placements (Speece, et al., 1997). Reciprocal teaching was described as a method of teaching reading comprehension through instruction initially led by the teacher toward independent active participation on the part of the student. Case studies of three student teachers were evaluated.

Research on reciprocal teaching was taught in combination with a field placement as part of a semester course for student teachers enrolled in an undergraduate course on Oral Language and Communication Disorders. Problems, adaptations, and perceptions of students were
then analyzed. In the context of a class assignment, reciprocal teaching was a technique for increasing verbal participation of students with learning disabilities. Each student teacher was required to put together a sequence of reciprocal teaching lessons in their field placement with students for whom they were responsible. They tape-recorded a specific lesson and produced a report of their experiences. Students were reported to have successfully increased the quality and quantity of verbal participation in the lesson presentations from children who were the recipients of the research-based teaching strategies. The study also concluded that adaptation of the research material on reciprocal teaching to the local classroom was a difficult task due to the lack of available translation skills, and time to translate required by the teacher. This was a key point identified as an outcome of this study. Translating research into practical application for the classroom ultimately is the responsibility of the teacher. This study was largely anecdotal and qualitative. The experiences of only three pre-service teachers were reported. This would render this strategy limited in any attempt to generalize to other student teachers or educators. A benefit of this study is that it demonstrated how research can be made to fit into a practical
application and provided a rich description of the issues that emerged in the attempt to accomplish this task.

Having identified discrepancies in the application of research in classrooms, Lovitt & Higgins (1996) identified a research to practice gap. They identified six steps for assisting teachers in translating research into practice as part of an all day workshop for ten experienced secondary teachers. As an example of a typical intervention, the topic of self-management was presented to the teachers in the workshop. Teachers reflected on the concepts of self-management and were informed about the following steps in the program: (a) beginning a self-management project, (b) visits from project personnel, (c) communication between the school and the university that sponsored the project and follow-up meetings. Teachers implemented six steps. They were: (a) to identify a subject-matter to be taught, (b) discuss the research, (c) do follow-up, (d) reassemble and discuss results, (e) train other teachers in the model, and (f) meet with officials to expand the project. This was implemented under actual conditions over a period of four months. The teachers were pleased with the progress demonstrated by their students. All the teachers were found to have initiated projects that were successful and teachers planned to continue with the self-management
instruction beyond the conditions of the project. The process created opportunities for educators to practice what they had learned with support and encouragement.

The process of translating research into practice can result in new knowledge (Tushnet, 1992). In teacher education, obtaining research-based knowledge information is typically viewed as an end in itself that results in additional information but not new knowledge. An alternative opinion according to Tushnet is to see new knowledge as a result of the application of research by the educator within the context of their classrooms. This opinion takes the research interpretation process from a spectator opinion to that of a user opinion by offering a more realistic accounting of the information within the context of the practical environments used by educators. Three types of knowledge are needed by teachers in order to accomplish effective teaching: subject matter knowledge, research-based knowledge, and knowledge within the local context. Tushnet proposed that the practice of synthesizing research-based information should include the participation of educators and practitioners who can bring the local context into perspective.

Using the concept of coaching as a means for translating research into practice, Gersten, Morvant, and
Brengelman (1995) used a qualitative research method to analyze strategies for introducing research-based knowledge to educators who taught students with learning disabilities. Project staff who had extensive experience in classroom consultation coached the educators. Three main principles were incorporated into the process: (a) intensive observation and feedback incorporating research-based instructional ideology, (b) observations that include analysis of the instructional impact on students, and (c) suggestions by coaches that are specific and sensible within the context of the classroom. The hypothesis of the study was that the pairing of the coaching process with the acquisition of new research-based knowledge would greatly enhance the implementation of the research in the practice of teaching. This would be accomplished through the provision of intensive and ongoing feedback to educators, and opportunities for discussion in a collaborative atmosphere.

Elementary teachers in a large inner city school participated in the coaching project over a two-year period. The principles were implemented and resulted in a weekly plan of action for how the teacher would use new research-based strategies. Data analysis occurred through (a) audiotaping of meeting and planning sessions (b) asking
researchers and all parties to discuss and justify their perspectives, and (c) analyzing independent observations that occurred throughout the project.

The results were varied. The change process with teachers occurred in an inconsistent manner. The authors concluded that the irregular results were due to the individual variation in how teachers incorporate new research-based techniques into practice. They also found that teachers were anxious about being evaluated. The special educators were more systematic than general educators in their approach to using the new strategies.

Gersten, et al., (1995) indicated that teachers need to be encouraged to identify strategies and define instructional problems on their own. Based on their results, it was suggested that initiating learning through a variety of research-based teaching strategies can greatly enhance the outcome. Unfortunately this study was confounded by the fact that coaches identified the source for the research-based knowledge that was to be communicated to the teachers. The district administrator selected these coaches. No explanation was offered for how the research-based suggestions were identified. Also, the extent of the coaching varied from teacher to teacher, therefore compromising internal validity.
Criticisms of Previous Research and Opinion on Research-Based Knowledge

The failure of research to inform practice has been largely attributed to questions that involve the lack of researcher attention to the context of the individual needs of the teacher for the development of a research-knowledge base (Kliebard, 1993). It is unlikely that teachers will take an active role in using research to inform practice unless researchers are actively involved in a shared perspective with the teacher regarding their learning needs and teaching styles in the classroom (Kliebard, 1993). Research to date has not been able to adequately overcome this gap, and research has also been said to have more to do with what researchers believe to be relevant, than to do with anything practical (Elmore, 1993). It would appear that there is no real incentive for researchers to change their methods of identifying topics or to begin to address research in real world applications.

Researchers tend to blame educators for not using or understand research. Educators, on the other hand, largely avoid tackling the problem because of their feelings that researchers hold a higher status (Casanova, 1989). There is an assumption by researchers that research permeates the
training that teachers get, and there is no need to build an ongoing personal review of research into the educators' role. The bottom line is that it does not appear that anyone is actively seeking genuine scientific based solutions for identifying and solving the research to practice problem.

The process of translating research into practice presents several problems such as the idea of what is an appropriate knowledge base for education. Palincsar and McPhail (1993) in criticizing Wang et al., (1993) effort to identify an appropriate definition of a knowledge base of school learning, offered the following regarding research. Methodology employed in research is typically flawed because of the lack of continuity regarding researcher perspectives and the context of the practical application of the research. Because researchers typically do not work in the settings that they research, it is said that their perspective fails to understand the views of teachers, parents, and administrators. A knowledge base cannot be complete if it omits those who are attempting to apply the research in a real world setting.

Research-based knowledge has been viewed as a directive for practice. However, research-based knowledge is only one resource that may be used to determine methods
to enhance the learning of students (Kerdemen & Phillips, 1993). Questions concerning the distribution of power, equity, and fairness between educators and researchers have been identified in the literature, but have remained unanswered. No one as of yet has presented empirically validated methods for modifying research in a manner that directly and efficiently informs practice within classroom contexts. Collaboration techniques for both teachers and researchers must be developed in order for the two groups to debate and interpret the values and assumptions that are inherent in the research so that it will be useful for teachers in their classrooms. Currently, these techniques have not been presented in the literature.

There are many opinions offered by scholars as to this lack of literature. Maeroff (1988) maintains that educators are not sufficiently respected by themselves or by others and, thus, may be inclined to shy away from efforts to collaborate with each other. Another reason offered by Maeroff is that teachers do not have adequate knowledge and training about enhancing their own power and influence to change the way teacher education is developed. Researchers have not addressed this problem due to the lack of pressure from educators and administrators (Maeroff, 1988).
A meta-analysis conducted by Wang, Haertel, and Walberg (1993) attempted to identify a systematic knowledge base for educators that was grounded in research. They identified a theoretical framework from the following sources: (1) data compiled from research experts, (2) meta-analyses, and (3) numerous textbook chapters and narrative reviews. Thirty categories involving 228 variables that influenced learning were compiled and analyzed. Additionally, the data were analyzed using content analysis and expert ratings. What they found was an indication of an emergent knowledge base from a variety of disciplines. The variables that Wang, et al., (1993) found to be the most powerful were: (a) psychological variables (e.g., comprehension or self-control strategies of students), (b) classroom instructional variables (i.e., prompting and efficient handling of routine tasks or having materials ready to be used) and (c) variables in the home environment (e.g., parent activities and attitudes regarding student learning). The authors concluded that knowledge of these variables would provide educators with the ability to have a greater impact on student learning.

Wang, et al., (1993) provided evidence of an emerging knowledge base that can be used to systematically enhance the ability of educators to strengthen the learning of
their students. The contributions of many primary researchers suggest that there are some variables that have a more significant impact on student learning than other variables (e.g., district and state policies). There is little evidence, however, regarding what methods teachers need to access and interpret research results to make the knowledge base part of their personal experience.

In the research and information that has been provided in this literature review, their has been a noticeable lack of instrument development for measuring teachers knowledge, attitudes, and beliefs concerning the use of research-based knowledge in the classroom. While some studies addressed the concerns of teachers and educators (Casanova, 1989; Fleming, 1988; Livingston & Castle, 1989; Zeuli, 1992), they did not validate instruments for assessing the information they gathered in their reports. This lack of validated assessment of teacher knowledge, attitudes, and beliefs about research-based knowledge represents the missing empirical data needed to clarify the role of research-based knowledge for teachers in the classroom.

Summary

The translation of research into practice as a source of research-based knowledge for teachers and educators to
use in practical applications has only emerged within the last 20 years. Research-based knowledge is rapidly replacing the prevalence of expert opinion and experience as the primary knowledge source for educators. In the 18th century, effective teaching practices were in the hands of experts who based their knowledge mostly on past experience and what little research was available (Landsheere, 1987). In the early 19th century, the prevailing approach to teaching involved the practices being passed on from institutions of the past. Teacher effectiveness and personal characteristics dominated research efforts up until the 1950s and 1960s when societal demands for accountability from commercial and industrial sectors brought about a stronger effort to produce a research base in educational practice.

Early research was conducted primarily to examine the impact of teacher behaviors on student learning but failed to define various types of interactions and their relationship to student outcomes. In the 1970s, this problem was overcome by research linking teacher behaviors to student achievement gains. Results of studies indicate that there are significant problems resulting in a gap between research and practice such as: (a) access, (b) translation, (c) topics relevant to teacher needs, (d)
realistic settings, (e) realistic sample populations, and (f) time to read research. This is particularly true for teachers and practitioners attempting to apply findings in classrooms.

For research-based knowledge to be an effective tool, it must be presented in ways that are meaningful to teachers. Efforts to synthesize research findings may make it possible for research to become more accessible to teachers. Criticisms of synthesized research are that the abstracted information actually results in the new information lacking some of the context that was the intent of the original author.

Research-based knowledge has been criticized as being promoted as an end to itself. Teachers and educators are the passive receivers of this knowledge and are expected to apply it without regard to the problems previously described above. The result has been teachers who rely more on the experiences of other teachers instead of research, thus, overlooking the potential for valuable information derived from research literature that can create more effective and efficient learning conditions for the educational system. The impact of this has led to the conclusion that teachers need to be informed about research findings and need to be able to access and translate
research findings in order to be able to function as professional educators in the current educational environments. Reading research is important in teacher education.

Teacher attitudes and beliefs need to be considered as a major influence on how they read and understand research. Teachers are not passive recipients of knowledge. They interact with their classroom environments on a daily basis. The teachers have their own perceptions and unique understanding of the needs of their students. Researchers need to collaborate with teachers to gain an understanding of this perspective. Teacher perspectives and needs in the context of their classrooms should be considered by researchers in order to assure that research-based knowledge can be a benefit to teachers.

The knowledge-base regarding teachers using research in practice described in this literature review has not been derived from clear research-based evidence. The problems that have been discussed have not typically been found to have solutions that have empirical research to back them up. In order to clearly understand the perceptions and knowledge teachers have concerning research-based knowledge, empirical inquiry using validated instrumentation to rule out various external and internal
variability in responses is needed. This will assure an appropriate focal point on the identification of problems and solutions in closing the research to practice gap between researchers and educators.
CHAPTER 3

METHODOLOGY AND RESULTS

Overview

Given that a research to practice gap exists between educators and researchers (Carnine, 1997; Kauffman, 1996; Livingston & Castle, 1989; Lovitt & Higgins, 1996), a Universal Format (Warby, et al., in press) to provide step by step guidelines to assist educators in accessing, reading, and translating primary intervention research into practice was developed. This study sought to formatively evaluate instruments to measure the use of the Universal Format for translating research into practice for educators.

Formative evaluation is said to be one of the most practical, cost-effective methods of validating newly developed instructional materials before they are put into regular use (Baker & Alkin, 1984; Beyer, 1995; Braden, 1992; Gall, et al., 1996). Formative evaluation involves (a) planning the design, (b) developing a prototype, (c)
conducting a pilot test on a small user sample and (d) the field testing of all components on a representative sample until validation is achieved (Gall, et al., 1996; Pratt, 1980; Schaffarzick & Hampson, 1975). This study was designed to complete the formative evaluation of instruments in order to field test the Universal Format on a representative sample. Five phases were conducted to complete this formative evaluation.

The quasi-experimental interventions were conducted at the University of Nevada, Las Vegas. Students enrolled in graduate coursework in special education were the target population for Experimental and Control groups.

Las Vegas has one of the fastest growing school districts (Clark County School District) in the nation and as such, has an unusually high demand for educators in both general and special education. There are thirteen full time faculty and a growing enrollment over 400 students in the College of Education, Department of Special Education at UNLV. One outcome for these students, if they were to use the Universal Format, could be the enhancement of their skills in reading, interpreting, and using research in classroom practice. Therefore, the use of this population for ascertaining the benefits of the Universal Format
appears to meet the needs of this formative evaluation study.

Phase 1 involved developing the questions for the instrument to measure the Universal Format and establishing the target groups. A review of literature was conducted regarding teachers' use of research in the classroom. A series of questions were initially submitted to a group of graduate student teachers for comment. Their comments were interpreted and used to select items for the instrument.

Phase 2 involved the development of a blueprint of specifications for the instrument. The items were pooled for each section. A prototype of the instrument was developed. The prototype was then evaluated by a group of doctoral students and revisions were completed.

Phase 3 involved pilot testing the Universal Format and the instrument using a quasi-experimental design. Three different groups of university graduate students in special education coursework participated. A training module was incorporated into Group 1. In addition to the training module, error logs and annotated materials were collected from subjects to identify changes that would enhance the training module for future use. Research articles were translated incorporating the training the students received. An intervention that incorporated the procedures
(steps in the Universal Format) discussed in the article Warby; et al. (in press) was used as a format for Group 2. Students were instructed to translate research articles using these steps. Group 3 was a control group. The Control group translated research articles with no direction or materials from the investigator. In all three groups, subjects were required to interpret three research-based articles. Interrater reliability was calculated and an item analysis was conducted.

Phase 4 involved expert review of the instruments. The experts performed content validation and qualitative evaluation. Their feedback was used to modify the instrument and training module.

Phase 5 involved creating a final version of the questionnaire based on data gathered during Phase 3. Efforts were made to make the questionnaire more user-friendly and to delete questions that were repetitive or that did not add additional information to the subscales.

The design, instrument development, quasi-experimental evaluation and expert evaluation took place in the fall and spring semester of 1997-98 academic school year. The purposes, procedures, and results of the five phases in this study are discussed in the remainder of this chapter. Combining the method and subsequent results seemed
appropriate given that each phase used a distinct methodology.

Phase 1

The purpose of this phase was to formatively evaluate the instruments and to identify the target groups. The Universal Format was designed as a method for assisting teachers in locating, reading and translating research into practice. It is well known that there is limited use of research-based knowledge by teachers in the classroom as pointed out in the literature review of this study. As stated before, there have not been any validated instruments developed to measure the knowledge, attitudes, and beliefs of teachers regarding the use of research-based knowledge in the classroom. In order to evaluate the benefits of using the Universal Format, instruments were needed to identify any changes that may occur as a result of using the Universal Format. The purpose of this phase was to identify question items for an instrument.

Method

Setting. Students selected as the target population for this phase were enrolled in a special education course at the University of Nevada, Las Vegas. Students were enrolled in the fall semester of 1997 academic school year.
The course was titled "Introduction To Mental Retardation," designed to survey the characteristics, training, and educational needs of students with mental retardation. The coursework occurred in classrooms on the university campus. The instructions for answering the questions took place in the classroom at the beginning of class during mid-semester.

Participants. A non-random convenience sample of 21 students volunteered. All were practicing teachers at the time. The mean age for participants was 33.3 (SD = 10.8, Range 23-54). Of this sample 17 held a Bachelor of Science degree, and four held a Masters of Arts degree. There were six men and 15 women. Ethnic distribution included, 32.7% Caucasian (n = 16), 8.2% African American (n = 4), and 2.0% American Indian or Alaskan Native (n = 1). The average number of years of full-time teaching experience was 5.61 (SD = 6.41, Range = 0-20).

Instrument. This phase incorporated the information gathered in the literature review regarding research-based knowledge and its relationship to teachers into specific questions. The initial version of the instrument was given to the students who were asked to complete the questions and give open-ended comments concerning the questions.
Further, they were asked to give feedback regarding the topic of putting research into practice for teachers.

**Procedures.** All the students were given a sample of questions that would potentially be targeted for a questionnaire instrument for the formative evaluation. They were instructed to answer all the questions to the best of their ability. The students were asked to make comments regarding the level of difficulty, any grammatical or spelling errors, and structural problems. The primary goal was to determine readability and select questions that would be appropriate for the study. Students were timed for completion of the questions. This was done to determine how much time would be needed to complete the questionnaire. The goal was to keep it under fifteen minutes. Open-ended comments were solicited and incorporated into the next version of the instrument.

**Results**

No studies were identified that had instruments available for measuring teachers knowledge, attitudes and belief concerning research-based knowledge. Most of the comments addressed structure and readability (see Appendix C for examples of specific comments). Other concerns included statements or questions that were considered repetitious.
Many wrote comments when they were unsure which box to fill in to answer the particular question. This indicated the need for explicit instructions. Several statements were related to questions that did not make sense. Requests were for some questions to be more specific (e.g., a demographic question asking students to identify their preferred level of teaching needed clarification). None of the questions completed during this phase were deleted as a result of the input from this group of students, leaving the questionnaire with a total of 52 items.

The duration of time for completing the questionnaire was 6 minutes. Approximately 15 minutes was needed for distributing, explaining, completing, and collecting the questionnaire.

Based on an interpretation of the results the content for sections of the questionnaire concerned (a) background information (demographics), (b) research in the classroom, and (c) inclusive practices in the classroom. The inclusive practices item was included as a method for determining the amount of knowledge teachers have regarding research on inclusion. Inclusion of children with disabilities in the general education classroom is a controversial subject often viewed from a political or emotional framework rather than from an empirical-base. By including this topic, it
was thought that important information could be discovered about teachers' attitudes, beliefs, and knowledge regarding inclusion. This would then provide an example of how research versus opinion influences teachers' attitudes and beliefs.

Phase 2

Once the questionnaire items were finalized, refinements were made to the item format. The purpose of phase 2 was to further refine the instrument for use in phase 3 of this project.

Method

Participants. Each of the subjects for this phase was enrolled in graduate coursework at UNLV. Each subject completed his/her evaluation of the content of the questionnaire and independently returned their materials to the author within two weeks of its issuance. The subjects volunteering to participate in this phase were doctoral students in special education from the University of Nevada, Las Vegas (N = 6). Of these six, four were practicing teachers in the local school district, one was a full time student with a background in occupational therapy, and one other was a school psychologist. Each
doctoral student had prior familiarity with the Universal Format from previous coursework.

**Instrument.** A blueprint of specifications was written pooling items under specific headings (see Appendix B). This prototype of the questionnaire was administered to the participants.

**Procedures.** The questionnaire was given to the participants. The group completed the questionnaire and provided feedback regarding content, grammatical errors, and structural errors. The questionnaire was modified according to the doctoral students' findings and finalized for administration to the Experimental and Control groups in Phase 3.

**Results**

Comments from the doctoral students included both structural and content related concerns and noted items that needed further clarification. These comments were assessed for their merit and incorporated into a revised instrument for the next phase. The items were categorized under the major headings of demographics, research in the classroom, research-based knowledge, and attitudes and beliefs about research-based knowledge. The latter was added in an effort to determine changes in attitudes and beliefs after exposure to using the Universal Format in
translating research articles (see Appendix A). The topic of inclusion was dropped due to it being outside the scope of the current study. The questionnaire (see Appendix D) included (a) a page of instructions, (b) an attachment that requested the subject to provide feedback about the experience of taking the pre/post test questionnaire, and (c) a statement of informed consent (see Appendix E).

Phase 3

In Phase 3 the questionnaire was administered to three groups of subjects in order to examine the effects of using the Universal Format. Additionally, it is at this point that the second instrument, a training module, was developed and tested. The training module was created to provide a comprehensive review of the Universal Format for use in translating research into classroom practice. This training module incorporated the rationale, procedures, and model from Warby et al., (in press).

Subjects for the two Experimental (Groups 1 and 2) and one Control group (Group 3) were recruited from three separate graduate level special education courses. Group 1 received the training module, Group 2 an article on the Universal Format, and Group 3 (the Control group) received
no intervention. All three groups were required to translate research-based articles.

The purpose of Phase 3 was to determine whether the interventions would change the subjects' attitudes and beliefs regarding research-based knowledge. Further, the reliability of the instrument was examined. Through analyzing research translations, subject feedback, and error logs, and conducting an item analysis and determining reliability, the instrument was revised for Phase 4 where expert evaluators were asked for their comments.

Method

Participants. Fifty-two subjects were selected from three Special Education Masters Degree courses at the University of Nevada, Las Vegas. Subjects in Group 1 were enrolled in a graduate course titled "Adaptive Curricular Programming for Persons with Mental Retardation." It provided an in-depth analysis and application of curricular development and implementation for persons with mental retardation. Subjects in Group 2 were enrolled in a graduate course titled "Communication Programming for Persons with Severe Disabilities." The objective of this course was to study disorders affecting communication of persons with severe disabilities. Emphasis was on developmental considerations, ecological needs, clinical
assessment, and selection and implementation of augmentative communication systems. Subjects in Group 3 were enrolled in a graduate course titled "Math Methods in Special Education." This course was designed to introduce effective classroom methods and strategies for assessing, teaching, and monitoring the mathematical performance of students with learning disabilities.

The sample size for this Phase was small. It should be kept in mind that generalization to the general population is not the primary intent at this stage of the formative evaluation process. In order to reduce the amount of Type 1 error, a decision was made to exclude those subjects who did not complete all three article translations from the final analyses. One subject was dropped from the Control group, reducing the sample size from 21 to 20; and two subjects were dropped from Experimental group, reducing the sample size from 19 to 17.

**Group Demographics for Phase 3.** Group 1 (n = 19), the Experimental group that received the training intervention. The mean age of this sample was 37.95 (SD = 10.22, Range = 23 - 54). There were five males and 14 females. Twelve had earned their Bachelors of Science degree, 6 had earned their Masters of Arts degree, and one held a degree as an Education Specialist. The majority of this sample were
Caucasian (84.2%, n = 16), 5.3% (n = 1) were African American, and 10.5% (n = 2) were Asian or Pacific Islander. The average number of years of teaching experience was 7.05 (SD = 8.58, Range = 0 - 13).

Group 2 (n = 10), the Experimental group that received no training intervention but read the Warby, et al., (in press) article, had a mean age of 40.0 (SD = 9.24, Range = 25 - 53). There were 6 males and 4 females. Four had earned their Bachelors of Science degree, and five had earned their Masters of Arts degree, and one subject did not specify the degree held. All subjects were Caucasian. The average number of years of teaching experience was 6.8 (SD = 8.42, Range = 0 - 26).

The Control group (group 3), had a sample size of 21. The mean age of this sample was 33.38 (SD = 9.68, Range = 23 - 54). There were six males and 15 females. Fifteen had earned their Bachelors of Science degree, four had earned their Masters of Arts degree, and one held a degree as an Education Specialist. The majority of this sample were Caucasian (52.4%, n = 11), 19.0% (n = 4) were African American, 9.5% (n = 2) were Hispanic, and 9.5% (n = 2) were Asian or Pacific Islander. The average number of years of teaching experience was 2.95 (SD = 4.16, Range = 1 - 5).
Procedures

**Group One.** Subjects who were assigned to this group received the pre-test questionnaire. In addition, they received the training module intervention and completed error logs for the article translations.

Subjects completed the pre-test questionnaire at the beginning of the semester prior to the implementation of the intervention. The syllabus for the course contained an assignment to translate two pre-selected research articles. A third research article, an empirically based research article chosen by the subject was also included. Prior to any translations of these articles, a sequence of procedures was implemented. A copy of the article by Warby, et al., (in press), regarding the Universal Format and instructions for how to use were given to each subject. A one hour training module designed to assist educators in understanding the benefits and issues related to using research based information in the classroom was presented (see Appendix F). Next, a one-hour session was conducted to instruct subjects in how to implement the Universal Format. Subjects were then asked to complete the first research article translation and return it two weeks later. The completed research translations were gathered on the due
date and analyzed for the subjects' use of the Universal Format.

This information was compiled and analyzed and used to provide feedback to the subjects the following week. The feedback included examples of acceptable translations. The error logs were used to allow students to reflect on their experience in using the Universal Format. They were asked to identify any errors or problems that occurred while completing the translation of the research article. Discussion occurred as a part of this training session with subjects regarding the identification of any modifications that would be necessary prior to the next attempt at translation.

The second article translation was due two weeks later. Again, the articles were collected and analyzed. Feedback was provided the following week after the article was turned in based on this information. Subjects received additional instruction in locating research-based information in the library in order to assist them in accessing the third research article for their final article translation. The only restriction on the selection of this article was that it be research-based. All subjects in the Experimental group turned in their final article translation, which was analyzed, and feedback again was
given one week later. For all three-article translations, feedback consisted of a brief review of the previous training session, a review and discussion of items completed correctly, and of areas, that needed improvement. Practice sessions for those areas determined to need improvement were conducted.

At the final session of instruction, subjects were given information on more advanced kinds of research analysis that would further clarify whether or not the research would be suitable for use in the classroom during this session. Subjects were instructed about the developmental nature of acquiring an understanding of research methodology and were informed about the benefits of continuing to develop and refine their skills in translating research.

Group 2. Subjects in the second group were enrolled in a separate graduate course in special education. Group 2 also completed the same pre-test questionnaire using the same procedures as described for group 1. The intervention for this group was giving the subjects, an article (Warby, et al., 1997) that describes how to on translate research into practice. The purpose was to use the article as a format for translating three research articles. The course instructor provided subjects in this group the option to
translate three research articles or to complete an alternative journal assignment that was part of the regular course assignment. Subjects choosing the article translation option were required to translate the same two pre-selected research articles used by group 1. For the third translation, subjects, as in group 1, selected an empirically based research article of their own choice. Subjects were instructed to use the article (Warby, et al., 1997) as a guide for translating the research articles. No further instructions were given as an element of this study throughout the remainder of the semester.

Group 3. The subjects in this group were enrolled in a graduate course in special education math strategies. No experimental intervention was provided to this group. The course syllabus was modified to include the assignment to translate two pre-selected research articles. These articles differed from the articles in groups 1 and 2. This difference in article selection was because the nature of the material being taught in this math methods course was so significantly different from the other two courses. The third article translation, as with the other two groups, was of their own choosing as long as it was empirically based. Subjects were not given the article on the Universal Format and were not given any other material or instruction.
as a part of this study. The course instructor provided directions regarding the assignment (see Appendix G).

Coding. To assess participants' opinions on the perceived benefits of research-based knowledge they were asked to respond to the following question: What are the benefits to using research-based knowledge? Respondents were asked to check all that apply from the following response options: 1) Improved classroom performance, 2) Standardized achievement goals, 3) Save time by avoiding trial and error, 4) Provides support for the type of instruction used in the classroom, and 5) Offers solid evidence regarding reliability and validity of results. Answers were coded one if the respondent endorsed the item and zero if the item was not endorsed. A composite score for each subject was calculated by adding together the coded responses. The range of possible scores, then, is zero to five. Higher scores indicate more perceived benefits to using research-based knowledge.

To examine the extent to which participants felt they were informed about research-based knowledge, the following question was asked: How well informed are you about the following? Participants were then given six statements about research-based knowledge and were asked to respond on a 4-point Likert scale where 1 = very well informed to 4 =
not well informed. The statements presented were as follows: 1) The influence research-based knowledge has on the practice of education, 2) Components of well-designed research, 3) Conducting research, 4) Finding and locating research, 5) Interpreting research, and 6) Translating research into classroom practice. A composite score was calculated by taking the average of the six responses. Lower scores indicate that the respondent is better informed about these issues.

Attitudes and beliefs regarding research-based knowledge were assessed with a 27-item scale (see Appendix H). Participants were asked to read each belief and respond to it on a 5-point Likert scale where 1 = strongly agree and 5 = strongly disagree. A composite beliefs score was calculated for each subject by summing the totals of all of the responses. Lower scores indicate stronger positive beliefs regarding research-based knowledge.

For each intervention, subjects were required to translate research articles. Those translations were scored for content and accuracy in using the universal model. Scores for interventions were based on a 1 to 50 point scale; with 50 being the best example of a research article translation. Two independent raters (the author and a Doctoral Student colleague) were used to evaluate the
translations. An example of the scoring sheet for rating the research articles is presented in Appendix I. Each article translation was evaluated using the following dimensions: 1) title, 2) abstract, 3) evidence, 4) method, 5) identification of consumers, 6) concluding statements, 7) interpretation of findings, 8) procedures, 9) reference, and 10) modifications. The translation key for the research articles is presented in Appendix J.

**Results**

**Comparisons among three groups on demographic variables.** A between-subject analysis of variance (ANOVA), with Group as the independent variable and the demographic variables (age, sex, teaching experience, and degree earned) as the dependent variables, was computed. There were no differences among the three groups on any of these demographic variables: $F(2, 47) = 1.90$, for age; $F(2, 47) = 1.93$, for sex; $F(2, 46) = 1.92$, for teaching experience; $F(2, 47) = 1.62$, and $F(2, 46) = 2.39$, for degree earned, $Ps > .05$.

**Withdrawal of Group 2 from the Study.** At this point in this study, the decision was made to drop this group from all further analyses due to the small sample size and the amount of missing data from these individuals. The remainder of this manuscript will deal only with the
Experimental group that received the training intervention (Group 1) and with the Control group (Group 3). To reduce the amount of confusion, Group 1 will now be referred to as the Experimental Group and Group 3 will be referred to as the Control Group.

Comparison between Experimental and Control groups on benefits, informed status, and beliefs.

A Mixed Between-Within Subjects ANOVA was run for the three major study variables: benefits, informed status and beliefs combined with group (experimental vs. control) as the independent variable and pre- and post-test as the within subjects variable (Table 1 presents the means and standard deviations of the pre- and post-test measures on benefits, informed status, and beliefs for each group).

Benefits. For the subjects' opinions of the Benefits of research-based knowledge, there was no interaction between the pre/post measures and group. A statistical significance was not found between the Control and Experimental groups on Benefits, $F(1,34) = .057, P > .80$. However, there was a statistically significant difference between pre- and posttest scores on benefits for both groups, $F(1,34) = 11.52, P > .01$. 

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**Informed Status.** For the question of how informed participants believed they were about research-based knowledge, there was no interaction between the pre/post measures and group. Again, there was no statistically significant difference between the Control and Experimental groups for Informed Status, $F(1,34) = 2.74, P > .10$. There was a significant difference in pre- and posttest results for Informed Status for both groups, $F(1,34) = 28.16, P < .001$.

**Beliefs.** For the scores on the Beliefs scale of this instrument, there was again, no interaction. There was not a significant difference between the Control and Experimental groups for Beliefs, $F(1,34) = 1.62, P > .212$. There was a significant difference in pre- and posttest results for benefits for both groups, $F(1,34) = 15.91, P < .001$.

**Within group differences for experimental subjects.** Subjects in the Experimental group received an intervention designed to explain research-based knowledge and teach them how to use the Universal Format to translate three research articles. They were given feedback after each of their article translations. This is in contrast to the Control group who were asked to translate article, but were not given specific guidance on how to do so. As with the
Control group, a within-subjects ANOVA was calculated for the Experimental group on the responses to pre- and post-test measures for benefits, informed status, and beliefs.

Results indicate that there was a significant difference from pre- to post-test on subjects' opinions of the benefits of research-based knowledge, $F (1,18) = 12.22$, $p < .01$ ($M_s = 1.89$ and $3.26$ for pre- and post-test, respectively). Respondents in the Experimental group endorsed a significantly larger number of benefits of research-based knowledge after receiving the intervention-training module. Table 1 provides a summary of the major results from Phase 3.

For the question of how informed participants believed they were about research-based knowledge, there was a significant difference from pre- to post-test, $F (1,18) = 11.82$, $p < .01$ ($M_s = 12.98$ and $9.25$ for pre- and post-test, respectively). Lower scores indicate that one is better informed on issues regarding research-based knowledge. There is a slightly larger positive change in the scores for the Experimental group (3.73 points) than for the Control group (3.28 points), even though both changes are significant.
TABLE 1

<table>
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Note: NS = non-significant; Lower scores for Informed

There was a significant difference between pre- and post-test scores on beliefs regarding research-based knowledge for the Experimental group, $F(1,18) = 4.63, p < .05$ ($M_s = 68.11$ and 64.37 for pre- and post-test, respectively). Recall that lower scores indicate stronger positive beliefs regarding research-based knowledge. Higher scores on Benefits indicate increased positive perception.
about the benefits of Research. Lower scores for Informed Status indicate that subject is more informed; Lower scores for Beliefs indicate that subject has stronger beliefs.

Results for article translations

**Interrater Reliability.** Pearson product moment correlation’s were calculated to determine interrater reliability for the total scores for each subject. Interrater reliability for article 1 was .967, for article 2, .978, and for article 3, .944. Because of the high concordance between raters, an average of the raters’ scores for each subject was calculated. Results of all additional analyses were based on this average rater score.

**Within subjects differences for article translations**

for Control subjects. Because the order in which the article translations were completed by subjects could not be established, within subject differences could not be determined.

**Within subjects differences for article translations**

for Experimental subjects. Results indicate that there was an overall significant difference among the three article translations for Experimental participants, $F (1,16) = 9.02, p < .01$ ($M’s = 43.06, 47.65, 49.12$ for Article 1, Article 2, And Article 3, respectively). In order to determine the specific differences among the Article 1,
Article 2, and Article 3 data, paired samples t-tests were calculated. Results indicate that there was a significant difference from Article 1 to Article 2, \( t(16) = -2.56, p < .05 \); and from Article 1 to Article 3 on article translation proficiency, \( t(16) = -3.00, p < .01 \). However, there was no difference in translation proficiency from Article 2 to Article 3, \( t(16) = -1.10, \text{NS} \). Receiving feedback after the first article translation appears to improve subjects' ability to translate research according to the Universal Format, however, subsequent feedback after article 2 did not appear to make a difference in proficiency. Feedback was provided after article three but could not be measured since no subsequent article translation was performed.

**Reliability of benefits, informed status, and belief components of study protocol.** In order to begin examining the psychometric properties of the scales in the study questionnaires, internal consistency Alpha coefficients were calculated for the benefits subscales, the informed status composite, and the belief subscale. Standardized item Alpha's for the three subscales were .36, .89, and .88, respectively. The informed status subscale and the belief subscale had acceptable internal consistency alpha coefficients. The third subscale has a disappointingly low Alpha level that is due, in part to the fact that the items

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making up this subscale are not scored on a Likert scale. Efforts will be made in the next version of the protocol to reword those items in an effort to increase the internal consistency.

Phase 4

Six expert evaluators offered feedback regarding the pedagogical content, structure, and readability of the pre/post test questionnaire and the training module. The purpose was to incorporate outside input from experts as a source of information to analyze and judge how well the instruments met their intended purpose and to solicit feedback needed to produce a final product for a major pilot with a representative sample. Method

Participants. Five expert evaluators were selected from UNLV and one from the University of Montana. All five were professors in education including one professor in charge of the Center for Survey Research at UNLV. Each had extensive knowledge of survey and experimental research. Two were selected because they had extensive backgrounds related to issues of research into practice in education. Another was selected because of her expertise in designing survey questionnaires. Two were selected because of their potential as a primary user of the training module in their
teaching practices. The last person selected to provide evaluative advice was a researcher whose research could be impacted by the use of the Universal Format in practice.

Procedures. Copies of the pre-test/post-test questionnaire and the training module materials were distributed during Phase 3 to expert evaluators. Comments regarding procedures from phase 3 however, were not provided to the expert evaluators. Instructions and a feedback form were included (see Appendix K). The data from the feedback were collected throughout the course of the study and were then used to develop a final prototype questionnaire and intervention for an eventual pilot study in the use of the Universal Format.

Results

A new draft of the pre/post-test questionnaire was developed using the feedback from the expert review, error logs, and subject feedback. Expert evaluators provided feedback regarding the quality and content of the instrument and the training module. In general, they found the training module to be problematic in terms of specific material needed to assure others could implement the suggested model. Videotape was suggested as a way to assist experts in evaluating the training material. They also recommended restructuring the pre/post-test questionnaire,
especially the beliefs and attitude section to make it easier for subjects to answer. Specific suggestions were given regarding content and all were incorporated into the final draft instruments that are found in Appendix D. There were concerns about how to identify entry-level skills for the subjects. There was consensus that this training module would be difficult to use with pre-service teachers and would need to be adapted to their knowledge base and skills. Over all the experts recommended that practice simulations, additional communication activities, and presentation assignments should be added to the training module. A recommendation from one of the reviewers was to eliminate the definition of research-based knowledge from the questionnaire and place it in the instructions on the front page. Also, the instructions were simplified based on expert opinion. The information generated from the expert evaluators was beneficial to developing a new revised draft of the training module and pre/post-test questionnaire.

Phase 5

The purpose of Phase 5 was to combine the feedback given in Phase 4 with the information gathered from the data collection in Phase 3 into a final version of the questionnaire. This version will be used in future studies.
that are beyond the scope of the current project (see Appendix D).

Subjects

Data from subjects in all the previous phases were analyzed and synthesized in this final phase.

Results

Several issues were identified as a result of the data analysis that required further investigation. It would appear that there are still some revisions to be made with regard to clarification of the Universal Format. Subjects from group 1 in the quasi-experiment repeatedly had trouble understanding the differences in the steps of the Universal Format. Specifically, the article, Warby et al. (1997) calls for identifying the procedures and listing them in the written format. The next step is for translating the procedures into step-by-step procedures for use in the classroom. Many of the subjects felt that these two steps were duplicative.

The subjects also recommended that the order of the steps in the Universal Format be altered to make the screening of research articles flow more sequentially rather than having to move back and forth in the article in order to locate the information required by the Universal Format.
The recommendations of the expert evaluators were incorporated into the design of the instruments. They did recommend that the training module needs to be modified to be applicable to pre-service teachers. There is a need to clarify the administrative procedures to avoid the confounding of instructions for completing the research article translations. Each group should have explicit duplicate instructions from the investigator and eliminate the influence of the instructors in this process. All annotations identified were analyzed and appropriate changes were made to the final documents.

After careful examination of the data gathered from Phase 3, it was determined that a shorter version of the questionnaire would yield results that are just as useful as a longer version. The rationale was that there were too many questions that may cause the participant fatigue, and the section on research-based knowledge did not contribute information that was useful in the data analysis. Several changes were made and are detailed below.

1. The name of the questionnaire was changed to "Research Based Knowledge Questionnaire" from "Teachers' Attitudes and Beliefs on Research Based Knowledge Questionnaire". This was done so that subjects would not be biased by knowing that they
were going to be talking about their attitudes and beliefs.

2. The number of questions in the demographic questionnaire was decreased in order to reduce participant fatigue.

3. The entire section of questions on knowledge about Research Based Knowledge was deleted. The decision to delete this section was based on the belief that these questions were really beyond the scope of the questionnaire. The primary purpose of the questionnaire was to determine the participants' beliefs, informed status, and perceived benefits of research based knowledge.

4. In the subscale on beliefs, a number of questions were changed. In order to simplify and clarify the content of the questions, a number of them were reworded. Some questions were deleted based on the belief that they did not truly assess the respondents' beliefs. Additionally, several questions were added that were determined to assess additional beliefs regarding research-based knowledge.

5. Caution should be used in interpreting Benefits due to the low Alpha score reported.
6. Future field testing does appear to be warranted in order to establish the reliability and validity of the changes that were added as a result of Phase 5.
DISCUSSION AND CONCLUSIONS

The need for research-based knowledge to be in the hands of teachers has been a serious subject of discussion in education for many years. Establishing educational interventions that can demonstrate effective and efficient methods for helping students to learn has been a significant impetus for conducting research-based studies. As a result, a large body of educational research has been assembled, especially over the last 20 years, that contributes information on how the most effective learning occurs with students. A confounding problem is that with so much research available, there continues to be a barrier in getting teachers to read and incorporate research in their classroom practices.

This study was designed to present initial findings regarding the use of the Universal Format to assist teachers and educators in translating research into practice. A formative evaluation was conducted to develop
and validate a questionnaire to measure the effects of introducing the Universal Format for use by teachers and educators. This involved the initial design and subsequent development of the measurement questionnaire and the implementation of a quasi-experimental intervention using a training module incorporating the use of the Universal Format.

Five phases were implemented to complete the formative evaluation process. Phase 1 involved a determination of the needs and purpose for the questionnaire to measure the use of the Universal Format. Phase 2 involved the initial development of the measurement questionnaire. The prototype of the questionnaire was developed. Phase 3 involved implementation of a pilot test of the Universal Format with the measurement questionnaire. In addition, a training module using a quasi-experimental design was implemented with an Experimental group. Phase 3 also included error logs, and annotated materials that were collected from subjects. Research articles were translated incorporating the training received by students. A Control group also translated three research articles, but with no direction or materials from the investigator. Phase 4 subjected the questionnaire and the training module to a group of expert reviewers who performed content validation and qualitative
evaluation. Phase 5 incorporated revisions and recommendations from the data analysis.

Phase 1

The series of questions initially submitted to the group were used to select items to be used in the questionnaire. Most of the feedback included changes that were of a structural concern. Examples included confusion when marking items vs. writing the responses out, the need for explicit instructions and areas needing further clarification.

Conclusions.

Three conclusions were drawn from this phase.

1. This phase was valuable in establishing a format and the potential content for the questionnaire.

2. A series of questions could be established as a questionnaire and could be conducted within a reasonable time frame.

3. Changes in structure and content were identified through error logs and annotated materials that, if incorporated, would increase the usability of the information in a questionnaire format.
Phase 2

Once the questionnaire items were finalized, refinements were made to the item format. The purpose of phase 2 was to further refine the questionnaire for the experiment in phase 3 of this project.

It is believed that the doctoral students were familiar with the Universal Format and its intended purpose because they were present during a presentation of a preliminary review of the article that described the Universal Format. This gave them some knowledge regarding the purpose of the questionnaire. The majority of these doctoral students also had teaching experience. This rendered their feedback especially valuable in assuring that the content was relevant and related the needs and interest of the intended participants.

Conclusion

The incorporation of feedback from the doctoral students improved the potential of this questionnaire becoming an effective tool for measuring the use of the Universal Format. For example, their feedback included concerns about section 5 (Professional Development Management) in the questionnaire. The questions here addressed the need for professional development. After considering the feedback from the doctoral students, it was
decided that this section was not directly related to the concerns of this study and the decision to drop this section was made. Many other items were noted that included grammatical corrections, clarifying instructions, and format considerations. The modifications allowed for the development of a draft that could be used in a quasi-experiment to further validate its use.

Phase 3

Phase 3 provided the major contribution to this study by conducting a quasi-experiment using the Universal Format. The questionnaire was used as a pre- and post-test measurement concerning change in benefits, informed status, and beliefs of the participants. A training module was developed and implemented with subjects incorporating the rationale and procedures developed in the Universal Format.

Questionnaire Scores

Scores indicated that the Control group experienced significant differences between pre- to post-test regarding the number of benefits. It may be that having learned the rationale for research-based knowledge as a result of the course curriculum (math strategies), increased the perception of the subjects regarding the benefits of using research in their classrooms.
The fact that a significant positive change occurred with the Control group between pre- and post-test regarding the control participant's perceptions of how well informed they believed they were provides evidence that reading research-based information increases perception of how well informed subjects believe they are about research. The questions that made up this variable were related to more general issues regarding research and research articles. It may be that the mere process of having to read and analyze three research articles had a positive effect on participants in this area. Again, the content of the course had a research orientation because of the math topic and the orientation of the instructor. By contrast, the university course for the Experimental group, while having a solid research foundation, did not emphasize research in the presentation of the curriculum to these students.

The Control group also indicated a significant positive difference from pre- to post-test on belief scores. Scores decreased indicating a significant improvement in their perceived beliefs about the use of research-based knowledge. The process of analyzing a research article may increase the probability that participants will have increased positive beliefs about research-based knowledge. Additionally, students who
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notion that the training provided to this group enhanced teachers’ beliefs regarding the use of research-based knowledge in the classroom.

**Article Translation Scores**

Results indicated that the Experimental group had a significantly higher rating in their interpretation of the research articles. This may indicate that the intervention better prepared the Experimental group participants to evaluate the research articles. The lack of specific training or structure concerning the translation of the research articles may account for the lack of improvement across the three articles.

**Conclusions**

1. Use of the questionnaire to measure the participants' perceptions about the benefits of research indicated significant improvement from pre- to post-test for both groups. This may be an indication that the process of reading and interpreting research in educational coursework may have a positive effect on students' perception, understanding, and comprehension of research-based practices.

2. Use of the questionnaire to measure the participants' informed status about research indicated significant improvement from pre- to post-test for both groups.
This may, again, be an indication that the process of reading and interpreting research in educational coursework may have a positive effect on students' perception, understanding, and comprehension of research-based practices.

3. Use of the questionnaire to measure the participants' beliefs regarding research-based knowledge indicated significant improvement from pre- to post-test for both groups with the greater increase going to the Control group. Again, the process of reading and interpreting research may have a positive effect on the perceptions about the value of research as a useful tool for classroom application.

4. Use of the Universal Format with the Experimental group resulted in significantly higher scores for each successive article translation in their ability to translate the research. The process of training students in the use of the universal format with successive feedback may have improved students' ability to read and translate the research into a practical application for the classroom.

5. The Control group experienced a lower rating in their ability to translate research and results for article 3 comparisons indicate that the experimental group had
higher scores. This indicates that the training module did make a difference. The lack of a format or process for translating research-based information into practical applications may result in a failure to act upon the information in a way that creates new knowledge as a result of considering the information in the context of a classroom application.

Phase 4

Concurrent with phase 3, the questionnaire and the training module were subjected to expert analysis to further improve the content and structure of the questionnaire for the eventual purpose of completing a pilot test on a representative sample. The feedback that was received was incorporated where structural and grammatical errors were noted. When recommendations for changes in content reasonably could be included with this study, they were also included in the final drafts for the questionnaire and the training module. Significant changes were made to both the questionnaire and the training module as a result of this feedback.

Conclusion

It was the consensus of the expert evaluators that with specified changes, the content and structure of the
questionnaire and the training module had merit. It was indicated that the study results should be used to continue to further investigate the benefits of using the Universal Format to assist teachers and educators.

Phase 5

Phase 5 involved restructuring the questionnaire a final time based on results from Phase 3 (see Appendix D). Conclusions based on these changes are not possible until another quasi-experiment is run using the training module and the current version of the questionnaire.

The results and conclusions from all phases seem to indicate that the use of the questionnaire along with the training module could be an effective method to implement and measure the effects of the Universal Format. However, given that no group differences were identified regarding Benefits, Informed Status and Beliefs, caution should be used in generalizing the beneficial effects at this time. Further studies are warranted in order to rule out the confounding conditions that are discussed in the limitations below. The minimal time that was involved in the presentation of the training module appears to indicate that this could be an effective method for assisting
teachers and educators in locating, interpreting and translating research into practice.

The questionnaire could be used to assess student knowledge about the benefits, informed knowledge, and beliefs concerning the use of research-based knowledge, to determine the need for instruction. Given the positive results from the Experimental group, it would appear that further investigation of the use of the measurement questionnaire and the training module regarding the Universal Format is warranted.

Limitations

The following limitations from McMillan & Schumacher (1993) were identified in this study.

1. **History.** In the quasi-experimental phase, the use of different groups across three different graduate courses could affect the results across points in time given that the same conditions e.g., curriculum taught for in each classroom.

2. **Selection.** The non-random selection of subjects was another limitation; however, repeated measures analyses were performed as a partial effort to control for this problem. Volunteer
subjects could affect the results given that motivation to participate could confound results.

3. **Pre-testing.** The utilization of the questionnaire as a pre-test may have provided subjects with information leading them to assume the intended purpose of the study. It is possible that their responses were bias in some manner as a result.

4. **Subject Attrition.** Several subjects in group 2 dropped out after taking the pre-test questionnaire. This resulted in uneven group numbers and created a very small sample size for group 2 (N=10).

5. **Experimenter Effects.** Materials delivered in the training module were still somewhat formative during the time they were administered. This makes the delivery and content subjective with respect to teacher knowledge, experience, and personality. The final draft of the training module as a result of incorporating the expert feedback was not validated with the subjects in this study. Differential treatment could have confounded effects in this study given that each group had a different instructor.
6. **Treatment Replications.** In the quasi-experiment, the treatments were not replicated and were only conducted once.

7. **Population External Validity.** The use of college students as subjects limits generalizability to teachers who are not attending university courses. Thus, the findings may be limited to the characteristics of the Experimental group in particular.

8. **Construct Validity.** Given the complexity of the nature of research and its effect on practice in education, the adequacy in which it was communicated and understood in this study could make replication of the training module difficult.

9. **Group Attrition.** One of the Experimental groups was dropped from final analyses due to a small sample size and large amounts of missing data. It may be that the intervention that this group received could have significantly affected the results had there been a large enough sample size. Future research will need to examine the effects of having subjects read the Warby et al., (in press) article without specific instruction.
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to develop more user friendly formats for understanding and using research.

Recommendations for Further Study

Formative evaluation is a process used to modify or revise a product in a developmental stage. This study has provided the initial steps of this process by the design and initial review of an instrument to measure the effects of using the Universal Format to translate research. The gap between research and practice in education has important implications for the future of the quality of the education provided to our Nation's youth.

The importance of teachers using research as a foundation for practice has been well established. The literature regarding methods for assisting teachers in locating, reading, and incorporating research-based knowledge into classroom practice consists mostly of opinion-based information. Because there is so little empirical evidence of how to get research into the hands of teachers some areas suggested for further research include:

1. An extension of this study to be conducted with a representative sample of subjects in order to validate techniques and refine the methods provided in the Universal Format.
2. Sample selection in further studies needs to take into account the complexity of the educational backgrounds of the participants. Whether or not participants have taken previous coursework related specifically to research or at what stage they are in their education. The type of coursework they are enrolled in during the study, as well as the orientation of the instructor's should be taken into account.

3. Further refinement of the measurement questionnaire used in this study needs to be conducted to assure that it adequately measures those areas that are related to improved performance outcomes through the use of research-based knowledge in classrooms. Additionally, efforts will be made to change the questions in the benefits subscale of the questionnaire in an effort to increase the internal consistency.

4. The training module needs to be modified to assure that it adequately addresses the instructional needs of pre-service teachers as well as in-service teachers. Perhaps a videotape presentation would enhance the consistency and
generalizability to other settings and participants.

5. Additional research is needed to identify methods in teacher education curricula that assure an adequate understanding of how to locate, read, and interpret research. Research is needed to determine methods to get people who provide teacher education to use research-based knowledge as a teaching foundation.

6. Longitudinal studies are needed to examine the impact of teacher use of research-based knowledge once they have received guidance and training in this area. Is there long term evidence that this knowledge and skill is evident in the teacher’s practices in the classroom?

7. Further longitudinal studies are needed to examine actual student performance outcomes related to changes in teacher research-knowledge based skills. In order to validate the use of research-based knowledge in classrooms, student performance must measured to better understand the impact of the teacher’s knowledge basis.

8. Research concerning the knowledge, belief and concern of researchers toward the use of
research-based knowledge by educators needs to be conducted to determine those areas that will improve collaboration between researchers and educators. Much of the research to practice gap could be addressed through the establishment of cooperative meditation between teachers and researchers.

This study presented a method for measuring the effects of the use of the Universal Format by university students. The Universal Format was designed to assist teachers and educators in locating, reading and interpreting research. The method verified that teachers could improve the quality of their article translations as demonstrated by the improved scores of the Experimental Group over the Control Group. Adding the training module provided in this study that was developed from the procedures used with the Universal Format can enhance the translation of research articles.

There is a need for additional research in education to identify student performance outcomes as a result of teachers' improved abilities in using research-based knowledge. To apply research, teachers must be able to read, understand, and interpret research. To assure these skills are present, teachers need to be provided with
instruction, and methods that have been empirically shown to accomplish this task.
APPENDIX A

Universal Format
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Title</td>
<td>The title is a key indicator of article's content.</td>
</tr>
<tr>
<td>2. Abstract</td>
<td>The purpose and outcomes are identified in this short summary.</td>
</tr>
<tr>
<td>3. Evidence of Research</td>
<td>Look for some evidence of data collection and focus on key words (e.g., models, interventions, methods, strategies, or comparisons).</td>
</tr>
<tr>
<td>4. Method</td>
<td>Look for the sampling procedures (e.g., criteria for and selection of participants), data-collection procedures that identify questionnaires (e.g., questionnaires, test) and steps to follow in collecting the data. This will assist the reader in evaluating the appropriateness, reliability, and validity of the results of the research and in eliminating material that is not</td>
</tr>
</tbody>
</table>
empirical in nature.

<table>
<thead>
<tr>
<th>5. Identify the Consumers</th>
<th>Here the students who participated in the research are identified. It is important to ascertain the similarities and/or differences between these students and the target population in the teacher's own classroom. The following will be indicated: (a) sample population that was used, (b) age of the participants, (c) disabilities, and (d) selection used.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Modifications</td>
<td>Identify any modifications needed to adapt this research to the identified classroom or individual student. It is here that the translated research from the &quot;interpret the finding&quot; section is modified for specific classrooms or students. It is possible that no modifications are necessary.</td>
</tr>
</tbody>
</table>
7. Reference

This provides back-up documentation of the research article used. It may be necessary to revisit the research at a later date, so be sure to record the name of the author(s), the date published, title of the article, the journal, the volume number of the journal, and the page numbers.
APPENDIX B

Blueprint for Pre/Post-test Questionnaire
### PRE/POST-TEST QUESTIONNAIRE BLUEPRINT

<table>
<thead>
<tr>
<th>Information Category</th>
<th>Item</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher characteristics...</td>
<td>1-11</td>
<td>All</td>
</tr>
<tr>
<td>Research in the classroom for practicing teachers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School support to use RBK*</td>
<td>12</td>
<td>Teacher</td>
</tr>
<tr>
<td>School encouragement to access RBK</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>RBK</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>RBK Instructional Practices</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Knowledge of Research-based materials</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Importance of RBK in classroom instruction</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Problems using RBK in the classroom</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Beliefs about using RBK in the classroom</td>
<td></td>
<td>Teacher</td>
</tr>
<tr>
<td>Beliefs about specific benefits of RBK</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Beliefs about how well informed you are about RBK</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Beliefs about the Benefits of RBK to teaching</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Beliefs about the Benefits of RBK to field of education</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Attitudes and Beliefs about RBK</td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>Research coursework completed</td>
<td>23-50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51-53</td>
<td></td>
</tr>
</tbody>
</table>

*RBK: Research-based knowledge*
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<table>
<thead>
<tr>
<th>Comments</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Question concerning item's 21 and 22 (depends on...)</td>
<td>Question concerning item 7, misplaced statement.</td>
</tr>
<tr>
<td>Need to highlight the instructions regarding the definition of research-based knowledge (RBK).</td>
<td>Confusion regarding Professional development Section instructions</td>
</tr>
<tr>
<td>Section I needs clarification regarding special education schools and self contained classrooms. ...</td>
<td>Concerns over items that do not apply to teachers who are not or do not practice in classrooms.</td>
</tr>
<tr>
<td>Mistake in item 25 (repeated sequence)</td>
<td>Item 26 has word use error (your instead of you).</td>
</tr>
<tr>
<td>Item 12 needs extra boxes for 4th rating on scale</td>
<td>Concern about the document being too long.</td>
</tr>
<tr>
<td>Item 12 missing (a) in sequence.</td>
<td>Clarification regarding early childhood for section 1.</td>
</tr>
<tr>
<td>Need to be more specific in item 11</td>
<td>RBK is too confusing. What does it entail?</td>
</tr>
<tr>
<td>Item 16 needs added a somewhat category</td>
<td>Item 12 needs to add further categories rather than just yes, no.</td>
</tr>
</tbody>
</table>

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| Comment: Look for the bugs. | Needs more proofing. |
APPENDIX D

Teachers' Attitudes and Beliefs Toward Research Based Knowledge Questionnaire

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SAMPLE FROM PHASE 3

INSTRUCTIONS:

1. Read the instructions for each section and answer each question even if you are not sure.

2. Please note the instructions in each section for non-teachers and practicing teachers prior to completing that section.

3. Read the box regarding the definition of research based knowledge. The acronym, RBK is used extensively throughout the survey.

4. If you are not sure how to answer, check the one that seems the most appropriate and make a note in the margin.

5. Please write your name on the survey. The course instructor will delete your name and replace it with a control number to protect the confidentiality for research purposes.

IMPORTANT: PLEASE NOTE.

Because this questionnaire is a prototype, we are requesting your assistance to make improvements. As you respond to this questionnaire, please:

   (a) circle any words or phrases that you do not understand, in the margin, write EX when you believe one or more examples would help you better understand what has just been stated. Writing a brief suggestion of a good example in the margin will also be most helpful, and
(b) put a question mark? In the margin next to anything that is not clear to you.

(c) Making a note in the margin telling specifically what needs to be cleared up will help.

SECTION I: BACKGROUND INFORMATION

1. If currently teaching, in what kind of communities do you now teach? (Skip to #2 if not teaching) (Check ONE.)

   1 □ Urban
   2 □ Suburban
   3 □ Rural

2. At what level do you teach or plan to teach? (Check all that apply.)

   1 □ General Elementary
   2 □ Regular Middle school
   3 □ Regular High School

3. If currently teaching or plan to teach in Special Education, what are the ages and class types?

   1 □ resource age_____
   2 □ c.c. model age_____
   3 □ self-contained age_____
   4 □ special school age_____

4. What is the disability that the majority of your students have or that you plan to teach?

   ____________________________

5. If currently teaching, please indicate how many students you teach. _____
6. Please check below the number of the highest degree you have completed, and indicate the year in which you received it.
   1 □ Bachelors degree: 19__
   2 □ Masters degree: 19__
   3 □ Ed. Specialist degree: 19__
   4 □ Doctoral degree: 19__
   5 □ No degree
   6 □ Other

7. University/College, additional credits past last degree ____

8. Please indicate below the number of years of full-time teaching experience if any, you have completed. Include the current year. _______

9. Which one of the following describes you best?
   1 □ American Indian or Alaskan Native
   2 □ Asian or Pacific Islander
   3 □ African American
   4 □ Hispanic
   5 □ Caucasian
   6 □ Other, describe__________________________

10. What is your gender? Male □ Female □

11. Please indicate your age. Age ____________

PLEASE READ PRIOR TO ANSWERING THE FOLLOWING QUESTIONS ABOUT RESEARCH-BASED KNOWLEDGE.

SECTION II. (For practicing teachers only.) RESEARCH IN THE CLASSROOM (If not practicing teacher, skip to section III)

12. Does your school encourage the use of RBK (as described above) used to identify instructional methodology in your school? (Check one)
   1 □ yes
   2 □ no
   3 □ do not know

A note on terminology: On the following pages we consistently use the term RESEARCH-BASED KNOWLEDGE (RBK). Research-based knowledge has been described as information derived from "systematic and sustained inquiry, planned and self critical, subject to public criticism and to empirical tests" (Ruddock and Hopkins 1979, p. 18). The information is typically located in scholarly publications and has undergone the rigorous requirements of research principles.
13. Does your school system encourage you to access RBK regarding the best instructional practices to use in your classroom teaching (see examples below)?

If yes, please check all that apply in “a” through “f.”

If no, please go to “g.”

a. Materials and information concerning RBK are readily made available to you.

b. You receive training from consultants or specialists in the application of RBK.

c. Conferences and workshops are provided to you by the school regarding RBK.

d. You are provided with release time to conduct research on topics that embody RBK.

e. You receive release time to attend University/College courses that embody RBK.

f. You acquire RBK from informal sharing with colleagues in your school.

If no, please check the most appropriate answer below:

g. You search the literature for RBK on your own time.

h. You do not access RBK.

14. Do the instructional practices you use in the classroom come from RBK? Yes □ No □

Yes GO ON TO Q. 15
No SKIP TO Q. 16

15. Of the RBK you use in your classroom, do you know: (please check yes or no for each one.)

   a. The primary author(s) of the research... Yes □ No □
   b. The year the research was published... Yes □ No □
   c. The source of publication..................Yes □ No □
   d. The statistical design of the research... Yes □ No □
   e. The sample used in the research........ Yes □ No □
   f. The setting for the research............ Yes □ No □
   g. The results and conclusions............... Yes □ No □

16. Do you subscribe to any academic journals that offer research-based information........... Yes □ No □

Please provide name(s):
17. How important do you think research-based instructional practice is as a foundation for your classroom instruction?
   None ☐ somewhat ☐ very much ☐ critical ☐

18. What are your problems if any, in using RBK in your classroom? (Check all that apply)

1 ☐ Locating and accessing research.
2 ☐ Lack the time.
3 ☐ Concerns about the credibility of research.
4 ☐ Lack opportunities to examine the pros and cons of research findings with colleagues.
5 ☐ Researchers don’t use topics related to day-to-day classroom needs.
6 ☐ Research writing is unintelligible and irrelevant to their daily concerns.
7 ☐ Research reports are cumbersome and complicated by statistical data and research terminology.
8 ☐ I lack the skills for understanding in interpreting research.
9 ☐ Research findings are imposed on teachers. by administrators and limit teachers’ autonomy?

19. Do you think educational research benefits your teaching? Yes ☐ No ☐

20. Do you think educational research benefits the field of education? Yes ☐ No ☐

SECTION III. RESEARCH BASED KNOWLEDGE (for all respondents)

21. What are the benefits to using RBK? (check all that apply):

1 ☐ Improved classroom performance
2 ☐ Standardized achievement goals
3 ☐ Save time by avoiding trial and error
4 ☐ Provides support for the type of instruction used in the classroom
5 □ Offers solid evidence regarding reliability and validity of the results
6 □ Other, describe____________________

Please answer each of the following by checking one answer, and use this scale:
1 = Very well informed 3 = Somewhat informed
2 = Fairly well informed 4 = Not well informed

22. How well informed are you about the following?
   a. The influence RBK has on the practice of education
   b. Components of well-designed research
   c. Conducting research
   d. Finding and locating research
   e. Interpreting research
   f. Translating research into classroom practice

SECTION IV: ATTITUDES AND BELIEFS ABOUT RBK. (For all respondents)

Below, is a series of sentences. Please check the degree to which you agree or disagree with the sentence. There are no right or incorrect answers. Your responses reflect your attitudes and beliefs. Do not spend too much time on any one statement.

Please use the following scale:
A (strongly agree), B (agree), C (unsure), D (disagree), and E (strongly disagree)

23. I look forward to coursework in educational research. ___________________________
25. RBK should always be used as a foundation for educating teachers. ___________
26. RBK consists of knowledge derived from empirical evidence ____________________
27. To understand RBK, teachers must understand statistical analysis. ___________
29. Teachers' should have opportunities to practice reading and interpret research to better understand its meaning.  

30. The overall conclusion of a research article is more important than having a correct understanding of each of the components that make up the study.  

31. Teachers should be given school time to think about what they have learned through using RBK.  

32. The primary reason for reading research is to become a better teacher.  

33. I like research.  

34. Research in education is a constantly expanding field.  

35. I enjoy learning how to use research to enhance teaching practices.  

36. I use of research as a primary aid for understanding how to solve problems that occur in classroom instruction.  

37. I expect that college courses taken involving RBK will be helpful to me in teaching students in the classroom.  

38. I want to learn how to use research as a tool for enhancing my teaching abilities.  

39. Reading and understanding research scares me.  

40. I feel prepared to read and understand research in order to apply it in the classroom.  

41. Knowledge of research is useful to my job.  

42. I need to know research methodology in order to apply the research in real life settings.  

43. I'm confident in my research translation skills.  

44. I understand the basic principles of hypothesis testing and statistical inference.  

45. A sound methodology is essential for quality research.
46. I see the usefulness of research methodology in my professional life.  

47. I am confident in working with statistics.  

48. I have a thorough understanding of research methods.  

49. I understand the basic principles of classical test theory.  

50. A good teacher must have a strong background in research methodology.  

51. I have taken educational research coursework at a University/College? Yes ☐  No ☐  
If the answer to #51 is yes, please complete # 52 & 53.  

52. Please describe what type of courses were taken:  

52. The coursework and training I have taken regarding educational research has been useful in helping me to understand and use RBK.  

THANK YOU FOR YOUR FEEDBACK AND TIME TO COMPLETE THIS QUESTIONNAIRE.
PLEASE TAKE A MOMENT TO RESPOND TO THE FOLLOWING QUESTIONS

Please complete each of the following in a sentence or two as you reflect on the questionnaire that you just completed:

1. I wonder....

2. I am surprised...

3. I wish....

4. I think....

5. I suggest....because
INSTRUCTIONS:

1. Read the instructions for each section.

2. If you are not sure how to answer, check the one that seems the most appropriate and make a note in the margin.

3. The acronym, RBK is used extensively throughout the survey to indicate research-based knowledge. (IMPORTANT) Please read the following notation:

Research-based knowledge (RBK) defined:

- Research is a planned and systematic method of collecting and analyzing data in order to solve a problem or to answer a question. Research-based knowledge is the information derived from the research. This information is typically located in scholarly publications and has undergone the rigorous requirements of research-based methodology.

- Ruddock and Hopkins, 1979 (p. 18), have described research-based knowledge as information derived from "systematic and sustained inquiry, planned and self critical, subject to public criticism and to empirical tests.

SECTION I

BACKGROUND INFORMATION

1. What is your sex? Male [ ] Female [x]

2. Please indicate your age. Age ________
3. Which one of the following describes you best?

1 ☐ Native American
2 ☐ Asian or Pacific Islander
3 ☐ African American
4 ☐ Hispanic/Latino
5 ☐ Caucasian
6 ☐ Biracial
7 ☐ Multiracial
8 ☐ Other, describe____________________

4. Please check below the number of the highest degree you have completed, and indicate the year in which you received it.

1 ☐ Bachelors degree: 19__
2 ☐ Masters degree: 19__
3 ☐ Ed. Specialist degree: 19__
4 ☐ Doctoral degree: 19__
5 ☐ No degree
6 ☐ Other (Specify: ______________ )

5. Are you currently teaching? Yes ☐ No ☐

If no, skip to Section 2.

6. In what kind of community do you now teach? (Check ONE.)

1 ☐ Urban
2 ☐ Suburban
3 ☐ Rural
4 ☐ Not currently teaching

7. At what level do you teach? (Check ONE.)

1 ☐ General Elementary
2 ☐ Regular Middle school
3 ☐ Regular High School

8. Please indicate below the number of years of full-time teaching experience, you have completed. Include the current year. ______
SECTION II. (All respondents)

1. What are the benefits to using RBK? (Check all that apply):

- [ ] Improved classroom performance
- [ ] Standardized achievement goals
- [ ] Save time by avoiding trial and error
- [ ] Provides support for the type of instruction used in the classroom
- [ ] Offers solid evidence regarding reliability and validity of the results

Please answer the following questions based on the scale:
1 = Very informed
2 = Somewhat informed
3 = Not too informed
4 = Not at all informed

2. How well informed are you about the following?
   1. The influence RBK has on the practice of education
   2. Components of well-designed research
   3. Conducting research
   4. Locating research
   5. Interpreting research
   6. Translating research into classroom practice

SECTION III:
(For all respondents)

Below is a series of sentences. Please check the degree to which you agree or disagree with the sentence. There are no correct answers. Your responses reflect your attitudes and beliefs. Do not spend too much time on any one statement.
Please use the following scale:

A (strongly agree), B (agree), C (unsure), D (disagree), and E (strongly disagree)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I look forward to coursework in educational research.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I enjoy learning how to use research-based information.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>3. RBK should always be used as a foundation for educating teachers.</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. RBK consists of knowledge derived from empirical evidence.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Knowledge of research is not useful to my job.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>6. To understand RBK, teachers must understand statistical analysis.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>7. Teachers should have opportunities to practice reading and interpreting research to better understand its meaning.</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. The overall conclusion of a research article is more important than having a correct understanding of each of the components that make up the study.</td>
<td>1</td>
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<tr>
<td>9. Teachers should be given school time to think about what they have learned through using RBK.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I do not feel prepared to read and understand research in order to apply it in the classroom.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. The primary reason for reading research is to become a better teacher.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I like reading or doing research.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. Research in education is a constantly expanding field.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>14. I don't enjoy learning about RBK.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>15. I use research as a primary aid for understanding how to solve problems that occur in my classroom instruction.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>16. I enjoy learning how to use research to enhance teaching practices.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>17. I expect that college courses involving RBK will be helpful to me in teaching students in the classroom.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. I want to learn how to use research as a tool for enhancing my teaching abilities.</td>
<td>1</td>
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<tr>
<td>19. I have no fear about Reading and interpreting research.</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. I feel prepared to read and understand research in order to apply it in the classroom.</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. I am confident in reading and understanding statistics.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>22. I need to know research methodology in order to apply the research in real life settings. I'm confident in my research translation skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. I understand the basic principles of hypothesis testing and statistical inference.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. A sound methodology is essential for quality research.</td>
<td>1</td>
<td>2</td>
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</tr>
<tr>
<td>25. I see the usefulness of research methodology in my professional life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>26. I have fear regarding reading and interpreting research.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tr>
<tr>
<td>27. Knowledge of research is useful to my job.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>28. I have a thorough understanding of research methods.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>29. I understand the basic principles of classical test theory.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>30. A good</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
teacher must have
a strong
background in
research
methodology.

<table>
<thead>
<tr>
<th>31. I do not look forward to coursework in educational research.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>32. The coursework and training I have taken regarding educational research has been useful in helping me to understand and use RBK.</th>
<th>1</th>
<th>2</th>
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<th>5</th>
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</thead>
</table>
APPENDIX E

Statement of Informed Consent
The following information is presented in order to aid respondents in understanding the purpose of this questionnaire and its related materials as a research project at University of Nevada, Las Vegas.

The principal investigator, Dale B. Warby is a doctoral candidate in the Special Education Department at the University of Nevada, Las Vegas and as such is requesting your participation as part of a research project. The purpose of the research is to evaluate materials intended to assist educators in translating research into practice. The duration of the research data collection is for one semester, commencing January 1998, and concluding May 1998. The intent of the research is to design methodology that enhances an educator's ability to identify, locate, and translate primary research into practical applications for use in classrooms. It is understood by the respondent in agreeing to this consent that no compensation is offered for this data. The respondent also understands that complete anonymity will be maintained and that the course instructor(s) will assure that all records are completely confidential.
If you have any questions regarding this research please contact the UNLV Department of Special Education at 895-3205. If you have questions about your rights as a respondent, you can contact the UNLV Office of Sponsored Programs at 895-1357. All participation is voluntary and respondents may withdraw from participation at any time. We appreciate your consideration of participation in this research project and are confident that the results of this research project will be beneficial to the vast majority of educators.

Thank you for your time and attention to this request.
APPENDIX F

Training Module
Training Module (Draft Version 3)

Session One: Introduction to Research-to-Practice (45 minutes)

Purpose: Discuss and explain research-based knowledge, the historical developments and the universal format for translating research into practice.

Objectives:

• How Is Knowledge Acquired by Teachers?
• What Is Research Based Knowledge?
• How Does Research Contribute to Education?
• Viewpoints and Concerns From Educators and Researchers
• Review of Existing Models
• Universal Format for Translating Research
• Demonstration
• Conclusion
"I never liked reading research. It is too boring."

I cannot understand research articles. After all, I am just a primary teacher."

I get confused when I read anything to do with statistics.

I never liked math."

1. Introduction/Overview

"Over the past 50 years there have been periodic attempts to see if educators read the professional literature. In almost all cases, the findings have indicated that they generally don't" (Erion & Steinley, 1994, p. 11).

2. Rationale for utilizing research in the classroom.
   • Increasing diversity in the classroom creates a need for educators to be directly responsible for and capable of implementing research-based interventions that meet the needs of their students.

3. What is research-based knowledge?
   • Research-based knowledge can contribute meaningfully to the enhancement of the skills and professional knowledge of all educators (Jaquez, 1989).
   • Research-based knowledge has been described as information derived from "systematic and sustained inquiry, planned and self critical, subject to public criticism and to empirical tests (Ruddock and Hopkins 1979, p. 18).
   • This information is typically located in scholarly publications and has undergone the rigorous requirements of research principles.
4. How does research contribute to education?

Four Types of Knowledge That Research Contributes to Education:

- **Description**: Involves the description of natural or social phenomena; their form, structure, activity, changes over time, in relationship to other phenomena. For example, astronomers have used their telescopes to develop descriptions of different parts of the universe.

- **Prediction**: Involves the ability to predict a phenomenon that will occur at time Y from information available at an earlier time X. In education, test like the Scholastic Aptitude Test identify students who are likely to be unsuccessful as their education progresses so that prevention programs can be instituted (e.g., academic or career success).

- **Improvement**: Concerns the effectiveness of interventions. Examples of interventions in different professions are drug therapies in medicine, construction materials in engineering, marketing strategies in business, and instructional programs in education (Handout # 1: Effects Of Instructional Factors On Student Learning Outcomes).

- **Explanation**: Involves the rationale that if researchers are able to explain an educational phenomenon, it means that they can describe it, can predict its consequences, and know how to intervene to change those consequences. Researchers ideally frame their explanations as theories: An explanation of a certain set of observed phenomena in terms of a system of constructs and laws that relate these constructs to each other (for example, Jean Piaget’s theory of intellectual development).” (Gall, Borg & Gall, 1996, p.4-9).
Categories of concerns from educators.

- Concern with the credibility of the research (the methodology, sample used, and conclusions drawn etc.)
- Research too unwieldy and complex
- Are unfamiliar with the prose conventions (e.g., meta-analysis, anova or test of homogeneity etc.) of research
- Lack opportunities to discuss and digest the pros and cons
- Inability to gain access to research
- Lack the time to delve into libraries in search of articles
- Feel that they hold a lower status than researchers

Educators and researchers often have similar goals but may have different roles, values, and perspectives in regard to the use of research in the classroom. These roles expose them to different pressures and create differing paradigms.

Educators may respect and value the findings of educational researchers but they are dissatisfied with the scope and jargon of research-based information (Jaquez, 1989).

Several researchers have identified a number of concerns between researchers and educators (Carnine, 1997; Kauffman, 1996; Livingston & Castle, 1989; Lovitt & Higgins, 1996).
7. Categories of concern from researchers

- educators use information from resources that typically have not been tested and verified by research
- research-based knowledge may not curb unsubstantiated methods of teaching
- educators fail to pay close attention to the research assumptions which may result in ineffective utilization
- research that is designed to be basic or pure may not satisfy the educator's need for practical application since its primary focus is on discovery of knowledge for purposes of formulating a theory.
- producers who assemble packaged programs for educators may overlook important research findings in lieu of pursuing popular innovations that are in vogue and have no empirical substantiation

8. Review of Existing Models

Three types of models have been developed to address the issue of how to get research into the hands of educators and practitioners. The three types of models are:

- step-by-step models
- system reform models
- teachers change models

None of these models directly identified steps to translate research into practice for educators in the classroom, or presented a comprehensive format that could be used by educators to interpret research.

Universal Format for Translating Research

Variables such as time, effort, and access can be barriers to the process of translating research to practice. These barriers, however, should not discourage educators from using research. It is important for educators to use research to enhance their teaching practices. The Universal Format provides a simple, practical, and timesaving method
for translating research into practice to meet the specific needs of individual students.

Locating and accessing research
- Locating research-based information
- Evaluating the parts of a research report

Session Two: Translating Research into Practice (60 minutes)

Purpose: Discuss and explain the rationale and use of the universal format for translating research into practice.

1. Overview of the Universal Format and its Development

2. Components of the universal format

- **Title**
  
The reader should identify the title. It is a key indicator of the article's content.

- **Abstract**
  
The reader gets a quick look at the entire study in this short exert. The abstract is at the beginning of a research article and gives a summary of the research study.

- **Evidence of Research**
  
The reader should look for some evidence of data collection and focus on key words (e.g., design, methodology, results, or comparisons).
• **Methodology**

In this section, the reader should look for the sampling procedures (e.g., criteria for and selection of participants), data-collection procedures that identify instruments (e.g., questionnaires, test, etc.) and steps to follow in collecting the data. This will assist the reader in evaluating the appropriateness, reliability, and validity of the results of the research and in eliminating material that is not empirical in nature.

• **Identify the Consumers**

Here the subjects who participated in the research are identified. This is important to ascertain the similarities and/or differences between these subjects and the target population in the classroom. The following will be indicated: (a) sample population that was used, (b) age, or grade of the participants, (c) disabilities, and (d) selection process of student participants.

• **Concluding Statements**

Identify any limitations (e.g., sample or settings) in the study. Write a short overview of your findings.

• **Interpret the Findings**

Here the reader translates the research into a step-by-step classroom procedure. The intervention is broken down into its sequential components so that it may be applied in the educational setting exactly as the researcher applied it in the research setting. This is the translation of the research not a modification of
the research. The reader should translate what needs to be done.

- **Procedures**

  Write out the procedures used. If possible, interpret into discreet behavioral terminology to develop clear measurable objectives for the purposes of classroom application.

- **Modifications**

  Identify any modifications needed to adapt this research to the identified classroom or individual student. It is here that the translated research from the "interpret the finding" section is modified for specific classrooms or students. It is possible that no modifications will be necessary.

- **Reference**

  This provides back-up documentation of the research article used. It may be necessary to revisit the research at a later date, so be sure to record the name of the author(s), the date published, title of the article, the journal, the volume number of the journal, and the page numbers.

*Session Three: Demonstrations and Feedback (Three 30-minute sessions)*

Purpose: To demonstrate the use of the universal format and provide feedback to participants regarding sample article translations.
1. Demonstrations

5. Subjects are given sample translations included in the publication *Research to Practice: Suggestions for Educators*.

6. Each student is required to translate using the universal format, two pre-determined research-based articles.

7. A third empirically based research article is to be selected from the student’s choice and translated into a classroom intervention.

8. The instructor provides individual instruction in the use of the library as a source of materials for this article.

2. Feedback

Feedback is given after each article translation and prior to the next by the instructor.

*Session Four: Final Discussion and Conclusions (30 minutes)*

Purpose: To summarize and discuss participants continued use of the universal format in their teaching practices.

1. Conclusion

Points for educators to keep in mind as they begin to translate research-based knowledge into practice:

- Translating research into practice is useful to educators.

- Increasing diversity in the classroom creates a need for educators to be directly responsible for and capable of implementing research-based
interventions that meet the needs of their students.

- Educators who use research become active inquirers in their efforts to utilize research into classroom practice.

- Becoming active consumers of research requires strategies that educators can use to find and translate the research.

- The ability to access and interpret directly from primary (author(s) of the research) sources of educational research empowers the educator.

Conclusion
APPENDIX G

Instructions for the Translation of Three Research Articles for the Control Group by the Instructor.
The instructions were:

Each student will complete three research critiques.

Article 1: (then I gave them the APA reference for the Wilson et al. article)

Article 2: (then I gave them the APA reference for the Jitendra & Hoff article)

Article 3: Your choice of a research article that discusses an experimental study. (I told them it had to relate to math)

The following format should be used when typing these critiques.

(Remember to paraphrase the authors' words.)

*Purpose of study

*Subjects

*Setting

*Procedures

*Results/Findings

*Discussion (Assume you are a teacher and discuss how you could apply this research in a classroom setting.)

This was on their syllabus and I went over it verbally. I also told them the point values for each article. Articles 1 and 2 were worth 16 points. Article 3 was worth 18 points.
APPENDIX H

Questions Regarding Beliefs Concerning

Research-Based Knowledge
1. I look forward to coursework in educational research.
2. I enjoy learning how to use research-based information.
3. RBK should always be used as a foundation for educating teachers.
4. RBK consists of knowledge derived from empirical evidence.
5. Knowledge of research is not useful to my job.
6. To understand RBK, teachers must understand statistical analysis.
7. Teachers should have opportunities to practice reading and interpreting research to better understand its meaning.
8. The overall conclusion of a research article is more important than having a correct understanding of each of the components that make up the study.
9. Teachers should be given school time to think about what they have learned through using RBK.
10. I do not feel prepared to read and understand research in order to apply it in the classroom.
11. The primary reason for reading research is to become a better teacher.
12. I like reading or doing research.
13. Research in education is a constantly expanding field.
14. I don’t enjoy learning about RBK.
15. I use research as a primary aid for understanding how to solve problems that occur in my classroom instruction.
16. I enjoy learning how to use research to enhance teaching practices.
17. I expect that college courses involving RBK will be helpful to me in teaching students in the classroom.
18. I want to learn how to use research as a tool for enhancing my teaching abilities.
19. I have no fear about Reading and interpreting research.
20. I feel prepared to read and understand research in order to apply it in the classroom.
21. I am confident in reading and understanding statistics.
22. I need to know research methodology in order to apply the research in real life settings.
23. I’m confident in my research translation skills.
24. I understand the basic principles of hypothesis testing and statistical inference.
25. A sound methodology is essential for quality research.
26. I see the usefulness of research methodology in my professional life.

27. The coursework and training I have taken regarding educational research has been useful in helping me to understand and use RBK.
APPENDIX I

Scoring Sheet for Rating of Research Article Translations
<table>
<thead>
<tr>
<th>Points</th>
<th>0-1</th>
<th>0-3</th>
<th>0-4</th>
<th>0-4</th>
<th>0-4</th>
<th>0-10</th>
<th>0-12</th>
<th>0-2</th>
<th>0-7</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>Title</td>
<td>Abstract</td>
<td>Evidence</td>
<td>Method</td>
<td>Identify the consumer</td>
<td>Concluding Statements</td>
<td>Interpret findings</td>
<td>Procedures</td>
<td>Reference</td>
<td>Modification</td>
</tr>
</tbody>
</table>

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APPENDIX J

Scoring Sheet Key for Article Translations
Key

- **Title = 1**
  1. Completed correctly = +1
  2. Not addressed = 0

- **Abstract = 3 (purpose of the study)**
  1. Completed correctly = +4
  2. Not addressed = 0
  3. Not in own words = -1
  4. Too much detail = -1 (>1/4 pg.)
  5. Not enough detail = -1 (<1/4 pg.)

- **Evidence of Research = 4**
  1. Completed correctly = +4
  2. Not addressed = 0
  3. No statistics cited = -3
  4. Not enough detail = -1
  5. Too much detail = -2

- **Method = 4 (setting, sample, data)**
  1. Completed correctly = +4
  2. Not addressed = 0
  3. No sample described = -1
  4. No data collection described = -1
  5. Too much detail = -2 (>1/4 pg.)
  6. Not enough detail = -2 (<1/4 pg.)

- **Identification of consumers = 4 (subjects) characteristics, age, dis.**
  1. Completed correctly = +4
  2. Not addressed = 0
  3. Not enough detail = -2
  4. Did not identify degree and type of disability = -1
  5. Did not identify characteristics = -1

- **Concluding statements = 4**
  (Results/findings)
  1. Completed correctly = +4
  2. Not addressed = 0
  3. Not in own words = -1
4. Information belongs elsewhere = -1
5. To much detail = -2 (>1/4 pg.)
6. Not enough detail = -2 (<1/4 pg.)
7. Limitations note noted = -1

- **Interpret the findings = 10**
  1. Completed correctly = +10
  2. Not addressed = 0
  3. Inadequate translation = -8
  4. Not in own words = -2

- **Modifications = 6 (Discussion)**
  1. Completed correctly = +6
  2. Not addressed = 0
  3. Not applicable = -4
  4. Not enough detail = -1
  5. Did not address type and degree of disability = -1
  6. Did not address setting = -1

- **Reference = 2**
  1. Completed correctly = +2
  2. Not addressed = -2
  3. Not APA = -1

- **Procedures = 12**
  1. Completed correctly = +10
  2. Not addressed = 0
  3. Not specific = -2
  4. Not translated into step by step procedures = -6
  5. Not enough detail = -2 (<1/4 pg.)
  6. To much detail = -2 (>1/4 pg.)
  7. Not applicable = -2
APPENDIX K

Expert formative evaluation inquiry
Universal format form
Name: ______________ Position: __________

1. To determine the appropriateness of teaching research to practice skills.
2. To determine the clarity and appropriateness of the instructional materials used in this study.
3. To determine the appropriateness of the questionnaire used in this study.
4. To determine the appropriateness of the accuracy and currency of the content.

Materials:
The materials for this formative evaluation include a publication on a Universal Format for translating research, a pre-test/post-test questionnaire, and a training module on using the Universal Format. The Format includes a rationale for the use of research in practice for educators and provides a format for translating primary research. The questionnaire is designed to identify the educator attitudes, beliefs, and knowledge about the use of research-based knowledge. The training module is designed to assist University and College students in using the Universal Format.

Directions:
The questionnaire is very detailed so specific information will be used to revise the instructional materials and questionnaire for the purpose of increasing and understanding how teachers use research into practice and how to facilitate their acquisition of skills. Please use the following procedure:

1. Skim the attached pre-test/post-test questionnaire before you read the instructional materials. Note the kind of information you are asked to supply.
2. Read carefully through the Training module.
3. As you read these materials, annotate the pages with any comments, questions, or corrections.
4. Then, answer the following set of questions and provide written comments if possible. However, there may be some responses that you prefer to discuss with me personally rather than writing them. When you have finished, I will schedule a conference with you to discuss your responses. Thank you for assisting me. I appreciate your willingness to give
me both your expertise and your valuable personal time.

Instructions: Place written responses in the space below each question. Use the back of the page if necessary.

Objective 1: To determine the appropriateness of teaching research to practice skills.

1. Is teaching research to practice skills appropriate for teachers and pre-service teachers? If not, please indicate why.
   
   Yes □ No □

2. Is it reasonable to assume that basic research can be translated by teachers for application in classrooms?
   
   Yes □ No □

Objective 2: To determine the clarity and appropriateness of the instructional materials used in this study.

1. Is the training module appropriate for presenting information on the rationale, purpose, and method for using the Universal Format for translating research into practice?
   
   Yes □ No □
2. Is the instructional sequence for presenting information appropriate? If not, please indicate what changes should be made.

   Yes [ ] No [ ]

3. Have entry-level skills and abilities of teachers and pre-student teachers been considered sufficiently in the design of the training module?

   Yes [ ] No [ ]

4. Does the training module provide an appropriate amount of challenge to teachers and pre-student teachers? If not, what can be done to provide more challenge?

   Yes [ ] No [ ]

Objective 3: To determine the appropriateness of the questionnaires used in this study.

1. Do the questions in the pre-test/post-test questionnaire adequately assess attitudes, beliefs, and knowledge about using research-based knowledge? If not please suggest changes to make them more appropriate or note what information is missing.

   Yes [ ] No [ ]

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2. Is the pre-test/post-test questionnaire design appropriate according to survey procedures? If not please make suggestions or recommendations.

   Yes☐ No☐

Objective 4: To determine the appropriateness of the accuracy and currency of the content.

1. Are there any obvious gaps in the information provided in the training module or the Universal Format? Please note what information is missing.

   Yes☐ No☐

2. Is the vocabulary in the training module and the pre-test/post-test questionnaire clear? Underline unclear vocabulary on the materials.

   Yes☐ No☐

3. Can another instructor easily use these materials as printed? If not, what changes do you recommend to make them more usable?

   Practice simulations
   Yes☐ No☐
   Communication activities
   Yes☐ No☐
   Presentation assignments
   Yes☐ No☐
CONCLUDING STATEMENT

Please add any other comments or suggestions that would improve the training module and the pre-test/post-test questionnaire or any issues related to translating research into practice for educators.
APPENDIX L

Error Log Data
Error Log Data: Experimental Group, Article Translation 1 (Verbatim)

<table>
<thead>
<tr>
<th>STUDENT COMMENTS</th>
<th>STUDENT COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No problem</td>
<td>Organization-I found it confusing trying to follow the format. I didn’t see how following this format helped me understand the journal article better. It was just as difficult trying to figure this out as it was to read the original.</td>
</tr>
<tr>
<td>Very time consuming</td>
<td>Organizing all the information was a problem. The article seemed to be all jumbled up. All over the article, too much information was repeated. Read it over &amp; over till it made some kind of sense. Solution: not to do it at all.</td>
</tr>
<tr>
<td>Problem with how the research was structured done? (start, middle, end)</td>
<td>The way the article was written bugged me. For what this experiment was—they used so many words that, I was frustrated at first. It was difficult to pull out information. It was just confusing. When articles are written like this, I think it does make it difficult for a teacher to dig through this to make up a lesson plan.</td>
</tr>
<tr>
<td>Not used to reading/using/ translating research. Winged it, did my best. Do more of it, repetition</td>
<td>How much were we supposed to write on evidence of research? Do we talk about validity and reliability? Followed the sample in the...</td>
</tr>
<tr>
<td>Had problem trying to put in own words, mostly in summarizing abstract</td>
<td>original article. Didn’t find the “Id of consumers” helpful. If it was voluntary? Or not? -Wasn’t sure the purpose of this section. Would concluding statements make sense after abstract? Or before “interpret the findings”? It seemed like I was doing those two backwards.</td>
</tr>
<tr>
<td>Found information repetitious. When writing the interpreting the findings, I got very confused. Procedures seemed the same as above. The article restated the same information re: baseline, interventions, and results. I just interpreted the procedures and applied same to my situation. More information may be an article relevant to my situation. I could visualize what to do but getting sown on paper into my lesson plan was confusing.</td>
<td>Problem with Interpret the findings-didn’t know what part of research to get information. Did not clearly understand what sections were choose method over procedures. Simple clarification from ya.</td>
</tr>
<tr>
<td>Had trouble distinguishing the difference between Interpret the findings and procedures section-how to write up. Have done assignment similar to this before, so reading the research wasn’t that much trouble. Usually, it’s easier for me to read the discussions and/or results</td>
<td>I wasn’t sure what “evidence of research” meant. I felt I did not know how to identify the evidence.</td>
</tr>
</tbody>
</table>
first-then go back and read the article.

The wording of the article was a bit tough. It was so scientific sounding that I had to read and re-read several times to "get it". I finally did get it, and the inf. was good- gut never in a million years would I pick up that article and read it on my own. I did enjoy understanding the study itself, however.

I thought it was relatively easy, which actually concerned me. Many items were repeated. I felt like answers could be given w/o understanding the material. I did not feel like there was room for personalizing your work. A question/section on personal application should be added.

Generalizing-some of the questions-headings seemed hard to answer briefly. I guessed because of the complexity of the research. Make it lengthier to resolve it.

Error on Table 3, second page, 3rd line word "at" should be? I like the format

It was hard to analyze as I went along putting it all together. Was hard statistics harder to follow and lot of information-overwhelming. Wrote notes, as I read tried to summarize.

Error Log Data: Experimental Group, Article Translation 2 (Verbatim)

<table>
<thead>
<tr>
<th>STUDENT COMMENTS</th>
<th>STUDENT COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easier to do because I have experience now writing it in the format</td>
<td>Very long article-read it then read it again when writing. Misinterpreted some info in the article, had to go back and re-write. Had difficulty paying attention to content. Re-read. Solution would be shorter articles,</td>
</tr>
<tr>
<td>Still thinking concluding statement should be toward the end</td>
<td>This was easier because I understood more of what you were looking for than on the first one. However, the material is difficult to read. I just struggled.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>I was confused on locating some of the terminology (the variables, the type of study, etc). Because I am not a psychologist and I don’t use this terminology. I read &amp; re-read &amp; reread and finally got disgusted &amp; frustrated and wrote down what I “think” it might be (still have no clue!) Solution: become a psyche major?</td>
<td>Summarized article according to format. No problems noted.</td>
</tr>
<tr>
<td>This time I felt a little better following the example you gave last time. I was able to follow a model instead of shooting in the dark. I still had a hard time with the statistics on the charts. I used the written explanation to help. A possible solution would be to get some help to understand this better.</td>
<td>I found the length request difficult to satisfy. You want it shorter, but with more information.</td>
</tr>
<tr>
<td>Very good format. I need to maintain APA style.</td>
<td>I had to read the article several times to really get what was happening. I didn’t enjoy the article. It was hard for me to read because I wouldn’t use one of this type. I’m still having trouble distinguishing between Interpret the findings and procedures.</td>
</tr>
<tr>
<td>Method and interpret the findings order of writing is a problem. Not sure of what belongs in what area. Followed the format from first article along with</td>
<td>I was confused on where information was supposed to be put. Difference between method and interpret the findings-what identifies a consumer. Happened because</td>
</tr>
<tr>
<td>STUDENT COMMENTS</td>
<td>STUDENT COMMENTS</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>This was a short article. There wasn’t much info on the subject. Had difficulty understanding interpreting the findings as procedures.</td>
<td>Had more problems with actually breaking it down into steps this time, but partly of how it was written. Wasn’t as clear. I have to</td>
</tr>
<tr>
<td>and modifications. When I tried to decide where to put how I would use the info. In my class was where the problem occurred. A lot of this info. overlapped, I went ahead and put the into in and if I made a mistake, I’d find out later. I need to re-read the sample more.</td>
<td>review the stat’s carefully, this would be a problem for those not familiar with that. Still like the process great!</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>I didn’t have an article with an intervention, but I felt the info. from the article was important for the classroom.</td>
<td>Main are of concern is extracting procedures and interpreting findings-which is which? Making work in classroom sometimes not as easy as first appears.</td>
</tr>
<tr>
<td>Easier the third time around worked more on modifications takes more time but would be one of the most useful parts to read and utilized.</td>
<td>I am not sure whether I had an empirical article. They did have a methodology and procedures. I think doing six articles were exhausting.</td>
</tr>
<tr>
<td>Not used to reading/using/translating research. Winged it, did my best. Do more of it, repetition</td>
<td>After the article was selected, then I saw a lot of shortcomings that were in the article. No identifiable baseline. I resolved the problem by pulling together all the information that I could.</td>
</tr>
<tr>
<td>Even though my article was research based, (t had subjects, methods, graphs etc) I found nothing in it that I could translate into a class activity. I did not read the whole article before I chose it-I chose it based on the title (it sounded interesting) and the abstract. It wasn’t until I got it home that I realized I would have problems. I need to spend more time reading before I choose.</td>
<td>This article was much easier to do. I guess for several reasons- (a) I chose it myself, so if was a topic of interest to me. (b) The research was easier to read. Maybe because I’ve done this several times. I still need more clarification on Interpret the findings and procedures.</td>
</tr>
<tr>
<td>This 3rd article was easier to do as a whole. The problem was the article was a little</td>
<td>Much smoother this time an article I was very interested in. Was worried about the</td>
</tr>
<tr>
<td>unclear to me re: the intervention and treatment sections. Worked through and interpreted my way. The article could have been organized better.</td>
<td>research and usage in classroom. Problem was with step-by-step. Not exactly an easy to find assessment. Solution was to continue with the article finding out that it was a useful article for classroom.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>I felt more comfortable with the format and reading the article. I didn’t have any problems with interpreting the findings but again some of the questions seemed to be asking the same thing.</td>
<td>Was not sure if the research “question” was applied enough. I went ahead and developed the application but next time will look for a different article.</td>
</tr>
<tr>
<td>Finding a researched-based article was surprisingly easy. but don’t think I would ever go to the library on a regular basis to find more info. Maybe... Anyway, it was less painful than I expected. The articles themselves continued to be extremely difficult to read/interpret and seemed more intent on displaying the researcher’s knowledge/competence, than in explaining, in simpler terms, what the research was all about.</td>
<td></td>
</tr>
</tbody>
</table>

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References


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Office of Educational Research and Improvement (1988). *Incorporating research based teaching skills into a field based secondary teacher education program.* (Contract No. 400-85-1046, University of Wisconsin-Milwaukee, School of Education.). Washington, DC


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